

THE ECONOMIC HISTORY SOCIETY

Annual Conference

Royal Holloway, University of London

31 March – 2 April 2017

Programme including

New Researchers' Papers

&

Abstracts of the other Academic Papers

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Welcome to Royal Holloway, University of London

Welcome to Royal Holloway, University of London. The beautiful campus in Englefield Green dates back to 1886 and comprises 135 acres of historic and modern buildings and considerable green space. Royal Holloway was founded as a women's college by a generous bequest by Victorian entrepreneur Thomas Holloway. It became part of the University of London in 1900 and merged with Bedford College (another women's college, founded 1849) in the early 1980s. Men were first admitted to both Royal Holloway and Bedford in 1965.

The campus is situated 40 minutes by train from central London and on the doorstep of Windsor Great Park. Conference attendees are invited to visit the Grade 1 listed Founder's Building, particularly the gilded College chapel and the Picture Gallery, which houses an outstanding collection of Victorian art donated by Thomas Holloway.

At present the College is home to 21 Schools and Departments and approximately 7,100 undergraduate and 2,700 postgraduate students. The campus is undergoing its largest expansion since its founding in the 1880s; with a new library and student services complex, a new student housing complex, and a new science building currently under construction.

Economic history has long featured prominently in the College, with scholars housed in the Departments of Economics and History and in the School of Management.

Andrew Seltzer (Local Organiser)

Maureen Galbraith (Administrative Secretary, Economic History Society)

Summary Conference Programme

(See Contents for details of each session)

Friday, 31 March

0915-1045	EHS Publications Committee Meeting	Arts Building (F-001)
1045-1345	EHS Council Meeting	Arts Building (G-024)
1200-1700	Registration	Windsor Building Foyer
1400-1530	New Researchers' Session I	
I/A	<i>The Medieval Economy</i>	WIN0-02
I/B	<i>Eighteenth-Century Britain</i>	WIN0-03
I/C	<i>Transport, Communications and Settlement</i>	WIN0-04
I/D	<i>Nineteenth-Century Industry and Business</i>	WIN0-05
I/E	<i>Finance and Trade</i>	WIN1-02
I/F	<i>Human Capital and Individualism</i>	WIN1-03
I/G	<i>Crisis and De-industrialization</i>	WIN1-04
I/H	<i>Poverty, Inequality and Wealth</i>	WIN1-05
1530-1600	New Researchers' Poster Session	Windsor Building Foyer
1530-1600	Tea	Windsor Building Foyer
1600-1730	New Researchers' Session II	
II/A	<i>Medieval and Early Modern Work</i>	WIN0-02
II/B	<i>Trade and Commodities</i>	WIN0-03
II/C	<i>Business and Innovation</i>	WIN0-04
II/D	<i>Banks in Crisis</i>	WIN0-05
II/E	<i>Poverty and Welfare</i>	WIN1-02
II/F	<i>Investment and Fiscal Policy</i>	WIN1-03
II/G	<i>Twentieth-Century Industry</i>	WIN1-04
II/H	<i>Economic Growth and Development</i>	WIN1-05
1730-1830	Open meeting for women in economic history	WIN0-02
1815-1900	Council reception for new researchers & 1st time delegates	Crossland Suite
1900-2015	Dinner	Founder's Dining Hall
2030-2130	Plenary Lecture: Professor Tim Hatton <i>Heights and health since 1870: the long and the short of it</i>	Windsor Auditorium
2135-2145	Meeting of new researcher prize committee	WIN0-02
Bar available until late		Crossland Suite, Founder's Building

Saturday, 1 April

0800-0900	Breakfast	The Hub/Founder's Building
0800-0900	NR Poster Prize Committee	Windsor Building Foyer
0900-1030	Academic Session I	
I/A	<i>Nineteenth-Century Banking</i>	WIN0-02
I/B	<i>The Economy of Intoxicants in Early Modern England</i>	WIN0-03
I/C	<i>Industry and Enterprise in the Nineteenth Century</i>	WIN0-04
I/D	<i>Rural Inequality</i>	WIN0-05
I/E	<i>British Economy since 1945</i>	WIN1-02
I/F	<i>Development in the Middle East</i>	WIN1-03
I/G	<i>Development in South-East Asia</i>	WIN1-04
I/H	<i>Water and Public Health</i>	WIN1-05
1030-1100	New Researchers' Poster Session	Windsor Building Foyer

Conference Programme

1030-1100	Coffee	Windsor Building Foyer
1100-1230	Academic Session II	
II/A	<i>Building the Medieval Economy</i>	WIN0-02
II/B	<i>Religion and Economics</i>	WIN0-03
II/C	<i>Charity and Poor Relief</i>	WIN0-04
II/D	<i>Grain Markets</i>	WIN0-05
II/E	<i>History & Policy Brexit Panel</i>	WIN1-02
II/F	<i>Women and Entrepreneurship</i>	WIN1-03
II/G	<i>Finance in Latin America</i>	WIN1-04
II/H	<i>Migration</i>	WIN1-05
1230-1330	Lunch	Founder's Dining Hall
1345-1515	Academic Session III	
III/A	<i>Economic Shocks and Risk in Medieval Europe</i>	WIN0-02
III/B	<i>Leonard Schwarz: Work, Welfare and Wages in Early Modern England</i>	WIN0-03
III/C	<i>Infrastructure</i>	WIN0-04
III/D	<i>Rural Economy</i>	WIN0-05
III/E	<i>Industry</i>	WIN1-02
III/F	<i>Gender and Labour Markets</i>	WIN1-03
III/G	<i>Human Capital in Africa</i>	WIN1-04
III/H	<i>Institutions and Inequality</i>	WIN1-05
1515-1545	New Researchers' Poster Session	Windsor Building Foyer
1515-1545	Tea	Windsor Building Foyer
1545-1715	Academic Session IV	
IV/A	<i>Early Modern Accounting and Finance</i>	WIN0-02
IV/B	<i>The Occupational Structure of England and Wales, 1600-1911</i>	WIN0-03
IV/C	<i>Metropolis, Modernity and Decline: London in the Late Nineteenth Century</i>	WIN0-04
IV/D	<i>Conflict and Compromise</i>	WIN0-05
IV/E	<i>Economics and Politics</i>	WIN1-02
IV/F	<i>Regional Inequality</i>	WIN1-03
IV/G	<i>Long-run Perspectives</i>	WIN1-04
1730-1830	Annual General Meeting of the Economic History Society	WIN0-02
1930-2000	Conference Reception & Book Launch <i>(Kindly sponsored by: Department of Economics, RHUL and Boydell & Brewer)</i>	Picture Gallery, Founder's Building
2000-2200	Conference Dinner	Founder's Dining Hall
	Bar available until late	Crossland Suite, Founder's Building

Sunday, 2 April

0800-0900	Breakfast	The Hub/Founder's Building
0930-1130	Academic Session V	
V/A	<i>Slaves Serfs and Peasants</i>	WIN0-02
V/B	<i>Wealth, Poverty and Inequality in Pre-industrial Europe</i>	WIN0-03
V/C	<i>New Approaches to the History of Transport in England and Wales</i>	WIN0-04
V/D	<i>Banking and Finance</i>	WIN0-05
V/E	<i>Occupational Change from a Gendered Perspective (Women's Comm.)</i>	WIN1-02
V/F	<i>Finance in the Twentieth Century</i>	WIN1-03
V/G	<i>Height and Health</i>	WIN1-04
V/H	<i>Technology and Returns to Skill</i>	WIN1-05

Conference Programme

1130-1200	New Researchers' Poster Session	Windsor Building Foyer
1130-1200	Coffee	Windsor Building Foyer
1200-1315	Tawney Lecture: Professor Bishnupriya Gupta <i>Falling behind and catching up: India's transition from a colonial economy</i>	Windsor Auditorium
1315-1415	Lunch	Founder's Dining Hall
1315-1415	Publishing Your Work (session for new researchers)	WIN0-02
1415	Conference ends	

Brief guide to conference arrangements

The conference will take place at Royal Holloway, University of London. All residential accommodation, meetings and conference sessions will be located on the campus. A campus plan can be found on page xv.

Conference accommodation on campus

Ensuite and standard accommodation will be provided on campus:

- Single ensuite accommodation is located in Reid Hall and premium ensuite in Tuke Hall (see campus plan).
- Standard accommodation is located in the Founder's Building (see campus plan).

Accommodation check-in for residential delegates

Residential delegates should please check in as follows:

- Single ensuite and premium ensuite accommodation: The Hub Reception (open 24 hours).
- Standard accommodation – **Friday arrival:** Founder's Building at the Founder's reception on the west side (open 08:00 – 22:00) and after these hours at the Security Office on the east side. **Those arriving after 22:00 should contact security on 01784 443 063.**
- Standard accommodation – **Saturday arrival:** foyer, Windsor Building (open 08:00 – 18:00) and after these hours at the Security Office on the east side of the Founder's Building. **Those arriving after 22:00 should contact security on 01784 443 063.**

Keys will be available from 13:00 onwards. If you have any problems, please call the Customer Services Team (07:00 – 22:00 each day) on +44(0)1784 443 285.

There are no vacancies for those who have not booked accommodation in advance. It would be helpful for reception staff to be aware of any late arrivals in advance – please email TheHubAccommodation@rhul.ac.uk or call Customer Services and quote your conference's title (Economic History Society) or reference number (KX45207).

If you plan to arrive after 22:00 you should please, in advance, advise Maureen Galbraith (ehsocsec@arts.gla.ac.uk).

Accommodation check-out

It is important that all delegates staying in campus accommodation check out by 10:00 on the day of departure unless they have booked additional nights. Please return room key cards to the Founder's or Hub receptions to complete the check-out process. Key drop boxes outside Founder's Reception and the Hub Reception will be available for guests to deposit their keys.

Registration

Registration will take place between 12:00 and 17:00 in the foyer of the Windsor building (see campus plan). The registration desk will be staffed for the duration of the conference.

Alternative accommodation

Some local hotels are:

Great Fosters Hotel, Stroude Rd, Egham TW20 9UR (www.greatfosters.co.uk/)

The Runnymede-On-Thames. Windsor Rd, Egham TW20 0AG (www.runnymedehotel.com)

Savill Court, Wick Ln, Englefield Green, Windsor TW20 0XN (www.savillcourt.com/)

The Economic History Society does not necessarily endorse any of the hotels listed.

Guide to conference arrangements

Car parking

Free parking is available on campus, provided that your car registration details have been provided to the Conference office or Customer Service points. The online conference registration system has an option for car parking.

The campus plan shows a variety of car parks on site. For this conference, car parks 4 and 12 are recommended. Please note: no parking is allowed on the roads adjacent to the halls of residence; all parking must be legal or clamping will take place and fines may be incurred.

Book displays

Publishers' and booksellers' displays will be in the upper and lower foyers of the Windsor Building.

Meals and Morning Tea/Afternoon Coffee

Breakfast will be served at The Hub dining hall for residents staying in Tuke and Reid, and at the Founder's Dining Hall for guests staying in the Founder's Building. Lunches will be served in the Founder's Dining Hall. Teas and coffees will be available in the Windsor Building alongside the publisher exhibition and the new researcher poster displays.

Receptions and Bar

The Saturday evening reception will take place in the Picture Gallery and the bar will be located in the Crossland Suite – both of which are in the Founder's Building.

Meeting rooms for New Researchers, Academic Sessions etc

All meeting rooms will be located in the Windsor Building.

Internet access

Wi-Fi is available in buildings across campus. To connect, open an Internet Browser and follow the steps below:

- Select CampusNet Wi-Fi network.
- Two options - click on 'Guest User' option
- Terms of Use - confirm your acceptance
- Enter the User ID and Password (case sensitive) below:
User ID: **HISTORY2017**
Password: **RHULHISTORY2017**
- After a 60-second count down, you are asked to close down and re-open the browser: you will then be connected.

ATMs

Royal Holloway has an ATM at the Students Union Building and at the Windsor Building. Other ATMs can be found in Egham and at the BP garage on the A30 towards Egham.

Useful contacts

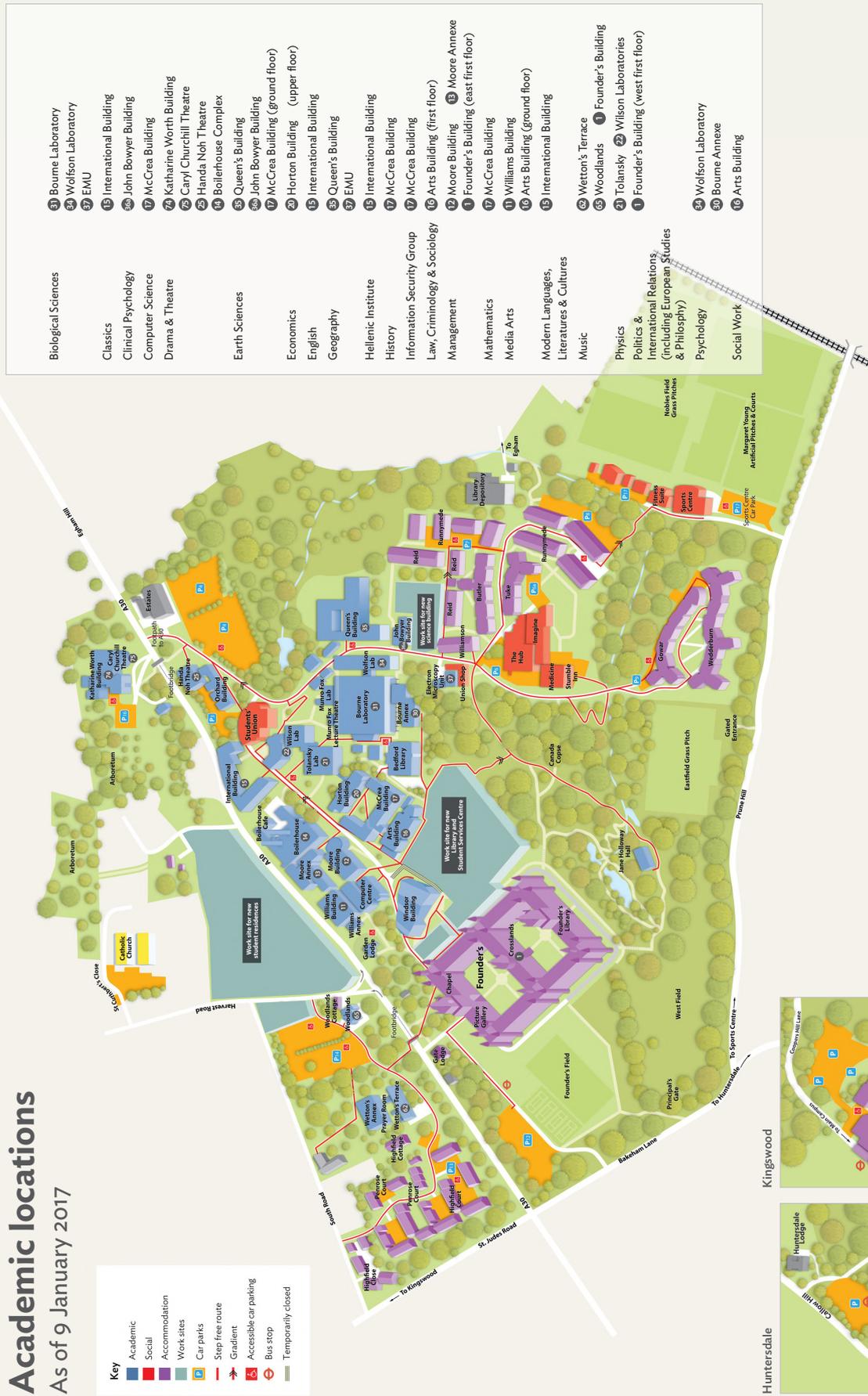
Conference office:	Tel: +44 (0)1784 443 045	Email: sales-office@rhul.ac.uk
Emergency:	Tel: +44 (0)1784 443 101	(RHUL security)
Maureen Galbraith	Tel: +44 (0)141 330 4662	Email: ehsocsec@arts.gla.ac.uk

Academic locations

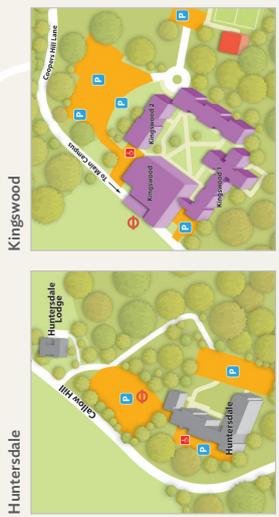
As of 9 January 2017

Key

- Academic
- Social
- Accommodation
- Work sites
- Car parks
- Step free route
- Gradient
- Accessible car parking
- Bus stop
- Temporarily closed



- Biological Sciences
 - 31 Bourne Laboratory
 - 32 Wolfson Laboratory
 - 37 EMU
- Classics
 - 18 International Building
- Clinical Psychology
 - 36 John Bowyer Building
- Computer Science
 - 17 McCrea Building
- Drama & Theatre
 - 74 Katharine Worth Building
 - 75 Caryl Churchill Theatre
 - 25 Harada Noh Theatre
 - 14 Boilerhouse Complex
- Earth Sciences
 - 35 Queen's Building
 - 36 John Bowyer Building
 - 17 McCrea Building (ground floor)
 - 20 Horton Building (upper floor)
 - 15 International Building
- Economics
 - 35 Queen's Building
 - 37 EMU
- English
 - 18 International Building
- Geography
 - 17 McCrea Building
 - 17 McCrea Building
- Hellenic Institute
 - 16 Arts Building (first floor)
- History
 - 12 Moore Building
 - 13 Moore Annexe
- Information Security Group
 - 12 Moore Building
- Law, Criminology & Sociology
 - 1 Founder's Building (east first floor)
 - 17 McCrea Building
- Management
 - 17 McCrea Building
- Mathematics
 - 11 Williams Building
 - 16 Arts Building (ground floor)
- Media Arts
 - 15 International Building
- Modern Languages, Literatures & Cultures
 - 69 Wetton's Terrace
 - 65 Woodlands
 - 1 Founder's Building
- Music
 - 2 Tolansky
 - 2 Wilson Laboratories
 - 1 Founder's Building (west first floor)
- Physics
 - 24 Wolfson Laboratory
 - 30 Bourne Annexe
- Politics & International Relations (including European Studies & Philosophy)
 - 16 Arts Building
- Psychology
 - 24 Wolfson Laboratory
 - 30 Bourne Annexe
 - 16 Arts Building
- Social Work
 - 24 Wolfson Laboratory
 - 30 Bourne Annexe
 - 16 Arts Building



*Please note: The ongoing development of our estate may result in further temporary work sites and alteration of routes and access points on campus. Where this is necessary, updates will be issued in advance to campus users.

A copy of this plan can be found at:
<https://www.royalholloway.ac.uk/aboutus/documents/pdf/locationmap/campusplan.pdf>

How to reach Royal Holloway

Comprehensive information on travel to Royal Holloway, as well as maps, can be found by following the links at: <https://www.royalholloway.ac.uk/aboutus/ourcampus/home.aspx>

By Road

Royal Holloway is on the A30, 19 miles from central London and about a mile south-west of the town of Egham. It is 2 miles from Junction 13 of the M25 (London Orbital). After leaving the motorway take the A30 west, following the signposts to Bagshot and Camberley (this is the Egham by-pass). At the first roundabout, take the second exit; at the second roundabout, again take the second exit and continue on the A30 up Egham Hill. The College is on the left at the top of the hill. The SAT NAV post code is TW20 0EX.

Bus / Coach Routes

There is a reasonable bus service from Heathrow Terminal 5 to Royal Holloway. The number 71 bus leaves from outside Terminal 5 and not from the Central Bus Station. If you arrive at another terminal, please follow flight connection signs for internal airport transfer to T5. From the Central Bus Station the number 441 bus also stops outside Royal Holloway but takes a slightly longer route. All buses run less frequently at weekends. Timetables for the 71 and 441 can be found at the following link: <http://www.surreycc.gov.uk/roads-and-transport/buses-and-trains/bus-timetables/staines,-chertsey-and-walton-bus-timetables>

By Rail

Egham is the nearest railway station to Royal Holloway. There are frequent services from London Waterloo to Egham (35-40 minutes); Woking to Egham (35 minutes, change at Weybridge) and Reading to Egham (40 minutes). Train links to the rest of the rail network are available via the London stations or Reading.

Please visit: <http://ojp.nationalrail.co.uk/service/planjourney/search> for timetables and journey planning options. There are usually taxis waiting outside the station which can take you to the campus. Alternatively, you could walk to Royal Holloway.

By foot from Egham Station

The campus is a 20-minute walk from Egham Station. The easy route, via the A30: Turn right out of the station along Station Road and walk about 100 yards to the junction and traffic lights; turn left at the junction and follow the road around to the large roundabout with a petrol station on the left; walk up Egham Hill (A30) and follow the footpath; the Royal Holloway entrance is on the left just after the second footbridge.

By Air

For those arriving at London Heathrow airport, we strongly recommend that you do not take the expensive black cabs, but use a local taxi firm. Windsor Cars offer competitive rates and can be pre-booked by calling +44(0)1753 677677, emailing bookings@windsorcars.com or via www.windsorcars.com. Card payments can be taken but there will be a transaction charge so cash is advised. *Please note: prices may differ if it is an immediate call out on arrival or you fail to mention the rates below.*

For journeys from London Heathrow or Gatwick to Royal Holloway, prices are:

- Heathrow Terminals 2, 3, 4 and 5: £21.00 cash or £23.00 card (call on landing, outside collection).
- Heathrow Terminals 2, 3, 4 and 5: £26.00 cash or £29.00 card (Meet and Greet at arrivals).
- London Gatwick: £60.00 cash and £66.00 card (Meet and Greet at arrivals).

For journeys from Royal Holloway to Heathrow and Gatwick, prices are:

- Royal Holloway to Heathrow: £16.00 cash or £18.00 card.
- Royal Holloway to Gatwick: £50.00 cash or £55.00 card.

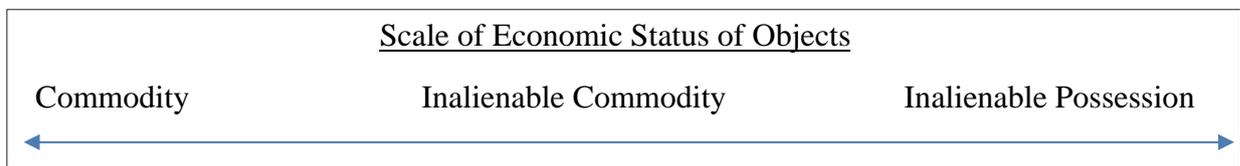
Please note that these prices are correct at present but you should confirm the price before booking as they may have changed. The taxi company will direct you to a pick-up point.

NEW RESEARCHER PAPERS

Processes of valuing and exchanging relics in Medieval Christianity, 800-1200

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Supervisors: Dr Claire Taylor & Dr Rob Lutton

The processes by which primary relics (the bodies and body-parts of Christian saints) were valued and by which their value changed throughout their lifespans are particularly complex. In part, this was because there were a variety of means and methods of moving relics. For the purposes of this paper, we shall examine only two in detail. The first, the *translatio*, involved the movement of relics on a permanent basis from one site to another. This could be by means of theft (*furta sacra*), within one church (intra-site translation), or from one town to another (regional). The second type of movement is the *delatio*, or the circular tour of relics. Each offers exposure of the relics to the different communities of the cult structure. When placed in these different social contexts, the relics participate in a variety of exchanges. These exchanges exist on a sliding economic scale from commodity to inalienable possession.



On one side of this scale, we understand how relics were bought, sold, and traded alongside other luxury commodities. On the other hand, relics remained resolutely tied, in most cases, to the lands associated with their cult. If they gained enough value, they could become inalienable possessions. To remove them from their original place would have been unthinkable for most of medieval society. And yet, removed they were, stolen by other monasteries for economic gain or hidden away in the face of an impending invasion, thereby removing them from exchanges in a different way. In such cases, however, the relics were still generally tied to the original community, either through the account of their theft, or because some relics would be left in the possession of the original owners. Relics were also imbued with the status of the saint, which still tied them to the places where the saint had spent their life – such places inevitably held a claim to some of the relics.

At different points in their lifespans, relics could be moved in the variety of ways mentioned above. During each type of movement, the relics were involved in different types of exchanges. Within these exchanges, their status as economic objects fluctuated between ‘commodity’ and ‘inalienable possession’, with the relics possessing qualities of both statuses. Relics might thus better be thought of as ‘inalienable commodities’, a term that encompasses both the sacred inalienability of the one side, and the transferability of the commodity.

I

Value is assigned in this essay through the twin criteria of exchangeability and utility. The combination of both is the defining characteristic of a commodity; it has long been argued by economic historians that relics were luxury commodities, and therefore that value can be detected through an examination of said criteria.¹ Historians have not yet, however, analysed how relics functioned in economic exchanges, nor why. Nor have they defined how relics had utility in medieval society. It would be next to impossible to establish the value of a set of relics in monetary terms. Likewise, it would be difficult to quantify value in terms of other

¹ Most notably Geary (1986), but also Defries (2004).

high-prestige goods. This is because relics were bodies, and as such, are not comparable in a quid-pro-quo way with other luxury commodities, as much as they have been studied as such by historians.² Instead, value can be determined through examining the exchanges in which relics participated. The value of relics is difficult to quantify, however, because most exchanges occurred not with the relics themselves, but instead with the cult or the community surrounding the saint. Items were given to the cult in exchange for miracles or prayer, and not generally in exchange for the relics themselves. Value would thus be determined by the utility of the saint, the efficacy of their miracles, and not the relics themselves. In determining exchange-value, money is a factor, as it was occasionally exchanged for the performance of a miracle. But this money was not exchanged for the relics themselves, and often, the amount given in return for the miracle is unclear.

One of the better ways to quantify value is to look at land exchanges and the use of relics for land management.³ It is here that relics demonstrated their utility and exchangeability in the clearest way. In exchange for the rights to cross lands, use them, or in exchange for the deeds and ownership of pieces of land, relics were taken by monastic communities to the sought lands and made to perform miracles. As this land was usually made in bequest to the monastery, in these instances relics were participating in a kind of gift-exchange system. Gift-exchange was only one economic exchange system in which relics functioned, however.⁴ Relics were also bought, sold, and traded, however, often again in exchange for an intangible or inalienable good. These exchanges could differ wildly dependent on social context, and as such, generalizations will be difficult to make.

Both exchangeability and utility were deeply impacted by the social context inhabited by the relics. This context included the political and social relations with nearby church and secular leaders, the relative size and structure of the cult, the number and relative prominence of other relics in the collection, amongst other aspects. For the most part, utility was measured by medieval hagiographers in the relics' ability to perform miracles. Relics which did not perform in this way could be 'demoted', removed from circulation, and even ritually humiliated.⁵ Relics were also used to swear oaths or to provide authority for transactions (including legal exchanges, such as the exchange of land, or political transactions, such as the affirmation of a secular leader in a position of power).

Exchange-value was also deeply impacted by the cult structure. The cult was comprised of the various social communities that surrounded the saints' relics, including the monastic community that held the relics, the people who lived under the saint's patrimony, and the devotees who went on pilgrimage to the relics. This cult, in the form of the monastic community, was responsible for assessing the economic value of the relics and contributing to that value in terms of investing donated funds to promote the relics, rehousing them in new reliquaries, or moving them to more prestigious locations in the church as their value increased. But this in no way denies the economic or social power attached to the other two communities of the cult who, with their devotional practices demonstrated the social value of the saint's powers, and who contributed economically by giving donations, either in the form of money or gifts in-kind.

Because relics had use-value and exchange-value of the type noted above, they were commodities. Indeed, this was proven by Patrick Geary and others in numerous studies, on the understanding that relics were bought, sold, traded and gifted as were other luxury commodities. In a way, however, such a supposition places too much emphasis on the relic as

² For bodily relics and reliquaries, see Bynum and Gerson (2008) and Hayes (2003).

³ See for instance Rosenwein (1989), Koziol (1992), and Craig (2015).

⁴ For gift-giving, see Mauss (1990) and Algazi (2003). For more on relics in gift-giving, see White (1988), Campbell (2008), and Silber (1995). For gift-giving in the medieval economy, see Curta (2006), Geary (1990), Geary (2003), and Gregory (1982).

⁵ Such was the case with the cult of St Lewinna, see Defries (2004). For more on the humiliation of relics, see Geary (1990) and Craig (2015).

an object, and renders too strongly the confluence between the relic and the reliquary. It must be remembered that a set of relics acted as a conduit for the saint's personality, and it was this saint, channelling the power of God, who performed miracles and opened up the profane medieval landscape to the sacred. Overemphasis on the 'object' of the relic over the 'person' of the relic mischaracterizes the relic, and allows for a fundamental misunderstanding of the relic as it would have been understood by medieval society.

II

If it has long been established that relics retained qualities of luxury commodities, then it remains to be explained how they also held qualities similar to inalienable possessions. Inalienable possessions are objects which are closely associated with the identity of a group or society, and are above economic exchange because, when given away, do not transfer ownership of that item away from the group.⁶ To define a set of relics as inalienable possessions depends primarily on the method of exchange. Relics could be bought and sold, but most circulated through either theft or in a gift-exchange system.⁷ This system began in the early medieval period, where relics were gifted by the Pope to rulers in *Francia*, with all the obligatory reciprocations that followed. In this exchange, the relics were seen as inalienable possessions of the Pope; they remained, in a social context, relics that belonged to the Pope, without that ownership being transferred to the new monastery.⁸ In these gift exchanges, the relics generate socio-economic hierarchies, wherein they provide both political and cosmological authority to the parties involved.

Moreover, because the saint was inalienably tied to the places in which they had lived and worked, the relics could participate in that connection if they continued to be held in those spaces. St Aethelthryth, who had lived and founded the abbey at Ely, and whose relics continued to be held there throughout the rest of the medieval period, was ultimately tied to that location. Her relics, although moved throughout the abbey at Ely in the seventh, tenth, and twelfth centuries, were never removed from that location. Historians might also look to place-names, dedications, and the patrimony of the saint to measure the connection of the saint to specific locations. The inalienability of relics manifested itself most clearly when relics were not moved (i.e. when they did not change social context). In such cases, the relics could achieve enough value within their community to become inalienable possessions.

III

It must be admitted, however, that relics were not always inalienable possessions. To argue so would lead to a logical tautology: that relics became inalienable simply because they were never moved, and that they were not moved because they were inalienable possessions. Ultimately, the movement of relics demonstrates the fluctuation in their socio-economic status, fluctuations that occurred because their value was dependent on the social context.

The problem that historians have in their attempt to examine how relics were exchanged and valued is their tendency to categorize relics based on one exchange. Relics participated in numerous exchanges throughout their lifespans, which could sometimes last for several hundred years. Examination of a set of relics throughout the entirety of that lifespan allows the historian to see that relics occasionally acted as alienable commodities, *and* that they could achieve a status as an inalienable possession. In so far as they held qualities of both statuses throughout other points in their lifespan, relics might thus be considered 'inalienable commodities'. This term refers to objects that have both the inalienable quality of the sacred, and the alienable quality of the commodity. Relics act as

⁶ Weiner (1992), Godelier (2004), and Theuws (2004).

⁷ Geary (1990).

⁸ Geary (1986), pp.182-183.

such because they are a conduit for the sacred through the person of the saint, and because they can behave in transactions like other luxury commodities.⁹

The theft of relics provides one example where a set of relics could act as an inalienable commodity. When St Foy's relics were stolen from Agen and brought to Conques in 866, they were hidden from view and the Agenais in pursuit of the relics were 'blind' to them when found. During the journey, however, the relics revealed themselves on at least one occasion by performing miracles. The juxtaposition of the relic as object and the relic as a conduit for the sacred would suggest that here the relics are inalienable commodities, and possessed of both attributes of commodities and of inalienable possessions. Similarly, the relics of St Lewinna, when stolen from Sussex and brought to Bergues in 1058, were placed in a bag, and there are no mentions that anyone outside of the thief knew the exact contents of the bag. And yet the sailors who transported the relics refused, for an unknown reason, to abandon the bag when the thief is parted from it, and when it ends up in a merchants house in Flanders, where the monk has to beg for its return, the wife keeps everything else except for the bag, which had no value to her but was above all other objects to the monk. Moreover, because the relics were transported alongside other goods and along known trading routes, they more fully represent the two economic functions encapsulated by the term 'inalienable commodity'.

IV

Because value is measured by the utility and exchangeability of the relics, but tempered by the relics' ability to act as a conduit for the sacred, relics effectively functioned as inalienable commodities throughout the middle ages in Western Europe. This status can be measured through an examination of the various exchanges that occurred throughout the lifespan of the relic. The movement of medieval relics allowed for increased exchanges to occur, which subsequently increased the value of the relics. When relics were moved regionally, they were transferred to a new social context and given the opportunity to participate with different levels of their social community. In so doing, the relic could simultaneously inhabit different economic categories, behaving in some cases like other luxury commodities, and in other cases like inalienable possessions. In their movement, either through the tour or the *translatio*, the relic most clearly demonstrates these fluctuations in status. Examination of the movement of medieval relics therefore offers the opportunity for the historian to analyse the types of exchanges in which medieval relics participated and the effect of those exchanges of the socio-economic value of the relics.

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⁹ Theuws (2004), p.129; see also Ferry (2002).

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Commercial expediency, financial convenience and political aspiration: the early success of the gold florin, 1260s-1280s

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Supervisors: Dr Georg Christ & Dr Paul Oldfield

The Florentine gold florin represented the starting point of a new era of gold circulation in thirteenth-century Europe and the Mediterranean. Minted in Florence apparently in 1252, the florin rapidly became the dominant currency in the international monetary system of the time, with no peers among the debased Byzantine and Arabic gold coins in circulation at the time. Describing the early life of this coin, especially in the early decades following its first minting, is however a complex task.

Numismatic evidence for the period 1260s-80s is hard to find. The only coin hoard available for this period seems to be the one found in Pisa in 1925, presumably buried by 1266.¹⁰ Although Florentine florins appear to circulate along with other international gold coins, this finding alone is inadequate to assess the effective spread of the Florentine money, and the reasons behind its diffusion.¹¹ According to Spufford (2006), also written evidence from the few contemporary books of account of the Florentine mercantile companies, turns out to be ‘tantalisingly ambiguous’ as they do not always clarify what kind of florin (silver or gold) was used.

The dominance of economic theories that characterizes the historiography on the origins and the early life of the florin, moreover, makes the whole enquiry even more complex. Nowadays, economic historians such as Lane and Mueller (1985), Spufford (1988; 2006), and Goldthwaite (2009), all agree that its success depended mainly – if not only – on the contemporary need of a new gold monetary standard with an immutable intrinsic value, in response to the impressive revival of the western commerce in the thirteenth century. This interpretation, originally proposed by Bloch (1933) and later developed by Lopez (1953), Cipolla (1958) and Walker (1983), seems to have prevented attempts to move away from this economic explanation, which remains unsatisfactory as it refers to the success of gold coins rather than the success of the florin specifically. Yet the broad acceptance of this idea has hitherto inhibited historians from analysing the full range of elements that contributed to the wide success of the florin, together with the multiple facets of its broad circulation.

However, the full understanding of the success of this currency shall not to be exhausted within the limits and the monetary needs of the ‘Commercial Revolution’. Studying the origin of money, both Grierson (1977) and Ingham (2004) agree that it was administrative and social reasons that determined the nature and thus arguably the success of coins in a context where many actors experimented with gold coins, and they imply an exceptional indifference to purely economic considerations. According to Spufford (1988), religious and political factors used to have much greater effects on the movements of bullion ‘in the short run’ than trade balances.

By focusing on the florin within the political and historical background in which it was conceived, I will argue that a major factor in its early success was its adoption by the financial systems of foreign kingdoms. Through the analysis of the surviving registers of the Angevin Chancery under the reign of Charles I of Anjou king of Sicily (1266-85), I will demonstrate that by the end of the 1270s, the Florentine florin was already so deeply rooted in the circulation of the Kingdom to perform as a full-fledged local monetary standard on a level

¹⁰ Cf. Baldassarri, Burrese 2000.

¹¹ As it stands nowadays, the hoard is incomplete, since it was deprived of three-quarters of its original composition when discovered; cf. Baldassarri, Burrese 2000.

with domestic gold currencies. Both as money of account and actual coin, the florin was intended to serve the administrative needs of the Crown, which included the tax system, the payments to the military personnel, and those local affairs involving the Crown.

This is an additional and extremely important factor of the early success of the florin, especially if we consider that firstly, the Angevin kingdom already had its local gold coins by that time; secondly, Florence had no direct political control over that part of Italy in those years; and thirdly, that occurred well before the affirmation of the Florentine merchants as the bankers of the Crown.

On 26 February 1266, Charles of Anjou became king of Sicily after having defeated Manfred in the battle of Benevento. The first mention of the existence of royal archives under the Angevin dynasty dates back to 1269.¹² Over the centuries, this documentation suffered several losses. The most dramatic occurred in September 1943, when the German army set fire to the building hosting the Angevine archives. Under the direction of Filangeri, the Neapolitan archivists managed to reconstruct part of the lost material. From 1950 to the present time, 50 volumes have been published with the title *I Registri della Cancelleria Angioina* and among them, the first twenty-seven deal with the reign of Charles of Anjou (1266-85). The use of the gold florin of Florence, as it can be gathered from the analysis of these volumes, appears to be multifaceted.

A first kind of documentation that demonstrates the extent to which Florentine gold florins were already well-established within the royal fiscal system, is the so-called *apodixa* (pl. *apodixe*). This was a sort of receipt that the royal treasuries had to release for any deposit of money they had received.¹³ Each *apodixa* had to specify which currencies were effectively paid, how much of each denomination, and the reasons for that income. Hence, those *apodixe* provide us with a real sense of the effective monetary circulation within the Kingdom of Sicily at the time of Charles I.

Due to the dramatic losses of the past century, the bulk of this written material belongs mainly to the period 1277-78, for which there is a whole series of fiscal sources from September 1277 to August 1278.¹⁴ Nevertheless, fragments of *apodixe* from the late 1260s, clearly illustrate that Florentine florins were already being deposited to the royal *Camera*, created to administer the wealth of the Crown.

On 10 July and 3 August 1269 respectively, the agents of Bartolomeo of Sorrento, the justiciar of Abruzzo, paid 100 gold florins to Nicola Buccelli, and another undefined quantity of florins corresponding to 11 ounces of gold, to Pietro Farinelli, both representing the royal *Camera*.¹⁵ An additional deposit of 100 gold florins from the justiciarship of Abruzzo seems to have occurred on 14 February 1270.¹⁶

Unfortunately, it is not possible to know what generated the collection and the deposit of florins in these cases. However, it is interesting to note that Florentine florins were already being recorded alongside the local gold *augustales*, normally exceeding the amount of florins paid. That might be suggesting that the florin had not yet won the competition of the local gold currencies in this early stage of its life. The contemporary monetary reform of Charles would confirm this hypothesis. In 1266, the king ordered the production of a new gold coin called the *reale*, which was minted with many of the features of the gold *augustalis* of Frederick II Hohenstaufen rather than emulating the Florentine money.¹⁷

Nevertheless, new elements come to light considering the following table that lists the *apodixe* for the period September 1276-February 1277.

¹² Cf. *I Registri della Cancelleria Angioina* (henceforth *RCA*) vol. XXXVII.

¹³ *RCA XIX*, p.89, n. 61.

¹⁴ Cf. *RCA XXXVII*, p.19ff.

¹⁵ *RCA XLII*, p.37, n. 72 and p.35, n. 63.

¹⁶ *RCA XLII*, p.42, n. 92.

¹⁷ Cf. *MEC 14*, pp.194-206 and Kowalski 1974.

N.	Date	Depositor(s)	Money	Reason(s)
1 ¹⁸	26 Sept. 1276	Guglielmo Buccelli, royal official	4800 augustales 1000 florins 1983 ounces of taris	-
2 ¹⁹	20 Oct. 1276	Gautier de Sommereuse, justiciar	2000 florins	<i>Subventio generalis</i>
3 ²⁰	22 Oct. 1276	Guillaume de Aubervilliers, justiciar	44 augustales 1445 florins	<i>Subventio generalis</i> and other revenues
4 ²¹	2 Nov. 1276	Russo Cafaro, royal official	1500 florins	Revenues
5 ²²	3 Nov. 1276	Federico de Afflicto, royal official	80 augustales 1295 florins 21 ounces of taris	Revenues
6 ²³	13 Dec. 1276	Herbert d'Orleans, justiciar	104 augustales 2730 florins	<i>Subventio generalis</i>
7 ²⁴	17 Feb. 1277	Guglielmo Buccelli, royal official	1595 ounces of augustales, 1405 ounces of florins	-

The first striking element is the quantity of gold florins here recorded, which far outweighs the amounts in the early documentation. This aspect is even more interesting as these sources are all concentrated in only six months, from September 1276 to February 1277. Since five gold florins were worth one gold ounce, thousands of gold florins were filling the coffers of the *Regno* in a short period of time and this is indeed symptomatic of an enhanced presence of that currency in Sicily and South Italy by that time.

The second interesting aspect is related to the nature of these incomes. It is expressly reported that many of these gold florins had been collected by the *Subventio generalis*, a direct tax related to the movable goods and the revenues of all laymen, with the exclusion of the very poor. Since we do not possess any documentation referring to the collection of this tax, there is no way of knowing whether gold florins were actually paid at the local level. However, those *apodixe* leave little doubt that gold florins were effectively deposited to the royal *Camera*. It is also worth noting that Florentine florins were also collected through other taxes, as the ones on the exportation of wheat.²⁵

All these documents clearly illustrate that florins were deeply embedded in the accounting system of the reign of Charles I; and specifically, the higher volume recorded in these years suggests a whole new role for that coin within the borders of the Angevin kingdom, employed on the same scale as the local gold currencies. Further evidence comes from the analysis of the payments to the military personnel of the Kingdom.

On 6th March 1278, Iohanne de Tilio, Petro de Angicourt and their troops, complained about the delay in payments for their military services in the fortress of Lucera. Charles

¹⁸ RCA XVII, p.125, n. 320.

¹⁹ RCA XVII, p.125, n. 321.

²⁰ RCA XVII, p.126, n. 323.

²¹ RCA XVII, p.127, n. 326.

²² RCA XVII, p.127, n. 327.

²³ RCA XVII, p.128, n. 328.

²⁴ RCA XVII, p.129, n. 331.

²⁵ RCA XVII, p.372, n. 142.

ordered the officiating justiciar of Capitanate to pay their salaries expressly in gold florins.²⁶ Similarly, on 3rd April, Guglielmo de Malassisia claimed the salary for himself and his twenty mercenaries responsible for the defence of the northern borders of the justiciarship of Terra di Lavoro. Also in this situation, gold florins were paid on the direct orders of the king.²⁷ Contemporary documentation seems to suggest that a similar preference for gold florins also characterized those payments to the troops fighting outside the Kingdom.²⁸

The fact that all those payments occurred expressly at the king's request, is probably the most original aspects to take into consideration. By that time, Sicily and South Italy already owned their gold currencies. Since minting coins in medieval times did involve a full range of costs for the royal mint, which vary from the wages of the worker to the production costs, it remains unclear why Charles expressly opted for a foreign coin as means of payments on so many occasions.

That could have been related to the contemporary scarcity of the other domestic gold coins. On 4th June 1278, while instructing the royal minters for a correct reproduction of the images on the two sides of his new gold *carlino*, the king ordered the speeding up of production and to strike the new money in a 'convenient and abundant' quantity as to cover all the costs of his troops and any expenditure from other officials.²⁹ Such eagerness might hint at the contemporary inadequacy of the existing stock of local gold currencies at the king's disposal to meet the needs of the war market. However, the research is underway.

A final interesting case study confirming the embeddedness of the florin in the Angevin Kingdom, refers to certain local affairs of the Crown not related either to the fiscal and the military business: the construction of the abbey of Santa Maria della Vittoria in Scurcola Marsicana (Abruzzo), built in 1274-84. It was the Crown that covered all the building costs and referring to Egidi (1909-10), it seems that only gold florins and gold *carlini* were sent by the royal treasurers on behalf of the Angevin Crown, to cover any expense.³⁰ In November 1278, Charles asked the royal treasures to send to the abbot Bartolomeo 24 ounces and 12 taris of gold but in gold florins for the rent and the cloths of twenty workers.³¹

A possible explanation for the use of gold florins in such a restricted and local context, could be found in the direct involvement of the Angevin monarchy, which might have been so well accustomed to the presence of the florin that turned it into a habitual means of payment. By the end of the 1270s, therefore, the Florentine florin would have been such a strong presence in the economy of the Angevin Crown to trickle down also into the local economy through the channel of the royal expenditure. This last case study would then confirm the idea of a progressive expansion of the gold florin in all the stages of the monetary circulation of the Kingdom.

To conclude, this brief and initial analysis has suggested that the florin was struck not only to cater to the need for a more portable currency in international commerce, but also for the public finance of foreign kingdoms. This was arguably as important a reason for its success, why it gained such a wide circulation. The fiscal-administrative practices of the reign of Charles I of Anjou were thus instrumental for its early success. The analysis of the surviving registers of the Angevin Chancery, has shown that florins were mainly employed in local taxation, used as means of payment for the wages of the military personnel and in local affairs involving the Crown. Florins were circulating from hand to hand among the royal officials, accepted and paid by the royal *Camera* and on certain occasions expressly used on request of the Crown. Further research will aim to understand why the Angevin monarchy did

²⁶ *RCA XVIII*, p.286, n. 598.

²⁷ *RCA XVIII*, p.128, n. 259.

²⁸ *RCA XXV*, p.151, n. 17 and p.169, n. 133; *RCA XIX*, p.147, n. 162.

²⁹ *RCA XIX*, p.217-218, n. 363.

³⁰ Cf. Egidi 1909, p.759; I still need to check the original documentation the author refers.

³¹ *RCA XXI*, p.201, n. 24.

turn so heavily to the florin and particularly, whether the Crown was 'pulling' the coin, rather than 'being pulled' by its contemporary success.

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***Resicum* – A probability of *fortuna* and *periculum*: The development of risk into a contractual commodity in the medieval Mediterranean, 1147-1431**

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On 26 March, 1392, Nicholicus Galamany, a merchant from Genoa, insured 254 sacks of wool worth 2,000 lire for the merchant Raymundo de Querio.³² In order to determine the price of the insurance, both the chance of a fortunate outcome (*fortuna*) and the danger of loss (*periculis*) needed to be considered. The price that reflected the estimated value of the chances of either a fortunate outcome or a mishap was given the name *resicum*. The contract between Galamany and de Querio was a typical insurance contract, in which, as James Franklin has defined insurance, “the risk of misfortune to a thing is something that can be sold independently of the thing itself”.³³ Though historians disagree about when the first insurance contract appeared, there is a general consensus that we can isolate its origins to between 1328 in Marseille (noted by Lorraine Daston) and 1350 in Palermo (argued by Florence Edler De Roover).³⁴

From the late nineteenth century until today, the study of maritime insurance has been analysed from legal and economic perspectives. Most arguments rely on the assumption that a Christian mentality, encompassing the moral condemnation of certain economic practices, can help explain the late appearance of insurance. Lucien Febvre describes insurance as the manifestation of a transfer of trust from heaven to earth – one that responded to a new need for security.³⁵ This need for security, Febvre argued, emerged in parallel with what Max Weber called capitalist mentality.³⁶ Legal historians have traced the evolution of the insurance contract, and explained its emergence as the result of the attempts of notaries and jurists to circumvent the usury prohibition.³⁷ Insurance, unlike usury, did not involve loans. Thus the premium was, contrary to interest received for the extension of a loan, not in conflict with canon law. Economic historians have argued that the contract was invented by sedentary merchants who needed a new contractual form to protect their financial investments.³⁸ Yet understanding the history of risk commodification in the middle ages requires us to imagine actors who did not intend to rid themselves of trust in God and his providence, or to make trade as safe and profitable as possible with insurance. Merchants had long lived in a world full of risks and they had long known how to incorporate the probability of calamity into their exchanges.³⁹ They had learned to safeguard profits by spreading risks among the community of traders, and thereby insuring one another. As Quentin Van Doosselaere has shown,

³² Garcia i Sanz & Ferrer i Mallol (1983), Doc. 89 (1392).

³³ Franklin (2001), 274.

³⁴ Bruno Dini, who provided the most recent synopsis about medieval maritime insurance, identifies the first insurance contract in 1320 Tuscany; Dini (1999), 1691; Daston (1988), 118, citing Ball, (1977), 180; for Federigo Melis in Genoa in 1343, (1975), xxii; for Gordon A. McLean it was in Genoa around 1347, (1938), 210; Léone Liagre-De Sturler follows McLean with Genoa in 1347, (1969), xcvi; and for Florence Edler De Roover in Palermo in 1350 (1945), 183; for Giuseppe Stefani, in Venice in 1336, (1958), 73.

³⁵ Febvre (1962).

³⁶ Ibid.

³⁷ See footnote one in De Roover (1945), 172, for a comprehensive summary of the early historiography and debate on the origins of third party insurance.

³⁸ De Roover (1945), 180. In the late 1950s and 1960s, French scholars combined the legal and economic perspectives: Boiteux (1968); Heers (1959). The most recent treatment of the subject has been provided by articles, taking an institutional approach, collected in Leonard (2016).

³⁹ McCormick (2001) argues that merchants came to live in the world of the probable especially after the collapse of the ancient economy when trade was no longer state-subsidized, 568.

insurance remained a small business into the early modern period.⁴⁰ It might not even have served to give a sense of greater security, but, as he argues, might have instead been used to foster clan alliances.⁴¹ The question, then, is why did a legal document that crystallizes risk as a tradeable commodity appear first only in the middle of the fourteenth century?

Examining the development of risk as a saleable commodity in both Mediterranean commercial contracts from Genoa and Barcelona (1147-1397), and using theoretical writings from the late thirteenth century, I argue that the emergence of the concept of risk as tradeable commodity prior to the existence of insurance companies, mathematics of probability, and ‘capitalism’, has to be understood alongside broader changes in the ideal of justice within economic thought.⁴² Risk did not appear as tradeable commodity because merchants needed more safety or because they sought to circumvent a Christian mentality that hindered the development of commerce; it developed because the guardians of the legal system – notaries, lawyers and theologians – began to deem previously taboo elements such as risk, doubt, probabilities and proportions in commercial agreements as not only just but even beneficial to the common good.

Medieval people disliked elements such as doubt, probability, approximation, value relativity, multiplication, and the desire for profit, because they seemed to contradict the numerically equal balance according to which the Christian God ordered nature and men. Arithmetical inequality, as Joel Kaye explains, “represents an imbalance (*superhabundantia*) which is at the same time a violation of justice, a violation of the natural order, and a sin against divine and divinely mandated order”.⁴³ All aleatory contracts rely on a probabilistic and proportionate equality, and thus were incompatible with the Christian ideal of an arithmetic, numerically equal balance. From 1250 onward, with the commercialization of one Mediterranean city after another, economic transactions that involved and necessitated proportionate and probabilistic equalities became inevitable. At the end of the thirteenth century, more than half a century before insurance contracts existed, we find the principles of insurance – the selling and buying of probabilistic prizes – explained in a scholastic treatise written by the Franciscan theologian Peter of John Olivi (1247-98). Olivi argues that the priceable value of probability (*appreciabilis valor probabilitatis*) could legitimately be estimated because the future cause of each good, including the one of monetary capital, had been implanted in its materiality from the beginning of its existence.⁴⁴ Merchants’ knowledge of risks, their skill in determining the price of these risks – a skill acquired by experience – came to be legally recognized.

I argue that the insurance contract – the possibility to sell risk as commodity – became possible and developed alongside this change in the ideal of economic thought from a stable, static and fixed perception of the realities of the marketplace towards the integration of proportionate and probabilistic factors into the emerging legal system. In the earliest contracts involving a transfer of risk exchange, risk did not figure as a commodity with a value which could be monetarily measured. Instead, the transference was expressed with a conditional clause that invalidated the content of the contract in case of an unfortunate outcome during the

⁴⁰ Doosselaere (2008).

⁴¹ Doosselaere (2014).

⁴² For the argument about the change in economic thought from 1250-1375, see Kaye (2015). This paper includes an analysis of contracts from two sets of printed editions, and one register comprising unprinted insurance contracts from the state archive of Genoa. For contracts from Barcelona, see Ferrer i Mallol & Garcia i Sanz (1983). For contracts from Genoa, see Doehaerd (1941) and Lieagre-De Sturler (1969). Genoa and Barcelona are good cases for the study of insurance contracts, not only because they were among the most important trade cities during the middle ages but also because the term *resicum*, which later came to denote risk as a tradeable commodity, was used by both Genoese and Barcelonese merchants in the same way – in spite of formal differences in each city’s insurance contracts.

⁴³ Kaye (2015), 25.

⁴⁴ Olivi, *Tractatus*, 42, 216.

overseas venture.⁴⁵ Risk did not figure as a commodity with a value which could be monetarily measured. In the middle of the thirteenth century, notaries began to conceptualize the transference of risk with an explicit formula, stipulating that a loan is given “at the fortune and risk of the said ship and goods” (*ad fortunam et risicum dicte navis et rerum*).⁴⁶ Some formulas included a more detailed description of the transfer of risk. On 13 August, 1397, a loan between two Sicilian merchants is given “according to the custom and the people of the sea [this referred to the incident of pirates], and to your risk, danger and fortune, (*risicum, periculum et fortunam*) so that God may safe the said ship, [...]”.⁴⁷ The change from an implicit to an explicit formula occurs around the same time when legal writers such as Peter of John Olivi not only accepted but formulated the practice of selling and buying risk in scholastic terms.

Because of the close connection between the terms *resicum*, *fortuna* and *periculum*, scholars disagree over whether the term *resicum* had a distinct juridical meaning or if it simply fulfilled a symbolic function together with the words *fortunam* and *periculum*.⁴⁸ Sylvain Piron instead argues that the term came to denote the assumption of risk, and hence stood for a juridical concept.⁴⁹ Piron assumes an Arabic derivation. In Arabic, the term *rizq* referred to gifts of God, a favourable hazard, chance, and estimation by eye.⁵⁰ The Arabic word *rizq*, I argue further, provided Mediterranean notaries with a vocabulary to express risk as a commodity, a concept absent from both Latin contractual language and theoretical writings. *Fortuna* referred to divine providence and expressed the hope for a favourable outcome to the journey.⁵¹ *Periculum* denoted the fortuitous damage that an insurer was responsible to cover.⁵² The selling and buying of risk as a separate entity, however, needed a term which considered both the chance for fortuitous damage and the God-given fortune of the overseas venture. The denotation of such a probable value was the meaning that the term *resicum* assumed in insurance contracts. On 27 July, 1397, the three insurers del Negro, Gambarini, and de Brasselis insured (*attendentes*) Lucham de Sera “up until the quantity for which we took on the risk (*risicum*) of said goods”.⁵³ Even though there was no uniformity in the use of the term *resicum* for a long time, it gradually acquired a distinct meaning from the words *periculum* and *fortuna* in insurance contracts. In a Genoese register which exclusively contains insurance contracts from 1430-1, the term *resicum* appears independent from *periculum* and *fortuna* in each of the 196 readable contracts.⁵⁴ There, it signified risk commodity, the value of the probability for both *periculum* and *fortuna*.

Conclusion

This paper has shown that risk commodity as it appears in insurance contracts was neither developed as an evasion of the usury prohibition, nor as the invention of merchants who needed protection for their financial investments. Notaries who drafted contracts and merchants who could choose to use them did not invent insurance, knowing that risk would

⁴⁵ Garcia i Sanz & Ferrer i Mallol (1983), doc. 1 (1147).

⁴⁶ Doehaerd, *Relations Commerciales (1200-1320)*, vol 2, doc. 819 (1253), doc. 1172 (1262). The same explicit formula with the term *resicum* appears in Barcelona in only two contracts prior to the fourteenth century, see Garcia i Sanz & Ferrer i Mallol (1983) doc. 18 (1295), doc. 22 (1295). The formula appears frequently after the turn from the thirteenth to the fourteenth century: doc. 32 (1317), doc. 45 (1340), doc. 50 (1347), doc. 51 (1347), doc. 72 (1387), doc. 78 (1388), doc. 84 (1388), doc. 85 (1390), doc. 111 (1399), doc. 113 (1399), doc. 114 (1399), doc. 115 (1400).

⁴⁷ “ad usum maris et gentium et vestry risicum, periculum et fortunam, prout dominus Deus salvaverit dictam barcham [...],” Garcia i Sanz & Ferrer i Mallol (1983), doc. 94 (1397).

⁴⁸ A proponent of the latter is Jehel (2002).

⁴⁹ Piron (2004), 59

⁵⁰ Piron (2004), 68.

⁵¹ Piron (2004), 66.

⁵² Piron (2004), 70, cites Martin Pennitz (2000).

⁵³ “[...] scilicet quilibet nostrum usque ad quantitatem pro qua accepit risicum dictarum rerum.” Garcia i Sanz & Ferrer i Mallol (1983), doc. 93 (1397).

⁵⁴ AsG, *Notai Antichi* 666/III (1430-1).

later become a powerful commodity with which insurance agents constructed neoliberal societies.⁵⁵ Medieval commercial contracts were not developed by notaries and merchants who worked towards the creation of capitalist institutions. For a long time, insurance remained a small business.

Based on Joel Kaye's recent study on notions of balance in medieval economic thought, I have argued that the emergence of risk as a commodity in contracts must be understood as a manifestation of the changing ideal of economic justice. Scholastic thinkers, popes and theologians began to loosen the strict boundaries of arithmetic equality as codified in canon law. They began to view elements of commercial agreements that had once been mistrusted – elements such as risk and doubt, probabilities and proportions – to be beneficial measures for the wealth of their respective cities. This gradual acceptance and integration of a different sense of economic exchange justice is reflected in the development of formulas of risk transference contracts. The Arabic term *resicum* came to express a new value, quantified probability. It synthesized the chance for mishap (*periculum*) and success of a merchant's financial investment (*fortuna*).

In further research on the beginnings of insurance, I will consider how the possibility of selling and buying risk independent from the commodity itself altered the relationship and understanding of merchants in regards to the materiality of their goods. Did the idea that a good possessed insecurity that can be sold independently from itself contribute to the development of a consumer mentality which requires people discard and buy goods anew? The inclusion of more contracts from various Mediterranean cities will allow me to consider whether a Mediterranean unity existed through a shared legal culture in which the possibility of selling and buying risk might have started to shape people's consumption behaviour.

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Child labour and the textile business at the Foundling Hospital, 1758-72

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The Foundling Hospital was the only charity which took in and supported abandoned infants in Britain during the eighteenth century. The first children were accepted in 1741 and it was quickly recognized that the Hospital provided a valuable public service. From 2 June 1756 to 25 March 1760 Parliament provided funds for the Hospital to accept all of the 14,934 children aged 12 months or under presented to it. This was the period of the 'General Reception'. The Hospital expanded to cope with the numbers and branch hospitals were set up outside London. The branch in Ackworth, Yorkshire was the largest offshoot and received 2,664 children between 19 August 1757 and 31 December 1772. It closed in 1773 because Parliament came to regret its generosity and gradually reduced payments to the Foundling Hospital from 1767, removing them in 1771. This forced the apprenticeship of children aged seven and younger (McClure 1981; Allin n.d.).⁵⁶ Thousands of children required hundreds of thousands of garments and this paper explores how the Ackworth branch provisioned the children with clothing. A manufactory was set up at Ackworth to produce cloth and clothing. Children carded, combed, spun and wove woollen and flaxen cloth that was worn by their peers at Ackworth and the London Foundlings and sold externally. They made linen underwear and clothes for the girls, household linens and knitted stockings.

The Ackworth archive is unusually rich. The sources used for this paper are the monthly expenditure on clothing and linen book, the daily journals which are the best surviving record of manufactory work, bills, correspondence between the London and Ackworth Hospitals, and the sub-committee records which provide exceptional levels of detail about production and procurement. The tailor's book and manufactory account are missing but can be reconstructed from the aforementioned sources.

The Foundlings were dressed in a Hospital 'Uniform' from its opening. The boys wore a coat and breeches. Waistcoats were added in 1772 for warmth. The girls wore gowns cut in the adult style.⁵⁷ At Ackworth the girls were given serge coats and bays petticoats. Serge and bays were cheap mixed wool textiles with woollen and worsted yarns. Copper-coloured serges were produced by the manufactory and were most likely to have been used for the girls' coats. The colour of the petticoats is unclear, but they were most likely red given the large quantities produced by the manufactory. The boys were dressed in brown or copper broad cloth, a typical textile for men's tailoring.⁵⁸ Boys' clothes were made by tailors who were paid 11d. for each pair of jacket and breeches. Ackworth had one mantua-maker in charge of the clothing for 200 girls. She was paid an annual salary of £5.⁵⁹

External suppliers and in-house manufacture were used to clothe the Foundlings. The Hospital relied on external suppliers for services that required apprenticeships to gain sufficient skill and thus could not be done by the Foundlings such as tailoring, cobbling and finishing cloth. The Ackworth Committee's preference was for work to be completed on-site because it was cheap, reliable, there was greater quality control, and it trained the Foundlings to be industrious from a young age, a key Hospital aim.

⁵⁶ London Metropolitan Archives (LMA), A/FH/A/15/002/005, Account of the Children in the Foundling Hospital at Ackworth, 1771-2. All A/FH/ documents are held in the LMA.

⁵⁷ 'Regulations for the Foundling Hospital', *Gentleman's Magazine* (1747), p.284.

⁵⁸ E.g. A/FH/D/01/016/003, Daily Journal, pp.3, 39, 139, 171, 215; A/FH/D/01/016/005; A/FH/Q/01/011, Letter Book, 1762-6, Hargreaves to Collingwood, 21 Oct. 1766.

⁵⁹ A/FH/Q/01/011, 'Copy of Mr White's Remarks' Dec. 1769; A/FH/Q/01/028, Ackworth Monthly Expenditure on Clothing and Linen, p.77.

The manufactory was a key part of the Ackworth hospital. It produced clothing for the children and taught them textile production skills that some, particularly the girls, would use during their adult lives. The intention was not to teach them a trade but ‘to give them an early Turn to Industry by giving them constant employment’, even the ‘Lame and infirm’.⁶⁰ In the London Hospital the children were set to work for 9.5 hours a day in the summer and at least 5.5 hours in the winter; these hours included a break for lessons every day (Allin, n.d.). They started work aged four or five. The children received a similar education to pauper factory apprentices (PFAs) (Honeyman 2007) in the late eighteenth century and early nineteenth century who worked in textile factories and were also taught literacy and numeracy. Like the PFAs, Foundling girls were taught domestic work to make them widely employable post-apprenticeship. The conditions at Ackworth were superior to workhouses, the main institutional alternative for the Foundlings (Dolan 2016).

The Hospital’s requirement that the Foundlings work was typical of its time, although this study is a couple of decades earlier than other research. Humphries (2010) identified that the average age that children of low wage earners started work was 10. Interference with income provision by the male head of the household led children to start work early, so the Foundlings were no different to their peers. Humphries’ examples were apprenticed at 14, much later than the children under seven apprenticed by Ackworth as a means of responding to the removal of Parliamentary funding.⁶¹

The main business of the Ackworth manufactory, established in 1758, was the production of woollen and worsted textiles. Specific work was undertaken by the children. They carded the wool and combed the worsted to clean it and align the fibres for spinning, spun it into woollen and worsted yarn, and wove the yarn into cloth. Some cloth manufacturing work was outsourced. John Whittaker’s bill for serge woven offsite in 1767 charged for yarn and weaving processes. Whittaker ended the bill with the note ‘Desires you would send me some more weft’.⁶² Ackworth weft was used to reduce costs. Weft yarn was potentially quicker and easier to produce than warp yarn. It could be spun with less twist because it was not under tension like the warp which needed a stronger yarn (Styles 2015).

The Ackworth branch came to supply the London Hospital with much of its fabric during the former’s short existence through producing wool textiles and proxy purchasing of linen. By December 1765, production levels at Ackworth were so high that Richard Hargreaves, Master of the Ackworth branch hoped to fully meet Ackworth’s and London’s needs.⁶³ Orders placed by the London Hospital with Ackworth were essentially business transactions. The trade between the branches was mutually beneficial. While Hargreaves begged for orders in his letters, the London Hospital was equally reliant on Ackworth.⁶⁴ Typical business methods were used to establish the appearance and the quality of linens and woollens sent from Ackworth. Samples of cloth were used to send potential products for the London Hospital’s approval, standard business practice.⁶⁵ Hargreaves regularly assured Thomas Collingwood, the London Hospital secretary, of the good quality of their manufacture. Soliciting an order in 1765 Hargreaves stated ‘I make no doubt but the Prices when Compared with the Goodness of the Cloaths will exceed your expectations’.⁶⁶ Only one instance of a discount for lower quality workmanship appeared in Hargreaves’ letters, when in

⁶⁰ A/FH/Q/01/011, Thomas Lee to Collingwood, 16 Aug. 1769.

⁶¹ A/FH/Q/01/065, Monthly Account of Children at Ackworth.

⁶² A/FH/D/01/020/002, Vouchers, bill 9. See also bill numbers 1, 2 and 15. All 1767.

⁶³ A/FH/Q/01/010, Letter Book, 1762-6, Hargreaves to Collingwood, 12 Dec. 1765.

⁶⁴ E.g. A/FH/D/01/002/001, Correspondence from London, Collingwood to Hargreaves, 3 Aug. 1762; A/FH/D/01/002/007, Correspondence, Collingwood to Hargreaves, 22 April 1769; A/FH/Q/01/010, Hargreaves to Collingwood, 18 Jan. 1763, 11 April 1763.

⁶⁵ E.g., LMA, A/FH/D/01/002/001, John Tucker to Hargreaves 27 Nov. 1762.

⁶⁶ A/FH/Q/01/01, Hargreaves to Collingwood, 6 June 1765.

October 1765 he informed Collingwood that of the serges sent 'are inferior to what I used to send you' therefore he had charged less.⁶⁷

Although the cloth trade was mutually beneficial, Ackworth products were not paid for unquestioningly. Cloth was expected to stand up to comparison with that sold in London. Collingwood complained that Ackworth serge was lighter and more expensive than serges bought in London. He commented that 'you must try to better your Manufacture'.⁶⁸ On receipt of blankets the London Committee responded that 'there are a large quantity of the same size that you have at your Hospital, now in this House, which have not been used, they came from your Manufactory' and that all would now be returned.⁶⁹

Ackworth required large quantities of products annually and thus needed reliable suppliers who provided good quality products in sufficient quantity. Suppliers were sought through advertisements and handbills and perhaps also informally, although these approaches were not recorded. The commissioning process was rapid. Handbills advertising for suppliers of coats and breeches were ordered to be printed and distributed on 6 March 1766 and on 3 April the agreements with suppliers were recorded. External orders were commissioned from patterns which helped the Committee make the initial choice of supplier, style and introduced greater accountability into the process.⁷⁰ There was a regional focus to Ackworth's textile purchase; linen and broadcloth were bought in Yorkshire and linens and decorative cotton-linens from Manchester.

The Ackworth Management Committee found it difficult to find reliable garment suppliers able to cope with the quantity of goods required. Only hats were obtained from a single supplier. Shoes and boys' tailored clothing required multiple suppliers. 25 people sold shoes to the Hospital over 16 years. Orders ranged from one pair to 288 pairs which implies supply and quality issues. The erratic use of multiple shoemakers from 1758-64 suggests problems with identifying suppliers that could provide enough shoes, in the range of required sizes, and at a sufficient quality while the number of children grew exponentially. Presumably suppliers dropped off after a few years due to failures in quality, price, to meet deadlines, or retirement or bankruptcy. The focus on three suppliers – Thomas Lee, John Thompson and John Firth from 1766-73 indicates that the Hospital governors preferred to work with a smaller number of trusted suppliers. Thomas Lee was the only consistent supplier of new shoes and he mended old shoes throughout the existence of the branch.

Difficulties in obtaining goods externally emphasizes the importance of the in-house production of other garments. Prices and timings could be managed, there was a sufficient work force, and quality control could be undertaken during the production process. The girls' clothing appears to have been produced in the Ackworth Hospital indicating that this was the preferred option where possible. However boys' tailoring required a skill set that the Hospital was not able to teach the children within their relatively short residences. The children were set to work on tasks where they could achieve reasonable efficiency and create a durable product.

The Foundlings' shirts and shifts were made from linen which was bought or was woven in the manufactory from flaxen yarn spun by the children. The ratio of internal production to external linen purchases is not known. Linen cloth was purchased from local suppliers and at Knaresborough Fair, Yorkshire which was a major centre of linen production.⁷¹ Initially shirts and shifts were bought from the tailor Robert Heptonstall.⁷² From 1761-70, 13,442 shirts and shifts were churned out by the manufactory. It is not clear how many children undertook this work because plain sewing was a general female duty. In 1767,

⁶⁷ *Ibid.*, Hargreaves to Collingwood, 7 Oct. 1765.

⁶⁸ A/FH/Q/01/016/004, Secretary's Papers, 1762-7, Letter from Collingwood to Hargreaves, 1 April 1762.

⁶⁹ A/FH/D/01/002/001, Collingwood to Hargreaves, 3 Aug. 1762.

⁷⁰ LMA, A/FH/Q/01/008, Order Book, pp.10, 13, 80-81.

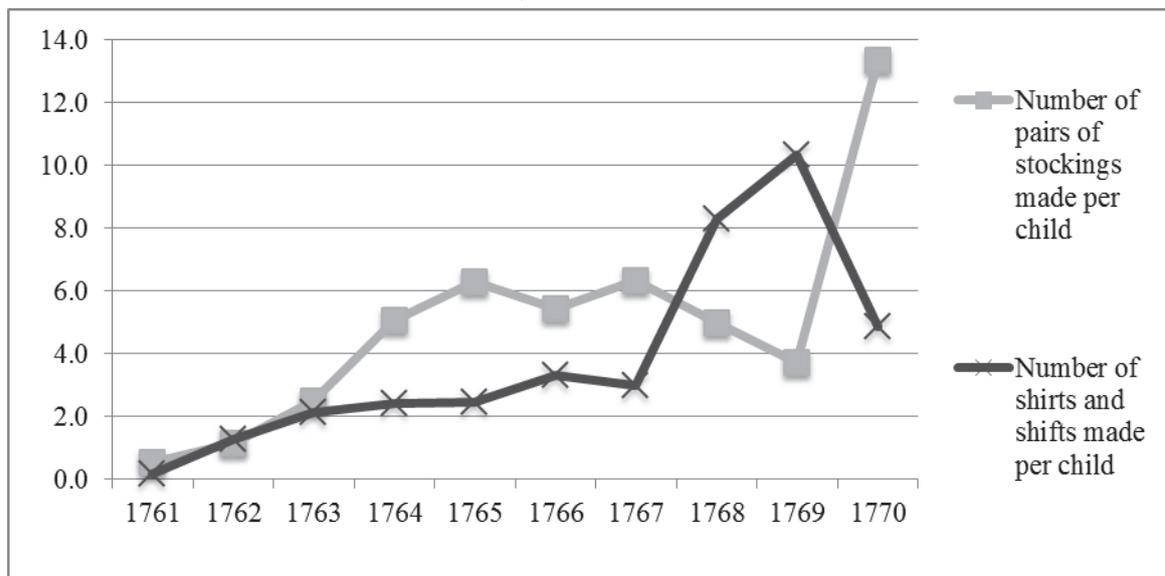
⁷¹ A/FH/Q/01/028, e.g. pp.72-3.

⁷² *Ibid.*, p.2.

460 girls were resident at Ackworth. If all of the girls worked on the 1,680 pieces of underwear produced, they each produced an average of 3.7 shirts or shifts in a year, a low rate.⁷³ This slow level of production demonstrates that the girls did not make underwear fulltime.

Stockings were the only garments other than girls' coats and petticoats where nearly the whole production process was undertaken at Ackworth. Payments to the manufactory for stockings, stocking yarn and sometimes knitting and dyeing stockings appear from 1758-73. Around half a pound of fibre was needed for a pair of stockings. Stockings were bought in the first few years, then made until 1773. The average price paid for a stone of wool in 1763 was 8s. 7d. therefore a half pound of yarn cost 3d. and the lowest price that could be achieved was 3d. per pair in 1763, compared to stockings that were bought in at 6.5d. in 1758.⁷⁴

Figure 1: *The number of shirts and shifts and pairs of stockings produced per child under the care of Ackworth, 1761-70*



Large numbers of stockings were produced annually, peaking at 3,625 pairs in 1765. The Ackworth manufactory produced 19,184 pairs of stockings in 10 years. The correlation between the number of children under Ackworth's care and the number of stockings produced in the manufactory is limited. There was a general increase in the numbers of pairs as more children entered Ackworth, however there are anomalies: 2,264 stockings were knitted in 1770 when only 170 children were under Ackworth's care. There was also limited correlation between the production of stockings and underwear as shown in figure 1. The jump in the numbers of shirts from 1768-70 is due to apprenticeship. The number of children halved from 1767 to 1768. Boys were easier to apprentice than girls: there were 276 boys and 449 girls in the Hospital in December 1767, a disparity which continued in 1769 and 1770.⁷⁵ Only girls produced shirts and shifts therefore the disproportionate production of underwear in 1768 and 1769 related to girls continuing their plain sewing, despite the declining numbers of children. The dip in the numbers of pairs of stockings produced in 1768-9 is likely to relate conversely to the declining numbers of boys. In the London Hospital boys knitted stockings, presumably it was the same at Ackworth.⁷⁶ The final jump in stocking production in 1770 could relate to use of leftover yarn originally spun for cloth production.

In summary, the procurement of clothing for the children was primarily driven by business decisions. Issues of quality, price and reliable production, combined with a desire to

⁷³ A/FH/Q/01/065.

⁷⁴ A/FH/Q/01/028, p.4; A/FH/Q/01/047, Receipt Book for Wool 1763-1765, samples from pp.1, 20-22.

⁷⁵ A/FH/Q/01/011, Hargreaves to Collingwood, 7 May 1768.

⁷⁶ A/FH/A/03/005/004, Sub-Committee Minutes 1759-1761, e.g. p.76.

train the children into industrious behaviour and to provide girls with skills for their future lives influenced garment procurement. Linen underwear, girls' clothing and stockings were produced in the manufactory to teach industriousness, there was also a reliable workforce, quality control and it saved money. Boys' clothing and shoes were made externally because they required greater skill. The Ackworth manufactory was a business venture. The London Hospital did not accept textiles of any quality from Ackworth. Foundling Hospital and parish practice differed. Although both aimed for decent clothing for the children, in-house cloth manufacture was rare at parish level.

The experiences of the Foundling children at Ackworth parallel Humphries' and Honeyman's findings on child labour and apprenticeships. The parents of the children Humphries and Honeyman discuss were low-paid and they started work before the age of 10. They were more vulnerable to various types of abuse in factories than the children from the Hospital's branches, but they were taught varied skills to widen their chances of future employment (Honeyman 2007). There were two major differences between the Ackworth Foundlings and the children studied by Humphries and Honeyman. Firstly the Foundlings were apprenticed and were set to formal work at earlier ages, four or five. Secondly, their work in a large manufactory was undertaken in the decades before the studies by Humphries and Honeyman. It appears that the education and apprenticeships of the Ackworth Foundlings were at the forefront of practical education.

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‘There ought not to be more than one landlord on a property’: Subletting and capitalist farming in seventeenth to eighteenth-century England

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Introduction

Historians have found evidence of subletting from the thirteenth century to the nineteenth century, although there are differences in the kinds of subtenancy that particular documents recorded and in historians’ definitions of what constitutes a subtenant.⁷⁷ Historians have tended to emphasize the precarious socio-economic position of subtenants vis-à-vis direct manorial tenants.⁷⁸ Undoubtedly, there were many subtenants, particularly of residential properties, who eked out a precarious existence. However, the marginal position they occupy in manorial documents has somewhat unfairly led to them being portrayed as marginal members of society. Subtenants could occupy positions of local authority and subletting was practised by cultivators of small and large farms, whether they owned all or none of their land.⁷⁹

This paper addresses three main research questions: How prevalent was subtenancy? What implications does subtenancy have for existing farm size data, and interpretations of agrarian capitalist development? Why did people sublet their land? The paper shows that subtenancy was widespread and farms were engrossed through subletting. Land was sublet and leased for a wide variety of reasons, including to pay off debt.

I

Manorial documents record the rents and obligations owed by tenants to the manorial lord. Therefore manorial surveys and rentals record the holdings of direct tenants who were not necessarily the cultivators of the land as many had the right to sublet.⁸⁰ Poor rates and tithes were taxes on the actual occupants of properties and historians have cross-referenced these with manorial documents to establish the owners and occupiers of properties.⁸¹ This paper expands this approach by linking subtenancy data to georeferenced tithe maps that allow the data to be analysed temporally and spatially. For example, a range of sources for Puddletown in Dorset have been cross-referenced, linked, and georeferenced to produce a dataset that records the subtenancy data on 442 fields in the parish between 1719 and 1792. This amounts to c.29,000 records, each individually linked to information contained in the manorial surveys and poor rates, such as each property’s allotted common for beasts or sheep.⁸² The data presented here are drawn from case study parishes in the counties of Dorset, Somerset, and

⁷⁷ Marjorie K. McIntosh, *A Community Transformed: The Manor and Liberty of Havering, 1500-1620*, (Cambridge: Cambridge University Press, 1991), p.22; Andrew Jones, ‘Caddington, Kensworth, and Dunstable in 1297’, *The Economic History Review*, 32 (1979), 316-27 (p.323).

⁷⁸ B. M. S. Campbell, ‘The Agrarian Problem in the Early Fourteenth Century’, *Past & Present*, 188 (2005), 3-70 (pp.55-9).

⁷⁹ On officeholding, see H. R. French and R. W. Hoyle, *The Character of English Rural Society: Earls Colne, 1550-1750*, (Manchester: Manchester University Press, 2007), pp.254-66.

⁸⁰ Customs prohibiting or restricting subtenancy varied. Eric Kerridge, *Agrarian Problems in the Sixteenth Century and After*, (London: Allen and Unwin, 1969), pp.48-53; J. Whittle, ‘Leasehold Tenure in England C.1300-C.1600: Its Form and Incidence’, in *The Development of Leasehold in Northwestern Europe, C. 1200-1600*, ed. by Bas J. P. van Bavel and Phillipp R. Schofield (Turnhout, Belgium: Brepols, 2008), pp.139-54 (pp.144-6).

⁸¹ The approach adopted here is a modified version of that used in French and Hoyle, pp.251-92.

⁸² It is beyond the scope of this paper to analyse the relationship between a property’s common rights and subtenancy, but this example has been included to illustrate the potential of the dataset.

Gloucestershire. In some instances only ‘snap-shot’ evidence from a single year is available, while for others, such as Puddletown, the documents allow a reconstruction of subletting activity over the course of the eighteenth century.

II

The work on subtenancy to date suggests that a significant proportion of cultivators in the early modern period held their land under leasehold tenure as subtenants to customary tenants. In 1554 at Cannock in Staffordshire, 64 per cent of land was sublet.⁸³ In 1613 at Nutfield manor in Surrey around 80 per cent of the land was farmed by subtenants.⁸⁴ On average, 30 per cent of land was sublet across seven Hampshire manors between 1645 and 1705, with over 70 per cent of the land being sublet on some manors.⁸⁵ In the mid-seventeenth century, 85 per cent of the land in Romney Marsh in Kent was farmed by lessees or subtenants.⁸⁶ At Earls Colne in Essex, almost 60 per cent of copyhold land was sublet in 1730, rising to 70 per cent thirty years later.⁸⁷

Figure 1 shows the proportion of land that was sublet in select parishes in Somerset, Gloucestershire, and Dorset. In conjunction with the evidence of subletting in existing studies, the data show that subletting was prevalent across England throughout the early modern period. Many more cultivators occupied land on a commercial leasehold basis than manorial documents suggest.⁸⁸ This calls for a reconsideration of the narratives surrounding the conversion of copyhold tenure to leasehold tenure and the customary tenants’ role in English capitalist agrarian development.⁸⁹

⁸³ C. J. Harrison, ‘Elizabethan Village Surveys: A Comment’, *The Agricultural History Review*, 27 (1979), 82-9 (p.86).

⁸⁴ P. Finch, ‘Landholding and Subletting: A Surrey Manor in 1613’, *The Local Historian*, 18 (1987), 16-8 (p.18).

⁸⁵ J. D. Gayton, ‘Tenants, Tenures and Transfers: The Landholding Experiences of Rural Customary Tenants in Some Hampshire Downland Manors, 1645-1705’, (University of Exeter, 2013), p.178.

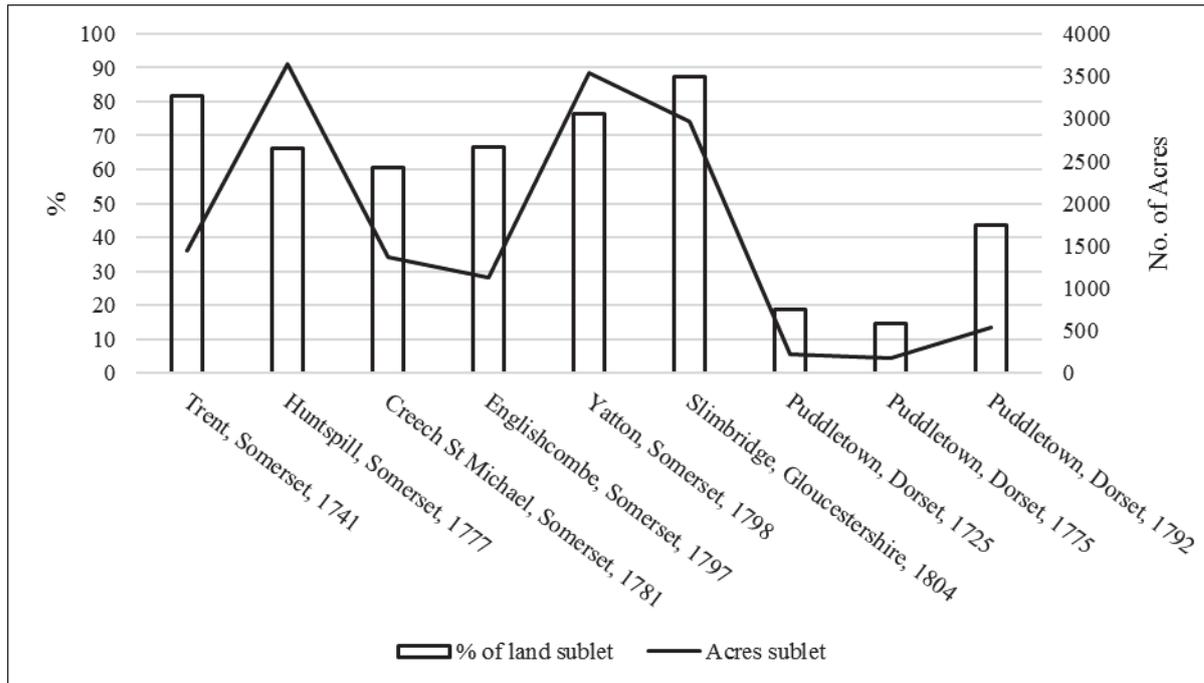
⁸⁶ S. Hipkin, ‘Tenant Farming and Short-Term Leasing on Romney Marsh, 1587-1705’, *The Economic History Review*, 53 (2000), 646-76 (p.673).

⁸⁷ French and Hoyle, p.254; J. Rhodes, ‘Subtenancy in Earls Colne, Essex 1750-1806’, (Unpublished MA dissertation, University of Exeter, 2013), p.33.

⁸⁸ This was noted, but not quantified in Kerridge, pp.51-2.

⁸⁹ On the dangers of neglecting the tenant’s role as landlord: P. Croot and D. Parker, ‘Agrarian Class Structure and Economic Development’, *Past & Present*, 78 (1978), 37-47 (pp.39-40); Hipkin, pp.672-3.

Figure 1: Land sublet in Dorset, Gloucestershire, and Somerset parishes/manors, 1725-1804



Source: Somerset Heritage Centre: HC, DD\X\JONES/1, D\P\hun/20/1/6, D\P\crch/23/10, T\PH\dc1/10-11, A\DHN/2. Gloucestershire Archives: A, P298a OV 1/1. Dorset History Centre: D-PUD/E/1/1/5, D-PUD/E/1/1/10, PE-PUD/OV/1/4, PE-PUD/OV/1/3, PE-PUD/OV/1/2.

III

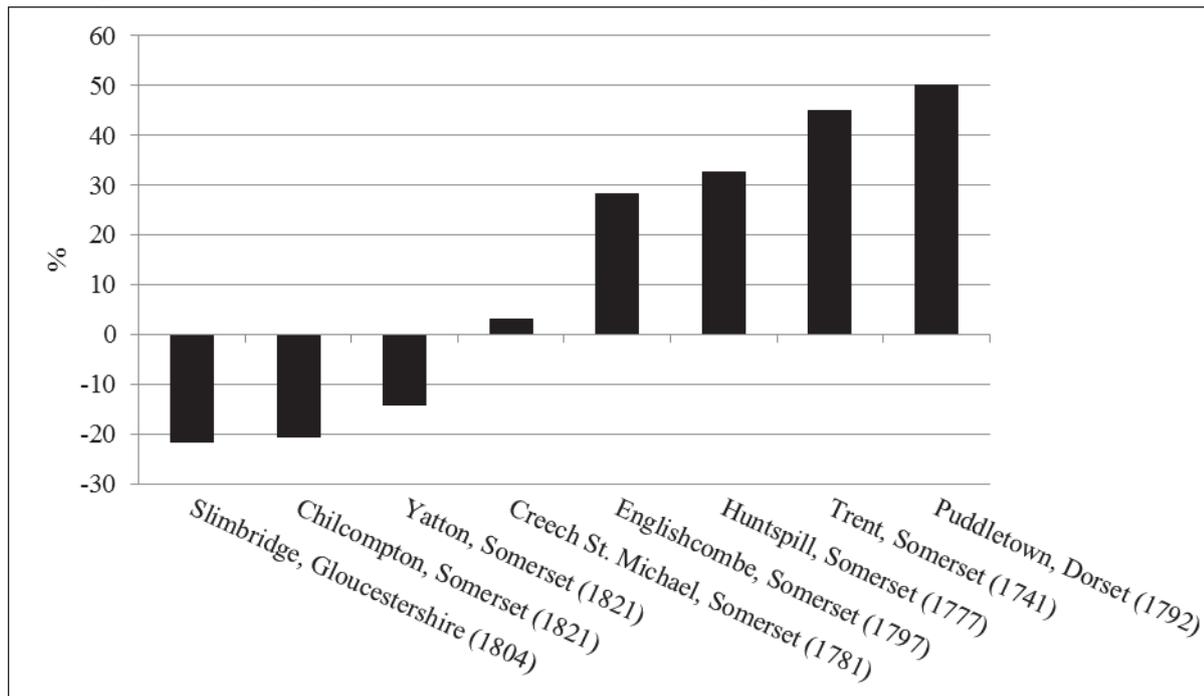
Subtenancy is commonly cited as a problem which has the potential to undermine farm size data derived from manorial documents. Manorial documents were records of ‘units of property’, (ownership), rather than the ‘units of production’, (occupation), in which land was actually cultivated.⁹⁰ In his classic work, *Enclosure and the Yeoman*, Allen argued that manorial documents provide reliable data on farm sizes. He compared the land owned and occupied in one parish and concluded that subletting activity did not greatly alter the size of farms.⁹¹ The subtenancy data presented here allow the size of units of property and units of production to be compared. Figure 2 shows that units of production were significantly smaller or larger than the units of property in 7 out of the 8 parishes studied. In five of the parishes, the units of occupation were on average larger, and several others significantly larger than units of ownership. The significance of this is twofold. Firstly, these figures demonstrate that historians need to account for subtenancy in their calculation of farm sizes and the conclusions of existing studies based on manorial documents may be subject to revision.⁹² Secondly, the engrossment of farms was driven by the occupiers of the land and not by the owners. Historians’ understanding of the timing and nature of increases in the size of farms (and capitalist agrarian development more generally) may therefore need to be reconsidered.

⁹⁰ H. R. French and R. W. Hoyle, ‘The Land Market of a Pennine Manor: Slaidburn, 1650-1780’, *Continuity and Change*, 14 (1999), 349-83 (p.351).

⁹¹ R. C. Allen, *Enclosure and the Yeoman*, (Oxford: Oxford University Press, 1992), pp.75-6, n. 26; L. Shaw-Taylor, ‘The Rise of Agrarian Capitalism and the Decline of Family Farming in England’, *The Economic History Review*, 65 (2012), 26-60 (p.46).

⁹² For a comprehensive study of farm sizes not based on manorial documents, see J. Barker, ‘The Emergence of Agrarian Capitalism in Early Modern England: A Reconsideration of Farm Sizes.’, (Unpublished PhD thesis, University of Cambridge, 2013).

Figure 2: *Percentage difference between units of occupation and units of ownership*

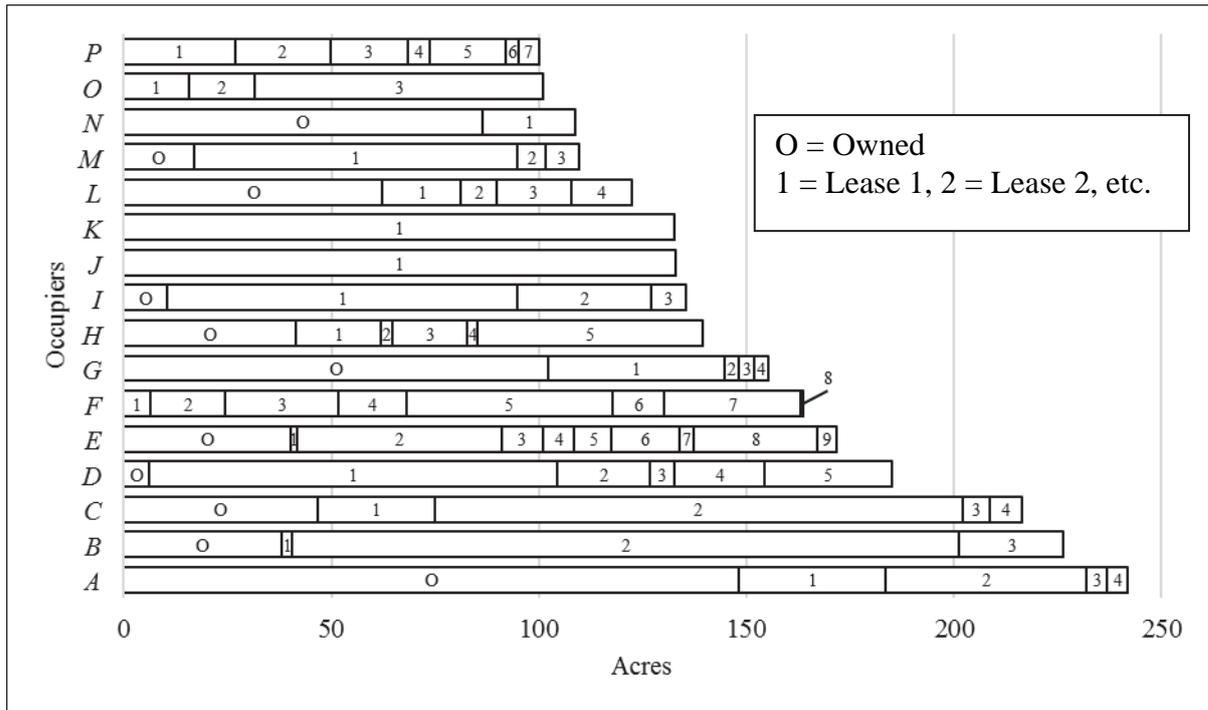


Source: As in figure 1 and Somerset Heritage Centre: D\P\chilc/13/1/1.

Subletting allowed the cultivators of land to engross their holdings, and explains why the units of occupation were larger than the units of ownership. Allen demonstrated that large farms were not made through the leasing of several smaller properties, but calculations of this kind based on land tax assessments are problematic and evidence elsewhere suggests that the accumulation of small properties through leasing was practised.⁹³ Figure 3 shows the composition of farms over 100 acres in Huntspill in Somerset. Occupiers combined their own land and leases from multiple owners (sometimes up to nine different owners) to form farms in excess of 100 acres. Subletting was a commonly used and viable strategy to increase the size of a farm, and one to which manorial documents are often blind.

⁹³ Allen, pp.87-9. On problems using the land tax, see D. E. Ginter, *A Measure of Wealth: The English Land Tax in Historical Analysis*, (London: Hambleton, 1992), pp.14-104. On multiple leases, see S. Hipkin, 'The Structure of Landownership and Land Occupation in the Romney Marsh Region, 1646-1834', *The Agricultural History Review*, 51 (2003), 69-94 (pp.86-9).

Figure 3: Breakdown of subtenants' own and leased holdings in Hunstpill, Somerset c.1777



Source: Somerset Heritage Centre: D\P\hun/20/1/6.

III

Calculating subtenancy rates is challenging, and establishing owners' and occupiers' motives to sublet land is harder still. Existing research has found conflicting evidence of the effect of residency on whether an individual sublet their land, but there is broad agreement that widows and minors were most likely to sublet or have land sublet on their behalf.⁹⁴ Cultivators sublet land that lay in close proximity to their existing holding when purchase was not possible. This commonly occurred when they lacked the resources to purchase or the owner was not inclined to sell. For example, in Puddletown in 1733 John Harris rented three closes of land from Mary Clark which lay on the other side of a lane to his own land. He also rented a strip of water meadow from William Sparks that was situated in the next-but-one strip to his own strip of water meadow.⁹⁵ In 1792 John Allen owned eight-sixteenths of 'white meadow' in Puddletown, co-owned another three-sixteenths with John Mitchell, and leased a further two-sixteenths from Mrs Cole, two-sixteenths from Mrs Woodrow, and one-sixteenth from Mrs Way, thereby uniting the whole.⁹⁶ Figure 4 shows the land John Hill rented in 1792 from John Kiddle which lay adjacent to fields he rented from Benjamin Sparks, both of which lay less than half a mile away from land he rented from Joseph Sparks.⁹⁷

The location of particular fields can explain why they may have been desirable additions to an occupier's existing holding but it does not explain why an owner had recourse to sublet in the first place. In some cases, subletting allowed owners to pay off debt without liquidating their property. In 1753, Ann Langford of Puddletown owed money to Mr Robert Boswell. Ann made provision in her will to pay back these debts. She bequeathed the arable fields of her land to her son Simon Langford in trust that he 'shall pay or cause to be paid to the said Mr Robert Boswell the Money I owe him with Lawfull Interest out of the Profitts

⁹⁴ French and Hoyle, pp.281-2; Gayton, pp.193-4; I. Whyte, 'Owners and Occupiers: Subtenancy and Subtenants in Watermillock, Cumberland, C.1760-C.1840: A Case Study', *Northern History*, 50 (2013), 77-92 (p.85); J. Whittle, 'Enterprising Widows and Active Wives: Women's Unpaid Work in the Household Economy of Early Modern England', *The History of the Family*, 19 (2014), 283-300 (p.294).

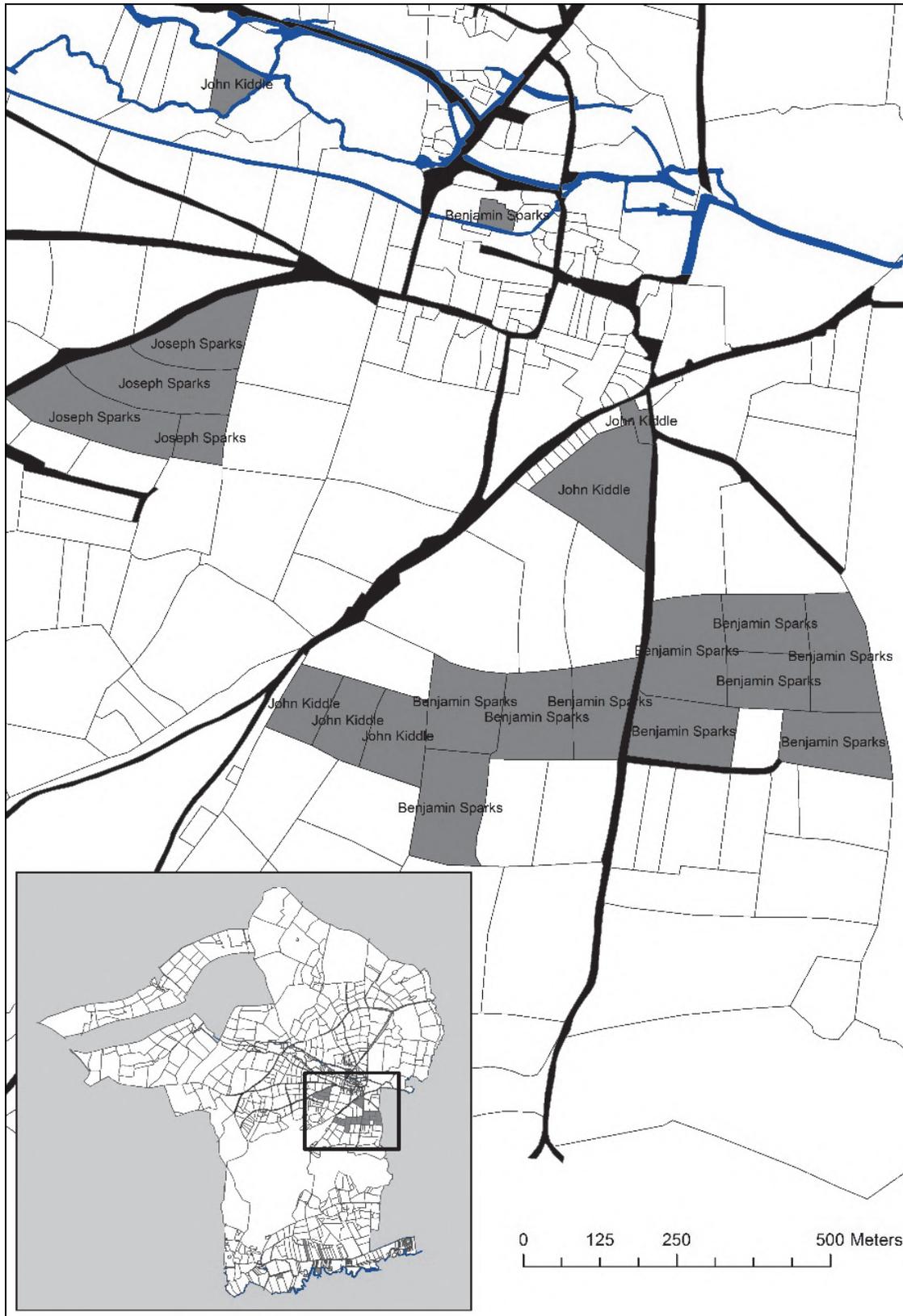
⁹⁵ Dorset History Centre, PE-PUD/IN/5/1/1; PE-PUD/OV/1/2; D-PUD/E/1/1/5.

⁹⁶ Dorset History Centre, D-PUD/E/1/1/10; PE-PUD/OV/1/4.

⁹⁷ Dorset History Centre, PE-PUD/OV/1/4; D-PUD/E/1/1/10.

arising from the said Four Arable Fields'. Simon subsequently sublet these fields to John Allen from the late 1750s to the mid-1770s in order to pay off this debt.⁹⁸

Figure 4: Map of John Hill's farm in Puddletown, Dorset in 1792



Source: Dorset History Centre: PE-PUD/OV/1/4 & D-PUD/E/1/1/10. Owners' names displayed on map.

⁹⁸ Dorset History Centre, Ad/Dt/W/1760/38; PE-PUD/IN/5/1/2.

The rental income from subletting was itself not always used to directly pay off debts. In 1778, Charles Croad owned about 15 acres of land at 'Chinehill' in Puddletown which had a mortgage charged upon it. He stated in his will that after his decease, his wife 'may lett ye said Estate to whomsoever she may think Propper'. Subletting the land meant that there was no longer any need for his wife to keep his farming stock, and so he directed his executors in trust to 'sell my stock, and with which Money pay as much as they shall think Propper to Lessen the Mortgage which is now on it [the land at Chinehill]'. His stock was valued at around £42 which enabled his executors to pay back a bond of £35 to Mrs Manfield. Subletting therefore allowed Charles Croad to disencumber his property of debts without relinquishing the asset.⁹⁹

From the perspective of the lessee, subletting could provide an opportunity for someone with a future interest in a property to gain early 'access'. In 1759, Sarah Dobson acquired a reversionary lease on the 'Langfords' property referred to above. The lease in reversion passed to her son, John Lawrence Dobson, in 1773 and he sublet the property from the Langfords. Having a subtenant on the property who had a future interest in it must have proved an attractive prospect for the owner, Simon Langford.¹⁰⁰ Indeed, elsewhere such arrangements did not require the usual licences from the manorial lord imposed on other subletting activity.¹⁰¹

Conclusion

This paper presents new data on subtenancy levels and, when viewed in conjunction with existing studies, clearly demonstrates that subletting was widespread across England throughout the early modern period. Subtenancy rates varied considerably over time and place but further work needs to be undertaken to establish the causes and chronology of change. Tenure and manorial custom may have affected subtenancy rates but other factors also need to be considered.¹⁰² Stagnant manorial land markets and population pressure may have driven subtenancy levels up but micro-level factors also require consideration, such as the role of the lifecycle in determining a family's need for land.

Accounting for subletting in the calculation of the size of farms significantly alters the figures produced. Occupiers engrossed their holdings through subletting, rendering units of production larger than units of ownership in a number of places. Subtenants leased land from a number of owners, many of whom were customary tenants, and they did so to acquire parcels of land adjacent or near to their farms. This land entered the subletting market for a range of reasons, and this paper shows that debt can be added to widowhood, minority, and non-residency as some of the motivations that explain why an owner sublet their land.

⁹⁹ Dorset History Centre, Ad/Dt/W/1779/24; Da/I/1780/4.

¹⁰⁰ Dorset History Centre, PE-PUD/OV/1/3; D-PUD/B/1/1/5.

¹⁰¹ J. Hasler (ed.), *Wookey manor and parish 1544-1841*, 83 (Taunton: Somerset Record Society, 1995), p.77.

¹⁰² On tenure as a possible determinant of subtenancy rates, see Gayton, 'Tenants, Tenures and Transfers', p.193.

Taxing wealth in eighteenth-century Britain

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The introduction of the Income Tax (IT) in Britain in 1799 is often seen as an anomaly in the narrative of eighteenth-century British taxation. The general argument is that Britain was able to out-tax, out-borrow, and, most importantly, out-spend its eighteenth century imperial rivals, especially France, because of its reliance on the indirect taxation of consumption rather than the direct taxation of wealth.¹⁰³ The IT was an emergency war-time measure, confirmed by its peace-time repeals in 1802 and 1816 (not reappearing until 1842), and was only tenable because of the fiscal and political crises of the 1790s. Whilst it was in some sense a break from earlier practice in tax policy, it also needs to be considered within the wider context of eighteenth century debates about taxation. Edwin Seligman has provided the clearest enunciation of the fundamental principle of the development of taxation in Europe and America up to the nineteenth century: ‘that each individual should be held to help the state in proportion to his ability to help himself’.¹⁰⁴ Taxing expenditure as a ‘measure of ability’ was preferred in eighteenth-century Britain because it overcame the major problem of directly taxing wealth: how to assess and collect taxes in accordance with the payer’s means without excessively intruding into their lives. Indeed, the Land Tax (LT), and its monthly assessment and subsidy predecessors, were all intended to tax a variety of wealth and possessions;¹⁰⁵ the act of 1692, on which the annual LT was based, levied an aid on ‘any Estate in ready Monies, or in any Debts ... [or] any Estate in Goods, Wares, Merchandizes, or other Chattels or personal Estate whatsoever’ in addition to revenue from land.¹⁰⁶ That this levy becomes known simply as the LT is evidence of the state’s failure to sufficiently tax wealth that was not land. This had been noted by Adam Smith in *The Wealth of Nations* when he astutely observed that the British ‘state not knowing how to tax, directly and proportionally, the revenue of its subjects, endeavours to tax it indirectly by taxing their expence’.¹⁰⁷ But this was not without its problems. Focusing on the extraordinary nature of the IT loses sight of its relationship with the continuous debate about the best the way in which to tax people in accordance with their means. By looking at the transition to the IT, through the Triple Assessment of 1798 (TA), we can see the limits of taxing expenditure as a measure of ability; from this, the tension between the principle of ability and fear of an intrusive state became greater than ever. It is the aim of this paper to show that the TA and IT may have been driven by fiscal need, but they were also the product of intense debate over how to tax wealth.

Seligman’s analysis of the IT traces the development of the principle of ability through its different manifestations of measures of ability: capitation, property, expenditure, and income.¹⁰⁸ As taxes increased over time, so did concern with their burden on the payer. This can especially be seen in England in the seventeenth century with the emergence of political arithmetic as a field of study. Political arithmetic was explicitly an attempt to use ‘Number, Weight, and Measure’ to calculate the wealth of the nation so as to inform the state and her ministers how that wealth could be tapped into equitably.¹⁰⁹ Two of political arithmetic’s greatest proponents, William Petty and Charles Davenant, praised the taxation of superfluities as ideal measures of wealth, with Petty asserting that it was ‘natural justice that

¹⁰³ Mathias and O’Brien (1976); Beckett (1985); and, O’Brien (1988 & 2011).

¹⁰⁴ Seligman (1895), pp.1-22; Cf. Kennedy (1913), pp.82-94.

¹⁰⁵ Chandaman (1975), pp.140-3.

¹⁰⁶ 4 Gul & Mar, c. 1.

¹⁰⁷ Smith (II, 1981), V.ii.k.1.

¹⁰⁸ Seligman (1902), pp.1-4.

¹⁰⁹ Petty (I, 1899), p.244.

every man should pay according to what he actually enjoyeth'; and Davenant arguing that such taxes were 'proportionable to the great wants of the people'.¹¹⁰ This assertion was oft-repeated throughout the eighteenth century, most notably by David Hume and Adam Smith, notwithstanding the fact that some of the most productive taxes on consumption were not luxuries, but necessities: beer, malt, candles, leather, etc. Political arithmetic as a tool to measure the nation's wealth was also used in the formulation of the aid that became the LT, as policymakers sought to equalize the burden of the monthly assessments in accordance with a more accurate valuation of all property in the kingdom.¹¹¹

That expenditure became the preferred measure of ability in the eighteenth century did not entirely remove the fear of an intrusive state. Robert Walpole's attempt to transfer the wine and tobacco duties to the administration of the Excise in 1733 was met with a vociferous and organized opposition that directly targeted the fear of a 'general excise' in the populace. This fear was of a growing state with excessive powers to search the property of merchants and manufacturers in order to assess and collect its taxes. The anxiety surrounding the use of excises was related to those elements of it that made it so productive: its bureaucratic efficiency and powers of inspection.¹¹² Resistance to inspection by Excise officers was prohibited and visitations were unannounced, with officers instructed to attend at the least expected times.¹¹³ This intrusive nature of the Excise inspection led to two future prime ministers, William Pitt the Elder and George Grenville, decrying the largest source of government revenue as 'odious'.¹¹⁴ The fear of an intrusive state was also represented in other areas, such as the attempt to bring in the census in 1753. The problem of the legitimacy of the power of the state to intrude into the lives of its subjects was not restricted to the direct taxation of wealth.

Using expenditure as a measure of ability expanded throughout the eighteenth century, with customs and excises becoming the most productive sources of revenue. These were gradually added to with a series of duties that specifically targeted displays of prosperity, such as those on wagons, carts, horses, male servants, inhabited houses, windows, among others. This disparate group of duties, which later in the century would become known as assessed taxes, had been originally placed under the various existing administrations of collection, the Excise, Commissioners of Stamps, and Commissioners for the Affairs of Taxes, before being reorganized in 1785 and placed under the management of the Board of Taxes.¹¹⁵ These taxes were the epitome of the practice of using expenditure as a measure of ability, as Pitt declared when he introduced the TA to parliament: 'the fairest criterion for judging of the proportions which ought to be paid by the various classes of society according to their income, was the return of assessed taxes'.¹¹⁶ The assessed taxes had already been raised three times in the 1790s (1790, 1796, and 1797), but the strain on the nation's credit from the war with France required more drastic measures. The TA was not in fact a trebling of the rates, as taxpayers were divided according to how much they had previously paid, with those who paid up to £25 being increased three times, rising up to those who paid over £50 being increased five times.¹¹⁷ Although it was using expenditure as a measure of income, the assessment was explicitly linked to income by allowing an abatement of the duties if they exceeded 10 per cent of income. Despite the desire to relate the TA to income, Pitt was wary of the opposition to inquisitorial powers, asserting that it was 'an imprudent and dangerous request', and therefore allowed the abatement on exceeding 10 per cent of income to be declared by oath

¹¹⁰ Petty (I, 1899), p.94; Davenant, (I, 1771), p.62.

¹¹¹ Loft (2013).

¹¹² Brewer (1989).

¹¹³ TNA CUST 142/9, fos. 415-26.

¹¹⁴ In a debate over the Cider Tax: Cobbett (XV, 1806-20), cols. 1307-8.

¹¹⁵ Dowell (II, 1888), p.189; and 25 Geo III. c. 47.

¹¹⁶ Cobbett (XXXIII, 1806-20), col. 1067.

¹¹⁷ 38 Geo. III, c. 16.

without requiring evidence for it.¹¹⁸ In his reflection of these events, the Treasury Secretary George Rose disclosed that a tax on income had been considered before the introduction of the TA, with the decision being taken that it would have been ‘liable to many objections’.¹¹⁹ Although not ideal, assessed taxes were considered to be a ‘tolerably fair criterion of the income of individuals, to which their expenditure was supposed in general to be proportioned’.¹²⁰ This desire to tax in accordance with income is also recorded in a note of a conversation between Pitt and Lord Shelburne in 1795.¹²¹

As a result of the lax requirements of income disclosure, the TA only raised less than half of the £4.5 million projected, mitigated by an additional £2 million in voluntary contributions. It perhaps should not have been a surprise that revenue oaths were abused, given that a ‘Customs House Oath’ had long been a euphemism for a lie. The projected revenue had been calculated by Pitt drawing on the political arithmetic of Petty, Davenant, Gregory King, and Arthur Young, even citing them in parliament as support.¹²² Using these methods, Pitt estimated the annual rental value of land at £25 million, deducting a fifth from this to remove the poorest of society, and deduced that there was £20 million of taxable property in the kingdom.¹²³ He was, however, already well aware of his greatest obstacle: ‘the means of taxing property equally, without compelling improper disclosure’.¹²⁴ Indeed, in responding to objections to the Triple Assessment, Pitt opined that ‘if the amount of every man’s property could be ascertained, it would be a most desirable thing to make the people contribute to the public exigence in proportion to their wealth. But there existed no means of ascertaining the property of individuals, except such as were of a nature that could not be resorted to.’¹²⁵ The calculations that Pitt had come up with confirmed to him that there were men of considerable property who were not being taxed in accordance with their means because of their miserly and parsimonious spending habits. This was a significant limitation on the use of expenditure as a measure of ability and a clear conflict between the principle of ability and a non-invasive state.

Although the TA and IT satisfied the principle of taxing in accordance with means, it was not only the intrusiveness of them that caused tensions. In particular, they ran counter to some of the most desired attributes of taxing consumption; in Hume’s words, that they were ‘in some measure voluntary’ because ‘a man may chuse how much he will use the commodity’; and that they are ‘scarcely perceived by the consumers’.¹²⁶ John Nicholls reaffirmed this in the debate over the TA, claiming that it violated the principle of taxing luxury, for it had been established that ‘if you choose the luxury, you must pay for it’; the problem here was that ‘the power of choice was excluded’.¹²⁷ Charles Fox was similarly outraged about how the designers of the TA showed contempt for the liberty of the subject, and they very consistently follow up their plan with contempt for their property.¹²⁸ Fox was one of the most vociferous opponents to both taxes, citing Smith’s principle of equality in support of his argument against the manner in which the TA fell ‘on different classes of the community’ filling it with ‘the most monstrous inequalities and the most gross injustice in every branch of it’.¹²⁹

¹¹⁸ Cobbett (XXXIII, 1806-20), col. 1071.

¹¹⁹ Rose (1799), p.27.

¹²⁰ *Ibid.*

¹²¹ BL Add MS 88906/7/17, f. 5r.

¹²² Thompson (2013), pp.877-9.

¹²³ *Ibid.*

¹²⁴ Cobbett, (XXXIII, 1806-20), col. 1139.

¹²⁵ *Ibid.*, col. 1137.

¹²⁶ Hume, (1987), p.345.

¹²⁷ Cobbett, (XXXIII, 1806-20), col. 1080.

¹²⁸ *Ibid.*, col 1249.

¹²⁹ *Ibid.*

Analysis of the history of tax law and policy often focuses on their political and economic expediency. The use of indirect taxes over direct and the introduction of the IT are seen to owe more to political and fiscal need than to theoretical considerations. These factors cannot be denied, but it is also important to not lose sight of how they related to a level of discourse about taxation that focused on principles as much as practicalities. The problem of legitimacy was not solved by the use of customs and excises over the direct taxation of wealth and the limits of governmental intrusion was a constant thorn in the side of the eighteenth-century British state. Moreover, that the IT attempted to tax the people in accordance with their ability to pay was not such a radical break with one of the fundamental principles of taxation in this period. That it overcame its greatest obstacle of legitimacy is not only indicative of fiscal emergency but also that there were limits to the use of expenditure as a measure of ability – although this hurdle would not be completely cleared until the mid-nineteenth century. Tax policy in eighteenth-century Britain was not only about political and economic need; arguments for and against taxes were frequently rooted in theories of taxation and principles of legitimacy, equity, and justice. This was no different in the period of the late 1790s as income became an improved measure of ability to pay.

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Railroads and rural industrialization: evidence from a historical policy experiment

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Railroads were the key technology of the nineteenth-century transportation revolution, yet even though contemporary observers widely believed that the building of a railroad was able to ‘make or break a district or region’ (Pollard, 1981, p.129), it has remained challenging for economic historians to identify the causal impact of railroads on local economic development since they often connected already growing places. Opened in 1830, the world’s first railroad between Manchester and Liverpool highlights the central empirical problem emphasized by Fishlow (1965) that while connected places often experienced rapid industrialization such growth may simply reflect factors that attracted these investments there in the first place.

An important feature of railroad construction in nineteenth-century Europe is that the technology diffused across countries at very different stages of their economic transition: in Britain, railroads arrived *after* industrialization, in most of Continental Europe they were built *during* industrialization, while they were constructed *prior* to the industrial take-off in the Scandinavian periphery. Although Sweden lagged behind the rest of Europe in terms of industrial development by the middle of the nineteenth century, it had achieved a level of industrialization that put it far ahead of the average European country at the eve of World War I (Bairoch, 1982). Sweden’s industrialization took place against the backdrop of a state-led construction of a national railroad network that aimed to promote economic development in disadvantaged rural areas, which thus provides a useful historical setting to analyse the impact of the steam railroad on industrial development. Indeed, influential scholars such as Walt W. Rostow (1960, p.55) has emphasized the railroads as an “extremely important” factor in accounting for the industrial take-off in Sweden and Swedish economic historians have also emphasized the role of the state railroads in igniting industrial growth, most prominently in Eli Heckscher’s 1907 doctoral dissertation *On the importance of railways to Sweden’s economic development*. Aided by the increased availability of digitized census data combined with GIS software, this paper revisits the question posed by Heckscher more than a century ago: did the major state-led investments in railroads ignite industrial development and thus contribute to Sweden’s catch-up with the leading European industrializers?

To examine the impact of the state railroads, I construct a new detailed dataset on manufacturing activity before and after railroad construction took place for 1,635 rural parishes that I pair with GIS maps of the rollout of the railroad network. Difference-in-differences estimates that compare changes in industrial employment and population between 1850 and 1900 among rural parishes that were traversed by the state railroads relative to non-connected parishes show substantially more rapid population growth and structural transformation in parishes that gained access to the state railroads. Additional results importantly show that this industrial expansion did not reflect investments in other types of infrastructure networks such as electricity or telegraphs, differences in natural endowments, or a reallocation of manufacturing activity from nearby areas. A central prediction of many economic geography models, however, is that transport cost declines between asymmetric regions may have ambiguous impacts on local economic development (Krugman, 1991). Comparing the heterogeneous impact of the Swedish state railroads, I find that industrial growth was entirely confined to locations with pre-existing industrial agglomerations. A concentration of industrial growth to initially more developed areas is consistent with the argument that while the spread of the state railroads was an important catalyst of the accelerated pace of Swedish industrialization in the latter half of the nineteenth century thus

contributing to its convergence with the European industrial leaders, it did so at the cost of increasing spatial disparities.

Data

To examine the impact of the Swedish state railroads on rural economic development, I construct a new dataset for a balanced sample of rural parishes that combines population and employment data from historical parish registers and censuses for 1850 and 1900 with GIS data that capture differences in rail access. Population and employment data for 1850 are based on information reported by the clergymen in each parish to the Tabular Commission in Stockholm, the predecessor to Statistics Sweden. For each parish this source provides the number employed in industry as well as a total population count. Similarly, I use data from the full-count (100 per cent) digitized 1900 population census that contain demographic and occupational information for some 5.2 million individuals, which has been made available through the North Atlantic Population Project, to measure the occupational structure and population of parishes in 1900. Historically, the censuses were extracted from the continuously updated parish books, maintained by the priest or vicar in each parish, except for the city of Stockholm where data were based on the tax census. To measure each parish's access to the railroad network, I use GIS software to digitize maps of the railroad network obtained from contemporary publications by Statistics Sweden and historical maps of parish boundaries obtained from the Swedish National Archives. Additional control variables are drawn from the Tabular Commission data and a variety of GIS sources such as the FAO's Global Agro-Ecological Zones database and the Digital Chart of the World.

Analysis and main results

To identify the impact of the state railroads on rural economic development, I estimate difference-in-differences style regressions where the outcome is either long differences (1850-1900) in population or the share employed in industry in each of the 1,635 parishes regressed on a dummy variable taking the value 1 if a parish is located within 10 km of the state trunk lines in 1900 and 0 otherwise. In these regressions I also control for county fixed effects, as well as a range of geographic characteristics that may influence both economic development and the placement of railroads and initial industrialization and population levels.

As a first step of the analysis I examine whether areas that became connected to the network differed in terms of exogenous and pre-determined characteristics. Reassuringly, there is little evidence of differences in terms of agricultural suitability, elevation, or differences in industrialization and population growth in the pre-rail era, which suggests that the state planners did not target areas with brighter growth prospects. Although there is no evidence of observable differences, connected areas may still differ in terms of unobservable growth determinants. To mitigate such concerns I develop an instrumental variable (IV) strategy that constructs a hypothetical network that connects all the endpoints and nodes in the network along the shortest routes that generates plausibly exogenous variation in connectivity in areas that "accidentally" were located along these routes.

Table 1: *Railroads and rural development, 1850-1900*

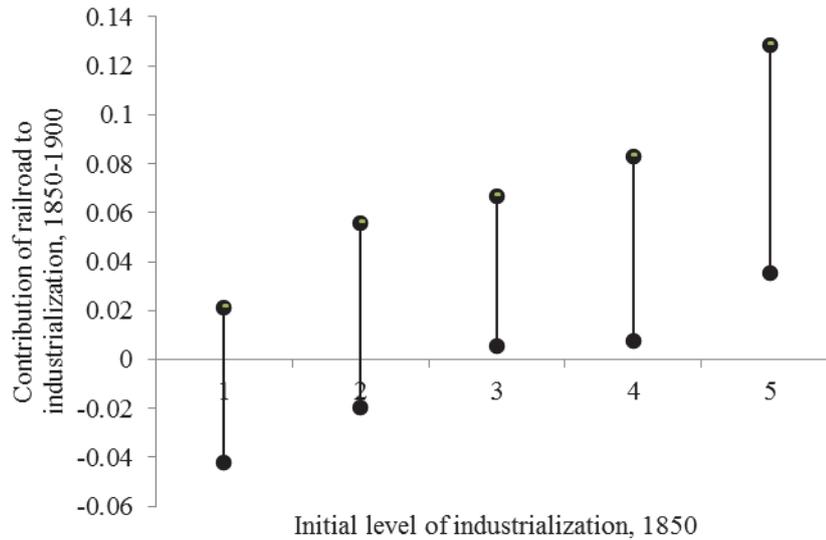
	A. Population growth, 1850-1900		B. Industrial growth, 1850 -1900	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Trunk line (=1)	0.113***	0.131**	0.031***	0.027**
	(0.030)	(0.042)	(0.010)	(0.013)
Additional controls?	Yes	Yes	Yes	Yes
County FE?	Yes	Yes	Yes	Yes
Kleibergen-Paap F-statistic	-	212.1	-	212.1
Observations	1,635	1,635	1,635	1,635

Notes: This table presents OLS and 2SLS estimates from regressing long differences in log population and the share employed in industry between 1850-1900 on a dummy taking the value 1 if a parish is located within 10 km of a state railroad in 1900. Additional controls include agricultural suitability; altitude; distance to the coast, Gothenburg, Malmö, and Stockholm; terrain ruggedness; population density and the share employed in industry in 1850. Statistical significance based on standard errors clustered at the county-level is denoted by: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 1 presents the main estimates where the outcome is long differences in population and industrial employment between 1850 and 1900 in panels A and B respectively. Panel A, column 1 shows that an average parish that was traversed by the state railroads saw an increased population growth of 12 per cent (0.11 log points) relative to more distant parishes. As shown in column 2, the instrument is a strong predictor of the actual network constructed and although a large literature emphasizes that weak instruments may bias IV estimates, the Kleibergen-Paap F-statistic in the first stage is sufficiently large to allow me to reject a 10 per cent maximum IV bias. IV estimates are similar in size or slightly larger than the OLS estimates, which suggest that the latter if anything underestimates the impact of the railroad on population growth. Together, these results suggest that changes in population can causally be attributed to the coming of the railroad thus lending support to contemporaries such as Adolf von Rosen, one of Sweden's earliest railroad proponents, who argued that "in Sweden as in America the railroad should not follow the population but the population the railroad" (Rydfors, 1906, p.40).

Was the more rapid population growth in areas traversed by the state railroads also mirrored in a structural shift towards industrial activities? Panel B presents estimates where the outcome is long differences in the share employed in industry between 1850 and 1900, showing that parishes that were located along the trunk lines also experienced more rapid industrialization over the latter half of the nineteenth century. Column 3 reports the baseline OLS estimate, which suggests that parishes located within 10 km of the main trunk lines experienced an average increase in the employment share in industry of 3.1 percentage points between 1850 and 1900 relative to more distant areas. To put this increase in perspective, it is informative to note that the average parish had 21 per cent of their employment in industry by 1900 thus suggesting that these gains were relatively sizeable. Moreover, given that connected parishes experienced more rapid population growth over the same period, these increases are even more pronounced in absolute terms. Column 4 reports IV estimates using location in the straight-line corridors as an instrument in the first stage, which yields IV estimates that are slightly smaller in magnitude than the corresponding OLS estimates. Yet, differences between OLS and IV estimates are quantitatively small and not statistically significant, which suggest that the OLS estimates are reflecting the causal effect of gaining access to the state railroads. Additional evidence using approaches to gauge how large the selection on unobservable factors must be to explain away these results as well as a series of falsification tests provide further support for interpreting these effects as causal.

Figure 1: *Distributional impacts of the state railroads, 1850-1900*



Notes: This figure shows that the spread of the railroads led to a concentration of growth in areas with pre-existing industrial agglomerations by plotting the estimated contribution of the state railroads to industrialization by the initial (1850) level of industrial employment.

A key prediction of a large class of economic geography models is that a lowering of transport costs may lead to an increased concentration of economic activity to initially more developed places, which may serve to increase rather than reduce spatial disparities (Krugman, 1991). Industrial production tends to concentrate if the relative demand for manufactured goods varies across locations, if economies of scale dictate that it is more efficient to concentrate production to a limited number locations, or if external economies accruing from backward and forward linkages or thicker labour markets are important. To examine this hypothesis, I augment the regression with interaction terms that allows the impact of the railroad to vary along the initial level of industrialization. Figure 1 shows these additional terms that reflect the contribution of the railroad to industrial growth between 1850 and 1900 by the initial level of industrialization in quintiles. As evident in this figure, the spread of railroads to areas with the least industry had negative impacts on industrialization as these areas saw a loss of industrial activity over the subsequent 50-year period, while it led to substantially more rapid growth in pre-existing industrial centres.

Conclusions

Swedish manufacturing experienced a remarkable growth in terms of employment and output between the mid-nineteenth century and the outbreak of World War I, contributing to rapid income and wage convergence with the European industrial leaders. Around the mid-nineteenth century, the Swedish state constructed the backbone of the modern railroad network that partly aimed to promote development in rural areas with poor development prospects. This paper examined the long-run impact of these state railroads using newly collected data for rural parishes. Areas traversed by these trunk lines saw substantial manufacturing and population growth, though growth mainly was confined to areas with an initial concentration of industry and favourable natural endowments. Although these result suggest that railroads were an important catalyst of rural development in nineteenth-century Sweden, they may not have been the integral factor for spreading industrialization they are widely held to be, which would surely have disappointed those contemporary Swedes' who believed that the steam railroads were 'as if by magic, to bring throbbing prosperity even to regions without any prerequisites for economic development' (Heckscher 1954, p.243).

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Factor endowments, farm structure, and rural settlement failure: a regional approach

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The understanding as to which factors forged the prosperity (or lagging) across countries is frequently traced back to colonization. The differences in the paths undertaken can partly be explained by the way crops, agricultural techniques, or farm sizes adapted to new environments.¹³⁰ This paper is a simplified approach to this adaptation process. It combines a broadly accepted, yet challenged, model within agricultural economics and the story of a settler economy at the beginning of the 1900s. Colonial history shows that the Algerian economy changed significantly during French colonization. Initially, the colonial administration expected to settle a smallholding-rural society; yet it turned out to be a speculative cash-crop production colony based on relatively large estates devoted mainly to wheat and wine. These crops, unlike pre-modern times, now enjoyed economies of scale and required relatively newer farming techniques to compete in international markets. Scholarly literature suggests that the progressive tendency towards larger estates ‘squeezed out’ settlers,¹³¹ failing to pursue what the colonial administration had initially hoped for.¹³²

This paper links the process of settlement and the relative factors of production to explain farm size and the lower levels of rural settler density.¹³³ It takes advantage of unique annual agricultural campaigns undertaken by the French administration at the municipal level in Constantine in 1904/5 and 1913/14.¹³⁴ I argue that the regional differences of the average farm size per municipality mirror what Olmstead and Rhode (1993) defined as ‘a fossil record, capturing the production choices made as the region reached maturity’.¹³⁵ These choices ultimately relate to numerous studies that rely on past local endowments or/and institutions to disentangle the causes of long term growth and inequality.¹³⁶ It permits an examination of the role of agricultural intensification and the theory of agricultural innovation, contributing to the settler-economy literature, and Gareth Austin’s ‘de-compression of history’.¹³⁷ Based on the induced innovation hypothesis,¹³⁸ it assesses technical change highlighting the role of land, labour, and capital (and their prices) as key constraints on agricultural production. In line with critics of the model,¹³⁹ it shows the

¹³⁰ Libecap and Hansen, “‘Rain Follows the Plow’ and Dryfarming Doctrine: The Climate Information Problem and Homestead Failure in the Upper Great Plains, 1890–1925”. *The Journal of Economic History* 62, 1 (2002): 86-120.

¹³¹ The fall in the rural settler density due to discouragement (never settled) or displacement (settled and left).

¹³² Ageron, *Modern Algeria: a history from 1830 to the present*. Africa World Pr, 1991.

¹³³ Relative factor endowments can explain size but not distribution. See Frankema, ‘The colonial roots of land inequality: geography, factor endowments, or institutions?’ *The Economic History Review* 63, 2 (2010): 418-451.

¹³⁴ *The Statistique Agricole, Gouvernement Général de l’Algérie*. In the colonial Archives in Aix-en-Provence.

¹³⁵ Olmstead and Rhode, ‘Induced innovation in American agriculture: A reconsideration’, *Journal of Political Economy* (1993): 100-118, pp.111-112.

¹³⁶ For instance see: Sokoloff and Engerman, ‘History lessons: Institutions, factors endowments, and paths of development in the new world’. *The Journal of Economic Perspectives* 14, n3 (2000): 217-232 or Easterly, ‘Inequality does cause underdevelopment: Insights from a new instrument’. *Journal of Development Economics* 84, no. 2 (2007): 755-776.

¹³⁷ Austin, ‘The “reversal of fortune” thesis and the compression of history: Perspectives from African and comparative economic history’. *Journal of international development* 20, no. 8 (2008): 996-1027.

¹³⁸ From the *Theory of wages* by John Hicks in 1963. In agriculture: Hayami and Ruttan, ‘Agricultural productivity differences among countries.’ *The American Economic Review* (1970): 895-911.

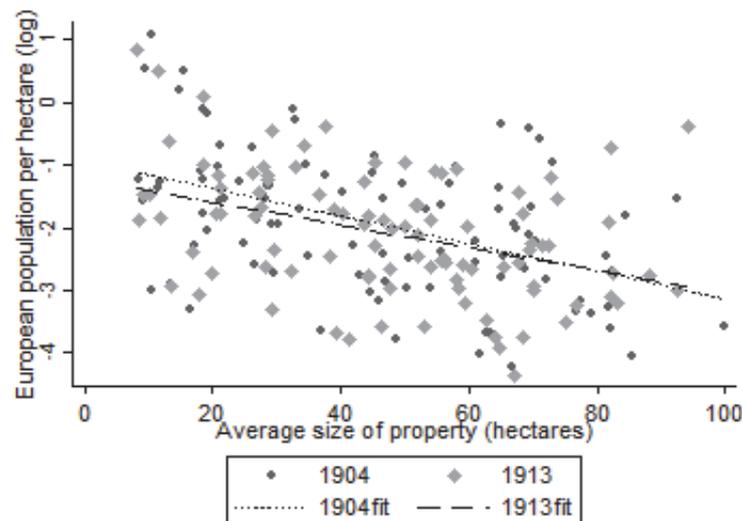
¹³⁹ Olmstead and Rhode, ‘Induced innovation in American agriculture: A reconsideration’, *Journal of Political Economy* (1993): 100-118, p.111.

importance of adding the settlement process and a set of prevailing conditions (e.g. land quality) to explain the different farming systems.

The ‘rural settlement failure’

The failure of the ‘family farm’ settlement model, shown by the progressive fall in the rural settler density, is visible in the demographical statistics; in 1872, 41 per cent of the total European population was rural, in 1900 it went down to 39 per cent, dropped to 35 per cent in 1911, and to 22 per cent by 1948.¹⁴⁰ Arguments such as: ‘French settlement in Algeria cannot thus be termed a success’¹⁴¹ or that the Europeans ‘failed to cultivate the lands’¹⁴² are frequently found in colonial history. Samir Amin asserted that the decrease of rural European population and the crowding out of small-settlers in detriment to big landowners allow classifying it as a ‘failure’.¹⁴³ In all these arguments, despite the lack of unbiased views, land concentration – more land in fewer hands – is frequently referred to as the main cause. Supporting this hypothesis, figure 1 links low levels of agricultural settler density to higher levels of average property size per municipality.

Figure 1: *Settler rural density and size of properties*



Source: *Statistique Agricole* (1904/5, 1913/14). *Gouvernement Général de l'Algérie*.

Note: European population per hectare includes owners, tenants, sharecroppers, and labourers. The average size of property is a weighted index that assigns the mean to each property size category (the largest property limit is one-hundred hectares).

Institutional framework

In line with Olmstead and Rhode (1993),¹⁴⁴ this paper relies on (and reinforces) the assumption that ‘older areas were constrained by past decisions about farm size and organization’. The reasoning is as follows. The arrival of the French shaped the Algerian land market, and settlement was organized and managed by the colonial administration (known as ‘official colonization’). The year of creation of a settlement centre reflects a progressive flexibility of the land regime regulations on property size. The year 1870 is used as a benchmark - separating the ‘older’ from the ‘frontier’ municipalities – as it experienced the transition from a military administration into a civil one. Before the 1870s the military administration prohibited territorial expansion beyond the northern settlement centres, and

¹⁴⁰ Ageron, *Les Algériens musulmans et la France (1871-1919)*. Paris, 2 (1968): 552.

¹⁴¹ Roberts, *The history of French colonial policy, 1870-1925*. Archon Books, 1963, p.229.

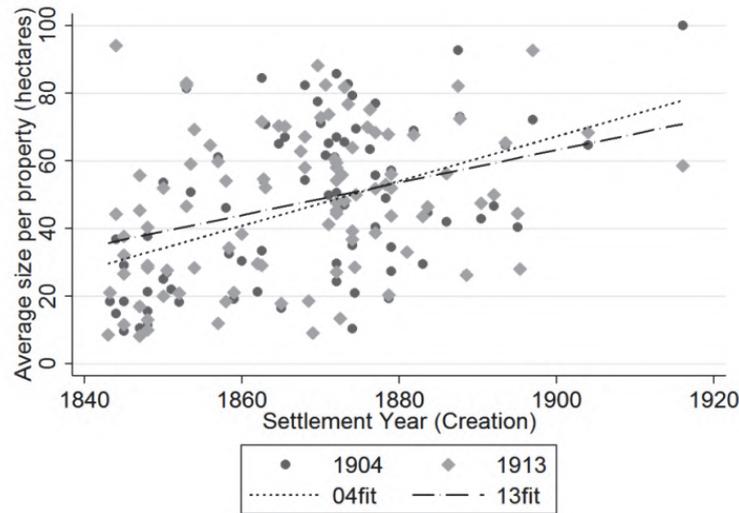
¹⁴² Sessions, *By Sword and Plow: France and the Conquest of Algeria*. Cornell University Press, 2015, p.210.

¹⁴³ Amin, *The Maghreb in the modern world: Algeria, Tunisia, Morocco*. Penguin African library (1970), p.32.

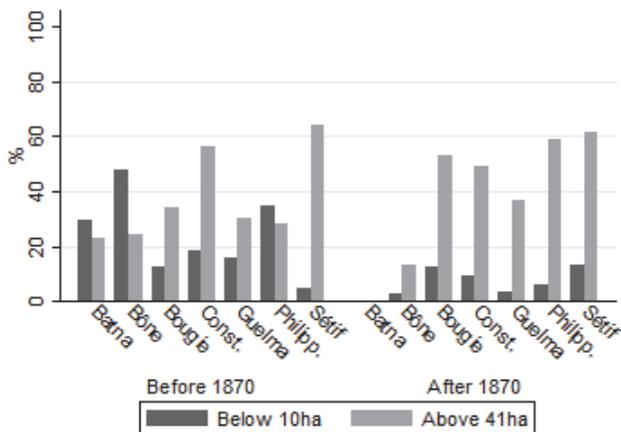
¹⁴⁴ Olmstead and Rhode, ‘Induced innovation in American agriculture’.

ownership was restricted by the government’s concessions of free small-size plots of land.¹⁴⁵ But after the 1870s the new civil administration ‘realized that large tracts of land were necessary to cultivate the semi-arid areas’¹⁴⁶ and supplied a larger amount of land (but still under land-size regulations). At the turn of the century it becomes harder to link official colonization to rural settlement due to the introduction of a land market,¹⁴⁷ a growing land scarcity, and rising crop suitability towards large-scale production. Figure 2a shows a positive relation between the presence of large ownership and the average year of settlement, as well as a boom in the number of settlements created immediately after the 1870s. The ownership share distribution (figures 2b and 2c) biased towards larger estates in the frontier areas, and small ownership was greater in the older regions (white dots in figure 3).¹⁴⁸

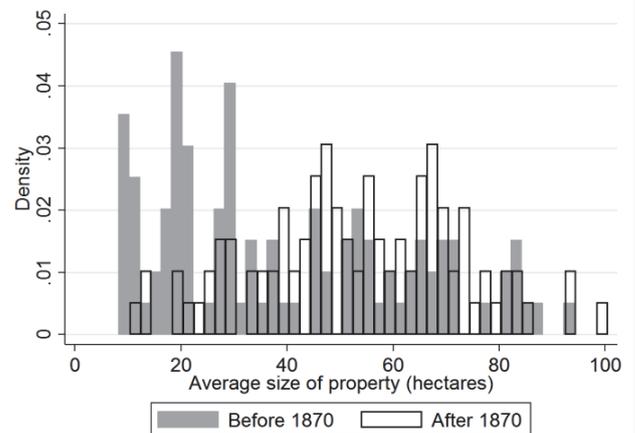
Figure 2: (a) Average property size and year of creation of a settlement centre



(b) % of small and large properties per district



(c) Average property size density



Source: *ibid.*, Note: Small is below ten hectares and large is above 41 hectares.

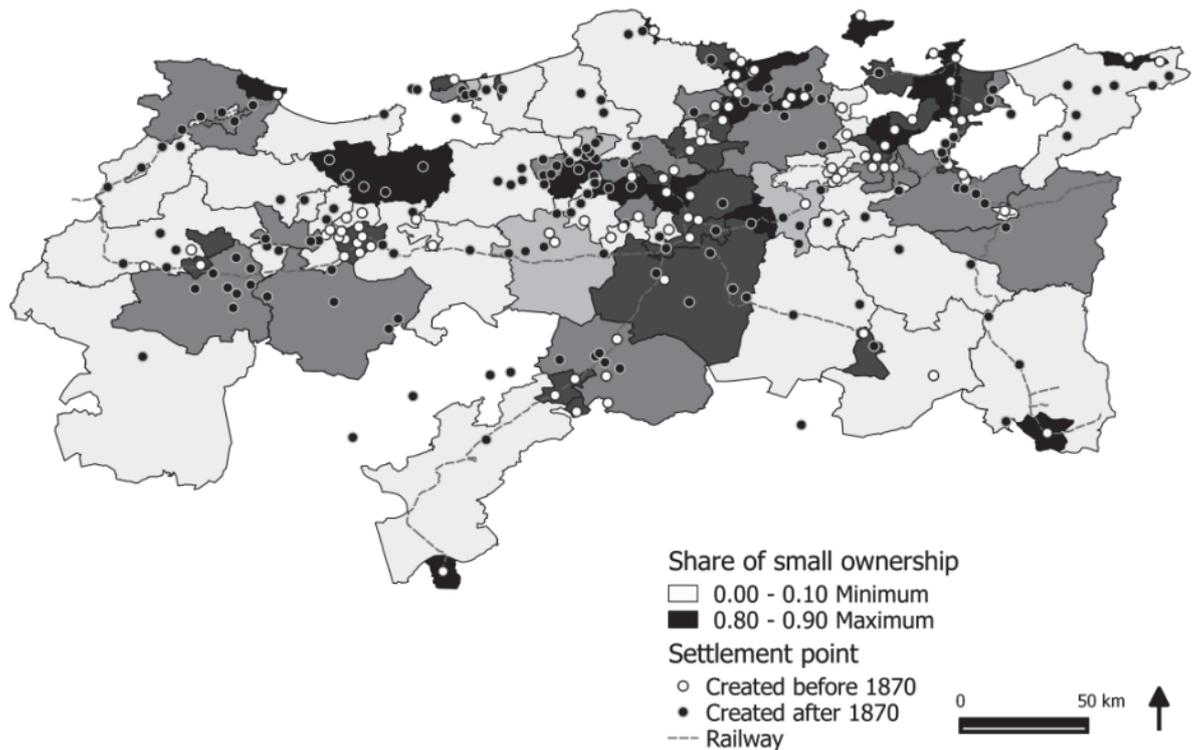
¹⁴⁵ The military administration ‘prized stability and clear channels of information-gathering, and the displacements provoked by settler colonialism were not germane to such goals’ and its ‘limited tolerance for the bourgeois ideals of private property and the free circulation of people and goods (...) complicated the picture.’ Sivak, *Law, Territory, and the Legal Geography of French Rule in Algeria: The Forestry Domain, 1830--1903*. ProQuest, 2008. p.97.

¹⁴⁶ Lützelshwab, *La Compagnie genevoise des colonies suisses de Sétif (1853-1956): un cas de colonisation privée en Algérie*. Peter Lang, 2006, p.7.

¹⁴⁷ The 1873 Warnier law began a free land market between indigenous and settlers, fragmented tribal land, and expanded the French civil code.

¹⁴⁸ The average for municipalities settled prior to the 1870s’ is of 41.06 and after is of 51.29ha.

Figure 3: *Analysed municipalities in Constantine*
 % of small properties (below ten hectares) over total number of properties



Source: *ibid.* Note: Author's own elaboration. Quantile count.

Factor endowments framework

Lack of fertile land due to its aridity was evident throughout all Algeria by the 1870s, and it was particularly problematic in the frontier regions.¹⁴⁹ The introduction of modern dry-farming techniques by the end of the 1880s enabled extending cultivation into arid and semi-arid areas. These techniques, exclusively introduced in the vulnerable-to-climate regions, allowed preserving the soil moisture but required intensive additional work to cultivate the land previously left fallow,¹⁵⁰ the use of European modern ploughs, and stronger draft animals.¹⁵¹ Table 1 indicates that the share of wheat cultivated area over the total area was greater in the frontier regions, with more than ten percentage point difference. It also shows that land prices were relatively cheaper;¹⁵² despite numerous missing observations a t-test on the mean differences shows that they were significantly lower.

The price of labour followed a similar pattern. In the 1880s as colonial production oriented towards the export market and wine prices dropped (due to its recovery), the demand for cheap indigenous labour increased. The supply was prompted after the 1870s – as a result of colonial land policies, steady indigenous population growth, and a dramatic indigenous rebellion in 1871 in the Kabyle – forcing the impoverished local populations to search for additional sources of income. The data show that the daily indigenous employment was relatively lower and more expensive in the older areas (table 1).¹⁵³

¹⁴⁹ Significant correlation between the year of settlement and the aridity level. See for Spain and aridity: Simpson. 'La elección de técnica en el cultivo triguero y el atraso de la agricultura española a finales del siglo XIX.' *Journal of Iberian and Latin American Economic History* 5, no. 2 (1987): 271-299.

¹⁵⁰ Although including fallow in the rotation dated back to the Carthaginians and the Berbers during the first kingdom of Numidia.

¹⁵¹ For detail: Lützelshwab, *La Compagnie genevoise or Ageron. L'œuvre française en Algérie (1830-1962)*. 78.

¹⁵² Average land value of one hectare of non-cleared land.

¹⁵³ Negative and significant correlation between the year of settlement and the indigenous wages per day.

Table 1: Two sample t-test mean differences

Region	Mean Prices			Quantity			Land Labour
	Land (fr/ha)	Labour (fr/day)	Machine (fr/tractor)	%CultivLand	Lab./day	Mach/ha	
Older	218.47	1.83	8,152.90	0.70	0.03	0.003	11.03
Frontier	135.87	1.64	9,707.15	0.83	0.07	0.001	5.46
P-value	0.043	0.004	0.022	0.006	0.033	0.024	0.004

Source: *ibid.*

Note: significance at 95% confidence level, assuming unequal variance. Labour is indigenous.

What about mechanization? Once we know the relative prices of land and labour, it is possible to test Hayami and Ruttan's Induced Innovation model.¹⁵⁴ If labour and land are more expensive in the older regions, and the land to labour ratio is higher,¹⁵⁵ then it is to be expected that mechanization (and land saving techniques) is also higher.¹⁵⁶ This is because technological advances are brought in to overcome factor scarcities. For example, in Algeria substituting the traditional indigenous hoe for the western one implied a higher productivity and was labour and time saving: harvesting 30 to 40 hectares required about ten labourers per month, while employing a modern reaper took two labourers from two to three days.¹⁵⁷

The data confirm the prediction: the density of all agricultural instruments per hectare was higher (particularly threshers and mechanical reapers) in the older municipalities. Table 2 shows that the number of agricultural tools per hectare (as dependent variables) correlates most significantly (and with the expected signs) to land prices, the amount of indigenous labour employed, and wages. In column 6 the dependent variable is the ratio between the number of French ploughs and the indigenous hoes used by settlers, reflecting the 'modernization' level. Finally, the prices of agricultural machines are significantly higher in the frontier regions (table 2).¹⁵⁸ Hence, in the latter it was relatively cheaper to expand the cultivated land taking advantage of a higher labour supply rather than increasing machinery.

Since farm size is constrained by the amount of land available for cultivation, and given that large properties are more common in the frontier regions (as argued previously), then property size relates to modern dry-farming. This new practice, which was limited to the less suitable areas but allowed to expand, required larger plots of land in comparison to the ones established by official colonization which were considered 'incompatible with topographical and climatological realities' and uncompetitive within the market economy.¹⁵⁹ Examining three municipalities (*Morsott*, *Oum El Bouaghi*, and *Oued Marsa*), with only properties above 41 hectares, confirms the results: i. below average levels of suitability, mechanization, and wages; ii. average, or above average, levels of the western plough (necessary for modern dry-farming); and iii. relatively high levels of cultivated area and density of indigenous ploughs (proxying for indigenous labour force). Modern dry-farming and additional institutional factors reinforced the effect on the rural settler density: the institutionalization in 1904 of open land sales permitted the new lands (now possible to

¹⁵⁴ Hayami and Ruttan, *Agricultural development: an international perspective*. Baltimore, Md/London: The Johns Hopkins Press, 1971.

¹⁵⁵ Negative and significant correlation between the year of settlement and the ratio of cultivated land over the number of indigenous labourers per day.

¹⁵⁶ Despite lack of data, Mollard (1950) argues that the use of fertilizers was limited to advanced cultivated areas. Mollard, *L'évolution de la culture et de la production du blé en Algérie: 1830 à 1939*. Vol. 2. Éd. Larose, 1950.

¹⁵⁷ Lützelshwab. *La Compagnie genevoise*.

¹⁵⁸ Proxied by price of steam tractors.

¹⁵⁹ Ruedy. *Modern Algeria: the origins and development of a nation*. Georgetown University Press, 2005, p.84.

cultivate) to be openly sold to the public and thus displacing official colonization.¹⁶⁰ This biased ownership to colons with sufficient capital, resources, and livestock for the new cultivation requirements and excluded small settlers from accessing the new lands. However, were they to be able to access, they would probably have failed due to higher climate vulnerability¹⁶¹ in comparison to large farms (such as the homestead failures in the US Great Plains).¹⁶² This should theoretically explain the small farm failure and lower rural density level.

Table 2: *Mechanization in 1904/5 and 1913/14*

	(1)	(2)	(3)	(4)	(5)
Dep. Variable:	SteamTractor	Mech.Reaper	FrenchPlow	AllTools	Modern
Labour/day_I	-10.15** (3.00)	-11.96* (5.36)	-62.05** (17.78)	-151.12** (41.18)	-0.05** (0.02)
Wage/day_I	0.74 (0.54)	0.80 (1.80)	18.41** (6.52)	25.99* (12.69)	0.02** (0.01)
LandPrice	0.02*** (0.00)	0.01*** (0.00)	0.05*** (0.01)	0.17*** (0.04)	0.00*** (0.00)
ShareWineArea	0.21 (0.83)	0.34 (1.48)	230.90*** (17.99)	472.84*** (45.00)	0.23*** (0.02)
Constant	Yes	Yes	Yes	Yes	Yes
N	137	136	136	136	137
R ²	0.72	0.10	0.70	0.66	0.66
R ² _A	0.71	0.06	0.69	0.64	0.65

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$; Cluster-robust standard errors. All dependent variables are per thousand. Instrument is the ratio between European plough per indigenous plough (used by Europeans). It includes year dummy. ‘All tools’ includes (1), (2), (3) and others such as viticulture-specialized instruments.

Conclusion

Because ‘the great grain or winegrowing properties absorbed [the small settler’s] concessions and spat out the people’, Charles-Robert Ageron argued that French Algeria lost its ‘colonial justification’.¹⁶³ What shaped, then, these properties? The agricultural data, newly used for the Constantine region at the outset of the 1900s, offer the answer by comparing regions based on the timing of settlement and the induced innovation model. The data show that the older regions comparably land and labour scarce and with higher land rents and wages, increased the intensity of advanced agricultural tools. The option of the frontier regions to expand the cultivated land was due to both the relative labour abundance and modern dry-farming techniques. These new agricultural practices, which required larger plots of land due to certain prevailing conditions – aridity and droughts, the relaxation of institutional land size restrictions, and open land sales – contributed strongly to crowding out the small rural settlers.

¹⁶⁰ Mollard, *L'évolution de la culture et de la production du blé en Algérie*.

¹⁶¹ Droughts in 1845-1850, 1866-1870, and 1881-1890.

¹⁶² Libecap, *Rain Follows the Plow*, 62.

¹⁶³ Ageron, *Modern Algeria: a history from 1830 to the present*. Africa World Pr, 1991, p.61-62.

From telegraphs to space: transport infrastructure, development and deforestation in the Amazon

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1. Introduction

The effect of transportation infrastructure on economic development has been a relevant topic in economic literature¹⁶⁵ since the 1940s. Recent rigorous empirical analyses have shed light on the extent to which transportation infrastructure actually reduce transportation costs and impact welfare. More specifically, historical routes have been used as instrumental variables for transport infrastructure¹⁶⁶ to estimate causality.

In this article, I exploit a source of quasi-random variation in observed infrastructure and develop a historical route opened by the Rondon Commission (1915-17) as an instrumental variable strategy to investigate the impact of a national highway on the development of the Brazilian Amazon region. Furthermore, I explore potential transmission mechanisms, such as deforestation. My empirical tests rely on night-time satellite data, census micro-data and deforestation satellite data.

2. Identification strategy

I exploit a source of quasi-random variation in observed infrastructure and develop a historical route opened by the Rondon Commission (RC) as an instrumental variable (IV) strategy to investigate the impact of the highway BR-364 on the development of the Brazilian Amazon region, as well as their transmission channels.

In the absence of a counterfactual in this quasi-experiment, I argue that the route of RC is exogenous to economic activity but highly correlated with the existing transport infrastructure, which allows me to choose the historical event as an IV for the road.

2.1 Telegraph lines, infrastructure and integration

By the end of the nineteenth century, the Brazilian authorities had very little information about the West of the country. The region that currently includes the states of Mato Grosso and Rondonia – 13.4 per cent of Brazil's total area – was covered by rainforest and rivers and was sparsely inhabited by unknown indigenous tribes.

The government decided to integrate the West of Brazil to the rest of the country after the Paraguay War (1864-70), by first building telegraph lines in the region. From 1907 to 1915, Marshal Rondon led the commission, inaugurating 32 stations and placing 2,270 km of telegraph lines. The so-called 'Rodon Commission' is especially noteworthy because it passed through the wilderness with very little information of this region, was a key attempt to promote national integration, and it also mapped the unknown West, opened up roads in the middle of the jungle and established the first contact with indigenous people living in that region.¹⁶⁷

The colonization of the region intended by the government faced high costs. One hundred and eighty-seven army officials and civilians died of either diseases, such as malaria,

This paper is a reduced version of a chapter of my Ph.D. Thesis obtained at the Graduate Institute, Geneva (2016). An earlier version of this paper was presented LACEA-LAMES Annual Conference 2016.

¹⁶⁵ Fogel, R. 1962. 'A quantitative approach to the study of railroads in American economic growth: a report of some preliminary findings'. *Journal of Economic History*.

¹⁶⁶ For a broad overview of the literature see Redding, Stephen J, and Matthew A Turner. 2014. *Transportation costs and the spatial organization of economic activity*. National Bureau of Economic Research.

¹⁶⁷ Schwarcz, L. 2015. *Brasil: uma biografia*. Editora Companhia das Letras.

or attacks by indigenous tribes during the Rondon Commission.¹⁶⁸

In addition, the telegraph lines encountered many technical problems. Maintenance was a challenge and the jungle grew over the telegraph stations in the 1920s and 1930s. Despite these difficulties, the telegraph lines shaped the region: in 1932, an employee of the telegraph lines wrote that if there was no telegraph line, the region would be abandoned.¹⁶⁹

The RC influenced the future of the region. In 1960, the highway BR-364, connecting Cuiaba (Mato Grosso) to Porto Velho (Rondonia), was built on top of the trajectory cleared by the Rondon Commission. The highway was only asphalted in 1983.

Despite the recognized shortcomings of the expedition in the early twentieth century, future development projects continue to be built over this existing infrastructure.

2.2 *The random route*

Based upon historiographical evidence¹⁷⁰ and supported by maps before and after the expedition, I argue that the route opened by Rondon after Diamantino – and especially after the Juruena River – was relatively random. This random characteristic of the route-building process is critical for the identification strategy, because it is exogenous to the current placement of current economic activities.

The RC departed from Cuiaba. From Cuiaba to the Madeira River – where Porto Velho is located today – the expedition opened a way in the middle of a dense forest that had never been explored before, with very limited information about the territory. The original map of Mato Grosso dated from 1880 shows that the municipality of Diamantino was the last city mapped on the route departing from Cuiaba to the Madeira River. The first part of the expedition linking Cuiaba to Diamantino was thus already pre-defined.

After Diamantino, the RC paved its own route through tropical savannah to lay telegraph lines and build telegraph stations. In eighteen months, one-third of the telegraph line had been concluded. It was after crossing the Juruena River that the RC entered ‘unknown’ Brazil, as written in the historic maps. From the Juruena Falls to the Madeira River, it was a completely unexplored piece of land.

The difficulty in knowing where exactly they were at all times is evidenced by the name given to the River of Doubt.¹⁷¹ Four hundred km north-west of Juruena, Rondon and his team ran out of food supply and did not know exactly where they were. The group found itself 100 km further up North than expected.

The path paved by Rondon shows that his route does not differ from other potential routes that he could have decided to take. Therefore, the route was random, which makes it exogenous to current economic activity and satisfy the assumptions of my empirical analysis.

2.3 *Econometric specification*

The hypothesis that I test is that areas closer to the highway BR-364 are not different from those situated further from that path if, and only if, the existence of the highway has a greater impact on the area’s current level of development when compared to more distant areas. The econometric tests suggest whether, and to what extent, investments in infrastructure explain the level of income today.

The dependent variable of my empirical tests is income. I use night-time satellite images¹⁷² and the 2010 Brazilian census. The advantage of the first approach is that it allows for more degrees of freedom than the census data, since its unit of observation is pixels

¹⁶⁸ Caser, A, and de As, D. 2011. *Fear of the sertao: malaria and the Rondon Commission (1907-1915)*. *Historia, Ciencias, Saude-Manguinhos* 18 (2): 471-498.

¹⁶⁹ Diacon, Todd A. 2004. *Stringing together a nation: Candido Mariano da Silva Rondon and the construction of a modern Brazil, 1906-1930*. Duke University Press.

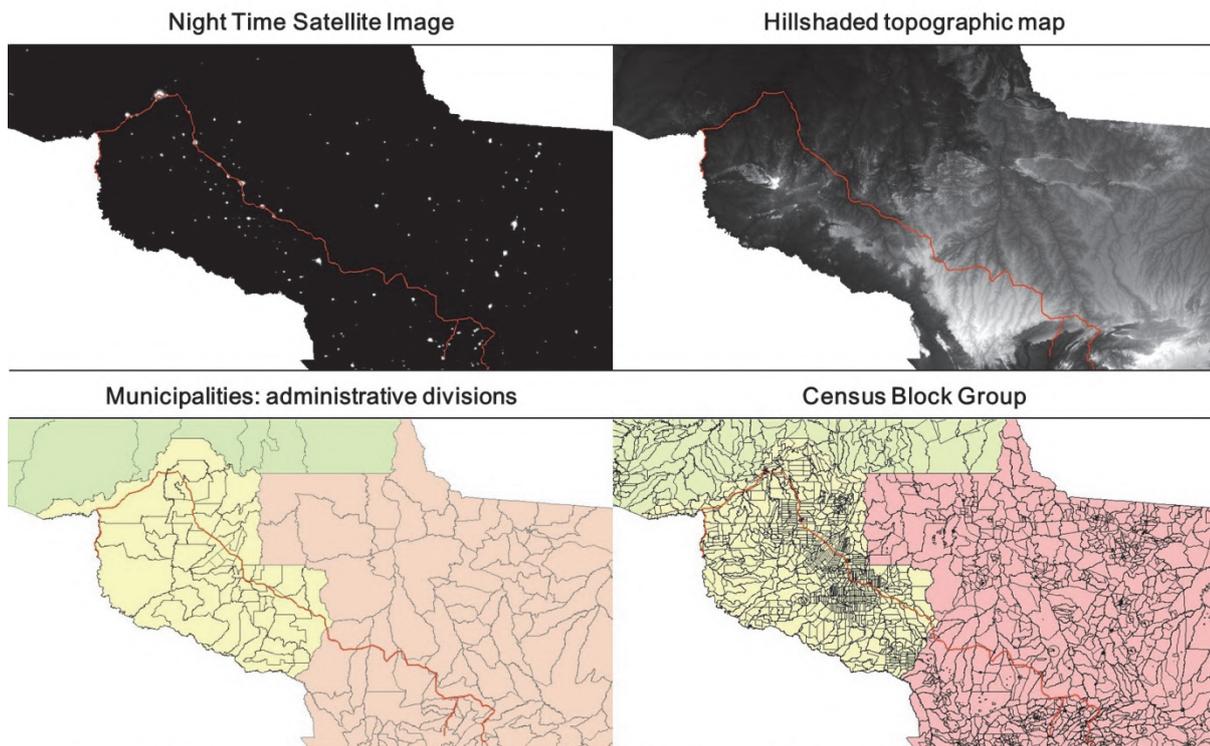
¹⁷⁰ Ibid.

¹⁷¹ Later called Roosevelt River.

¹⁷² Henderson, J., Storeygard, A, and Weil, D. 2012. ‘Measuring Economic Growth from Outer Space’. *American Economic Review*.

(approximately 0.86 km²).

Figure 1



Author's own elaboration based on the following sources: (1) and (2) National Centers for Environmental Information (2013), (3) and (4) Brazilian Institute of Geography and Statistics (2010).

The main explicative variable of my empirical test is the distance of geographical units to the highway BR-364. Given that this variable is correlated with income, I use as an IV the distance of geographical units to historical route, configuring an exactly-identified model. I calculate the distances by relying on the geographic information system, GIS.

The IV is valid since the historical route predicts recent construction of the highway, conditional upon control variables. Valid instruments cannot be correlated with unobserved variables that influence the construction of the highway. I find that Rondon's route is a good predictor of the current transport infrastructure. The selection of the control variables considers those that affected the construction of the telegraph lines and how they could potentially relate with forces that shape the current economic activity.

Considering the following two-stage least squares (2SLS) estimation, the structural model to be estimated is:

$$Y_i = \gamma_0 + \gamma_1 H_i + \gamma_2 X_i + \varepsilon_i \quad [1]$$

$$H'_i = \beta_0 + \beta_1 R_i + \beta_2 X_i + \eta_i \quad [2]$$

where Y_i is the income measure observed for entity i , H_i is the distance between the entity i to the highway and R_i is the distance between the entity i and Rondon's path. X_i includes the covariates and the error terms η_i and ε_i capture other omitted factors. The causal effect of the infrastructure investment on income is measured by the coefficient γ_1 .

3. Data

3.1 Night-time satellite images

I use night-time satellite images from the United States National Oceanic and Atmospheric Administration dated from 2013. The amount of light observed from outer space provides a granular measure of man-made economic activity that has been increasingly used in economics, more specifically in developing countries that have poor national statistical

departments.¹⁷³

The light intensity is measured in pixels. When combined with the cartographic base of Brazil,¹⁷⁴ this data allows me to capture light intensity – which works as a proxy for income. I work with intensity of light (log of one plus the original luminosity data to smooth it, varying from 0 to 4.159) and the existence of light (dummy whether that pixel has night light or not), employing both variables as a proxy for income. The maximum distance to the original track of the telegraph lines is 300 km. The dataset has 617,392 observations.

The dependent variable used in the models is income. The main independent variable is the distance between a pixel and the nearest point of the national highway BR-364. The same procedure applies to the calculation of the distance between any geographical point and Rondon's route, used as an IV.

As control variables, I consider altitude, latitude, longitude, average distance to rivers or metres of rivers by km², ruggedness¹⁷⁵ and slope of the terrain. I also control for the presence of indigenous people and different types of environmental protection units.

To capture deforestation, I use tree coverage in 2000, defined as canopy closure for all vegetation taller than 5 metres in height.¹⁷⁶

3.2 Census block groups

I rely on the 2010 Brazilian census¹⁷⁷ to collect the average household income by census block group, its smallest geographical unit. With 7,782 observations, the average household income per month is about US\$ 1,913. The advantages of using census data is that the income measure is the actual average income surveyed and that there are more control variables available. The disadvantage is that this estimation presents a lesser degree of freedom because it has fewer observations.

3.3 Municipal level

I collapse the values of the census block groups in averages by municipality to test for additional controls, namely the area of the municipality, livestock, land conflicts, malaria incidence, the relative area cultivated with soybeans and the quality of public institutions.

4. Results

4.1 Night-time satellite images

The main results are the IV estimates presented in table 1.¹⁷⁸ Column (1) exhibits the causal effect of transport infrastructure – captured by the distance between a given pixel to the nearest point of the highway – on income, measured by the intensity of night-time light. The coefficient suggests that the income of a pixel decreases by 0.029 per cent for each kilometre's distance away from the highway BR-364. When I include control variables (3) or cluster the standard errors at the municipal level (4), this effect is -0.032 per cent. Adding squared latitude and longitude (4), the coefficient drops to -0.10 per cent.

The first-stage results show strong correlation between the instrument and the observed transport infrastructure, varying from 0.80 to 0.98.¹⁷⁹

¹⁷³ Ibid.

¹⁷⁴ IBGE. 2010. *Base cartográfica contínua ao milionésimo*.

¹⁷⁵ Sappington, J. et al. 2007. "Quantifying Landscape Ruggedness for Animal Habitat Analysis: A Case Study Using Bighorn Sheep in the Mojave Desert". *The Journal of Wildlife Management*.

¹⁷⁶ Hansen, M. C., et al. 2013. "High-Resolution Global Maps of 21st-Century Forest Cover Change". *Science*.

¹⁷⁷ IBGE. 2011. *Censo Demográfico 2010*.

¹⁷⁸ The OLS estimate concludes that for each kilometre's distance away from the highway BR-364, the income of a pixel captured by the existence of night-time light decreases by 0.013%, which yields higher coefficients (-0.028%) when I use the fixed effect model that includes control variables.

¹⁷⁹ Stock-Yogo test confirms that Rondon's route is a strong IV and the robustified Durbin-Wu-Hausman tests strongly reject the null hypothesis that Rondon's route is exogenous.

4.2 Census data

I replicate the estimations using census block groups and municipality data.

The 2SLS estimates indicate that each kilometre's distance away from the highway BR-364 causes a reduction in the average household income of a census group by 2.4 to 7.5 US dollars, while the average income of a census block group in the region per year is 11,913 US dollars. The results are three to four times greater than those found previously. For instance, considering that the average income of a household is 11,913 US dollars and for each kilometre away from the highway the income decreases by 0.10 per cent, it would reduce income by 1.93 US dollars per kilometre, while the equivalent estimate for census block group is 7.5 US dollars.

Regarding the municipal-level analysis, for each kilometre's distance away from the highway BR-364, the average household income of a municipality decreases by 1.8 US dollars. This reflects a decrease of up to 0.13 per cent of the average income of a municipality in the region per year (1,369.7 US dollars).

A potential shortcoming of night-time light and census data is that land owners of the region could live in the cities located closer to the main highway. I am able to control for this possibility by adding the percentage of the municipalities' land used to grow soybeans as a control variable. The analysis show that every 1 per cent increase in its use of land dedicated to soybean agriculture is associated with a 9.4 per cent increase in the average household income. For cattle farming, this coefficient is 0.0005 per cent.

Table 1

Intensity of Night-Time Light as Income: 2SLS					
	(1)	(2)	(3)	(4)	(5)
Distance to highway BR 364	-0.000294*** (0.0000)	-0.000294*** (0.0001)	-0.000326*** (0.0000)	-0.000325*** (0.0001)	-0.00101*** (0.0003)
Constant	0.0887*** (0.00110)	0.0887*** (0.0156)	0.396*** (0.0205)	0.394** (0.193)	52.30** (20.02)
Controls			✓	✓	✓
Non-linearity					✓
Observations	617,392	617,035	608,946	608,653	608,653
R-squared	0.005	0.005	0.010	0.010	0.012
Cluster (Municipality)		✓		✓	✓

Distance to the highway BR 364: First stage					
	(1)	(2)	(3)	(4)	(5)
Distance to Rondon's route	0.9898*** (0.0006)	0.9898*** (0.0006)	0.8721*** (0.0004)	0.8722*** (0.0004)	0.8032*** (0.0012)
Constant	6.483*** (0.0818)	6.483*** (0.0818)	919.982*** (1.3317)	919.983*** (1.3317)	6593.380*** (85.5575)
Controls			✓	✓	✓
Non-linearity					✓
Observations	617,392	617,392	608,946	608,946	608,946
R-squared	0.837	0.837	0.915	0.915	0.927
Cluster (Municipality)		✓		✓	✓

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

4.3 Transmission mechanisms

I measure the impact of transport infrastructure on deforestation, a channel through which the initial investments in infrastructure made by the RC influenced the current transport infrastructure and caused changes in income in the Western Amazon. For a region, deforestation has been an alternative to extract natural resources and open areas for cattle farming and agriculture that fosters economic growth.¹⁸⁰

I replicate the same IV identification strategy. For night-time light data, table 2 shows that for each kilometre's distance away from highway BR-364, the average percentage of trees per pixel increases from 5 to 9 per cent, while this coefficient varies from 2 to 9 per cent for census group data and 2 to 3 per cent for municipal data. Therefore, the closer to the route, the higher the deforestation rate. Consistent with other studies,¹⁸¹ I observe that in indigenous areas the forest coverage by pixel is 24 per cent larger in relation to other areas, while this proportion is 10 per cent in environmental protection areas and 22 per cent in areas of sustainable use.

Deforestation is statistically associated with vector-borne diseases, such as malaria.¹⁸²

¹⁸⁰ Soares-Filho, B., et al. 2006. 'Modelling conservation in the Amazon basin'. *Nature*.

¹⁸¹ Nepstad, D., et al. 2006. 'Inhibition of Amazon deforestation and fire by parks and indigenous lands'. *Conservation Biology*.

¹⁸² Walsh, JF, DH Molyneux, and MH Birley. 1993. 'Deforestation: effects on vectorborne disease'.

The results suggest a positive and statistically significant association between deforestation and malaria.

Table 2

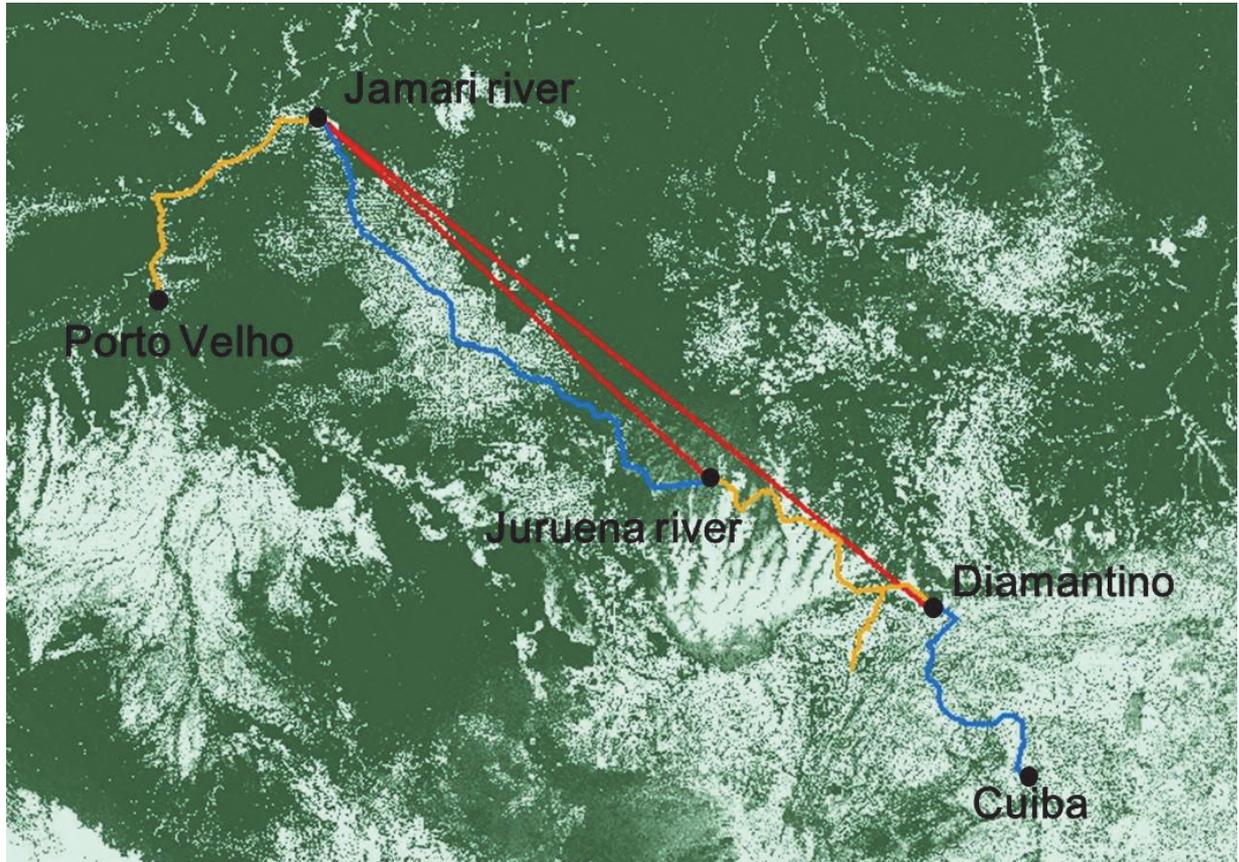
	(1)	(2)	(3)	(4)
% of Trees using satellite data				
Distance to highway BR 364	0.0706*** (0.000548)	0.0525*** (0.000619)	0.0524*** (0.0185)	0.0946 (0.0686)
Controls		✓	✓	✓
Non-linearity				✓
Observations	617,392	608,946	608,653	608,653
R-squared	0.055	0.303	0.303	0.308
Cluster (Municipality)			✓	✓
% of Trees using census block group data				
Maximum distance to Rondon's route: 300 km				
Distance to highway BR 364	0.0899*** (0.00459)	0.0642*** (0.00402)	0.0642*** (0.0167)	0.0265 (0.0304)
Controls		✓	✓	✓
Non-linearity				✓
Observations	7,782	7,745	7,745	7,745
R-squared	0.097	0.555	0.555	0.556
Cluster (Municipality)			✓	✓
Maximum distance to Rondon's route: 100 km				
Distance to highway BR 364	0.355*** (0.0201)	0.236*** (0.0185)	0.236*** (0.0522)	0.228*** (0.0763)
Controls		✓	✓	✓
Non-linearity				✓
Observations	5,314	5,279	5,279	5,279
R-squared	0.186	0.570	0.570	0.574
Cluster (State)		✓	✓	
% of trees using census data by municipality				
Distance to highway BR 364	0.0287 (0.0230)	0.0459 (0.0300)		0.0617 (0.0914)
Controls		✓		✓
Non-linearity				✓
Observations	154	76		76

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

4.4 Robustness checks

I run placebo tests to check the robustness of the empirical tests. I draw a straight placebo line from Diamantino to the Jamari River (Diamantino route). Diamantino marks the starting point of the RC into the unknown territories of the Western Amazon. Alternatively, I also draw a straight placebo line from the Juruena to Jamari River (Juruena Route), where there was only closed rainforest according to the historiographical evidence. The results of the placebo tests do not repeat the original estimates, confirming our initial results.

Figure 2



5. Conclusion

This paper exploits a source of quasi-random variation in observed infrastructure and develops a historical route instrumental variable strategy to investigate the impact of the BR-364 highway on the development of the Amazon region.

I explore different datasets and specifications to explain the causal effects of transport infrastructure on development. The results show that transport infrastructure causes economic development and deforestation. I also find that geographical variables, such as indigenous and environmental protected areas, are important to explain changes in income level.

Industrial relocation and private trade costs: how brewing moved West in the United States

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The relocation of industries in response to market integration is both an empirical regularity and a fundamental implication of economic theory. As a result, relocation plays an important role in the analysis of policies that reduce trade costs, like infrastructure development and trade liberalization. But public investments and policy are not the only source of reductions in trade costs: firms can also reduce their private trade costs through investments in transportation and distribution. These investments can respond endogenously to market size, amplifying or weakening the effect of economic policy on the location of economic activity.

In this paper I study the relocation of the American brewing industry during the late nineteenth century, when the invention of pasteurization made it feasible to distribute beer in bottles that did not need refrigeration. As a result, the marginal cost of shipping beer fell for those breweries willing to build a bottling plant. Using a novel dataset that I constructed, I observe which breweries built bottling plants during the next decades, as the share of bottling plants increased from virtually zero in the 1860s to 21 per cent in 1880 and 51 per cent in 1898 while the centre of gravity of the brewing industry moved from the East Coast towards the Midwest.

I show that this locational shift is not explained by an increase in interregional trade. In particular, it is not explained by the growth of the national shippers – six breweries that shipped beer at the national level and became the largest brewers in the industry by the end of the century, but only constituted 8 per cent of output in 1898. Instead of being explained by interregional trade, the shift towards the Midwest in American brewing was initially driven by intraregional trade. Beer output increased disproportionately in the Midwest as regional breweries adopted bottling earlier than breweries in the East Coast.

My paper contributes to the historical literature on the American brewing industry during the pre-prohibition era. Most of the literature focuses on the national shippers (Cochran, 1948; Baron, 1962; Plavchan, 1969; Kerr, 1998; Stack, 2010). An exception is Stack (2000), who studies the local and regional breweries of the time, and how they competed with the national shippers. My main contribution to this literature is to show that most of the shift in the geography of the industry in the late nineteenth century occurred through the growth of regional breweries. My historical work was made possible by the novel dataset that I collected. Such dataset includes information on output, bottling and location at the brewery level.

Sources

My data contain the output of each brewery in 1874, 1880 and 1898. Output is defined as the ‘number of barrels of beer sold and removed’ from the breweries. In addition, the data contain information on whether each brewery was bottling their beer in 1880 and 1898. My primary sources for both output and bottling are brewery directories published by industry journals of the time (*The Brewers’ Handbook for 1876*, *Wing’s Brewers’ Hand Book of the United States and Canada for 1880*, *Brewers’ Guide for the United States, Canada and Mexico 1898*). The publishers of the directories obtained their information from the Bureau of Internal Revenue, which itself collected the information in order to tax the breweries.

The population of each county was obtained from census data, which was downloaded from the NHGIS website (Minnesota Population Centre, 2011).

How brewing moved West

At the start of the 1870s, the brewing industry consisted of small breweries serving their own local markets (Kerr, 1998). Breweries distributed their beer to nearby saloons, which bought beer in barrels and sold it by the glass. Shipping beer to distant markets was prohibitively expensive due to the need of refrigeration to prevent spoilage (Plavchan, 1969, p.79). Beer had to be brewed near consumers, and consumers were concentrated in the large cities of the East Coast. In consequence, most brewing took place in the large cities of the East Coast (Figure 1).

In the late 1870s, the brewing industry moved West. Define the centre of beer production as the average of coordinates for the centroids of each county, weighted by beer output. The centre of beer production is a summary of the location of the brewing industry in the contiguous United States. In 1874, the centre of beer production was only 300 miles away from the East Coast, near Pittsburgh (PA). Between 1874 and 1880, beer production moved 53 miles towards the Midwest –77 per cent more than total population and 130 per cent more than German population (Figure 2). The movement of the brewing industry was six times faster between 1874 and 1880 than during the remainder of the century.

This substantial movement towards the Midwest occurred as a subset of breweries adopted two novel technologies that reduced transportation costs: refrigerator cars and pasteurization. Refrigerator cars prevented beer from going stale during transportation, allowing breweries to ship beer to distant markets. Despite the use of refrigerator cars, shipping beer in barrels was still expensive because breweries had to fill railroad cars with ice and set up ice depots along railroad lines (Cochran, 1948, p.163; Plavchan, 1969, p.81). Furthermore, destination markets had to be close enough to railroads to prevent beer from warming up during transportation, and large enough to compensate for the fixed costs of maintaining the ice depots required for beer distribution. Hence, refrigerator cars were mostly used to serve large markets along the rail network.

Pasteurization allowed brewers to reach smaller and isolated markets by eliminating the need for refrigeration. In 1865, Louis Pasteur patented a technique to prevent the spoilage of wine by increasing its temperature (Bowden et al., 2003, p.6). In the following decade, Pasteur studied how fermentation and spoilage occurred in beer and published his results in 1876 (Barnett, 2000). American Brewers implemented Pasteur's technique – later known as pasteurization – by submerging bottled beer into water that was gradually heated to 160 F (Baron, 1962, p.241). This process killed the bacteria in the beer and therefore prevented the spoilage of beer during non-refrigerated transportation. Hence, pasteurization allowed brewers to reduce refrigeration costs and reach markets for which refrigerated transportation was not feasible. Crucially, pasteurization required beer to be bottled because the wood of barrels does not transmit heat as well as the glass of bottles. In consequence, breweries interested in shipping beer to other markets started to bottle their beer. Pabst, which would become the largest brewer 20 years later, started bottling beer in 1875 (Cochran, 1948, p.123). By 1880, the participation of bottlers in national brewing output had reached 22 per cent.

Figure 1: *Output per county and national centre of beer output, 1874*

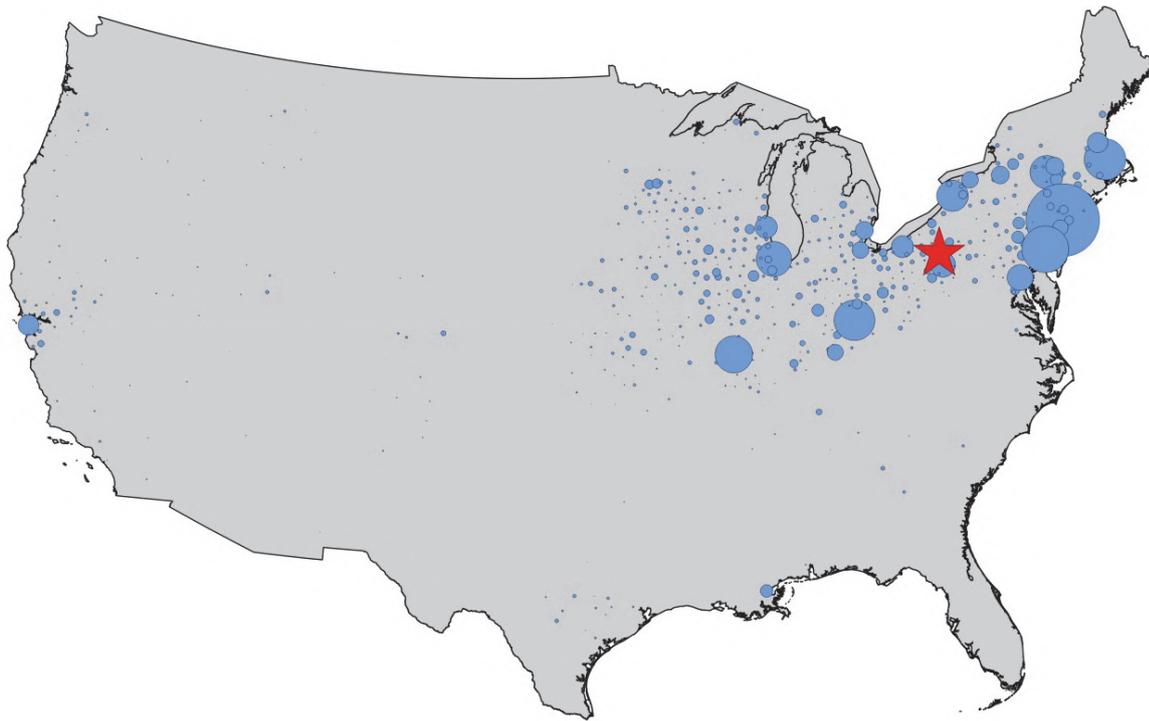
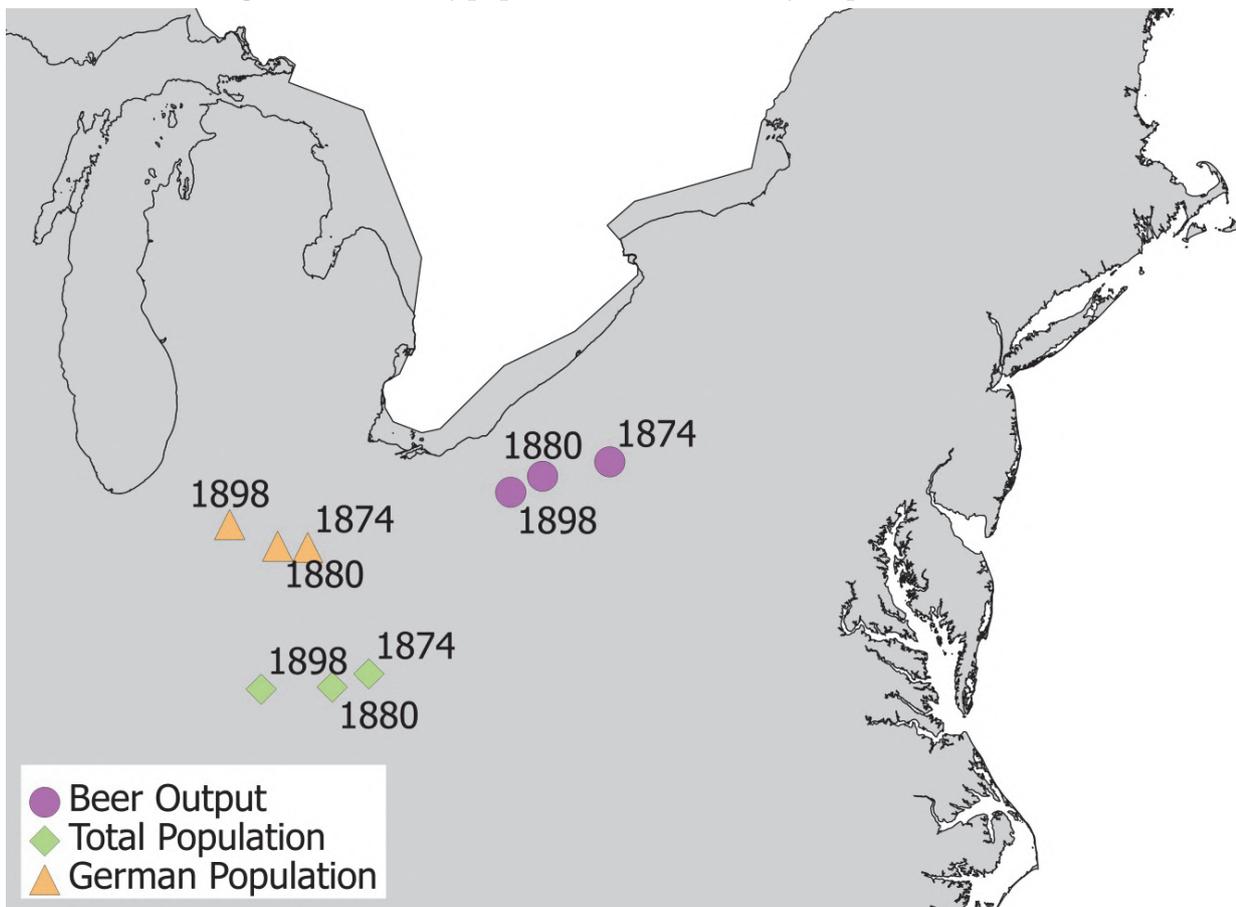


Figure 2 *Centres of population and centres of output, 1874-98*



The early adopters of bottling – and hence beer shipping – were located in the Midwest. Figure 3 shows the share of output by bottlers in each county by 1880. Bottling was frequent in multiple cities in the Midwest, but practically absent in the East Coast. Eighteen years later,

bottling was still more frequent in the Midwest than in the West Coast, although the difference was not as stark as in the early years of pasteurization (figure 4).

Brewing moved West through the adoption of bottling by breweries in the Midwest. Figure 5 compares the location of non-bottlers and bottlers, summarized by the centre of output for each group. In 1874, when almost all breweries were non-bottlers, the centre of output was located near Pittsburgh. Six years later, in 1880, the centre of output for non-bottlers remained near the same place. In contrast, the centre of output for bottlers was located 300 miles to the West, at the same longitude of Indianapolis. Because bottlers grew faster than non-bottlers, the centre of output for the brewing industry moved West. After 1880, breweries in the East Coast started to bottle beer. In consequence, the centre of output for bottlers had moved towards the East by 1898 (figure 5). However, the centre of output for bottlers remained to the West of the centre of output of the industry. Furthermore, the share of production of bottlers increased until it reached 67 per cent in 1898. In consequence, the centre of output for the industry still moved West, although six times slower than between 1874 and 1880, when most of the shift towards the West occurred.

Figure 3: Total output and bottler's share of output: county level, 1880

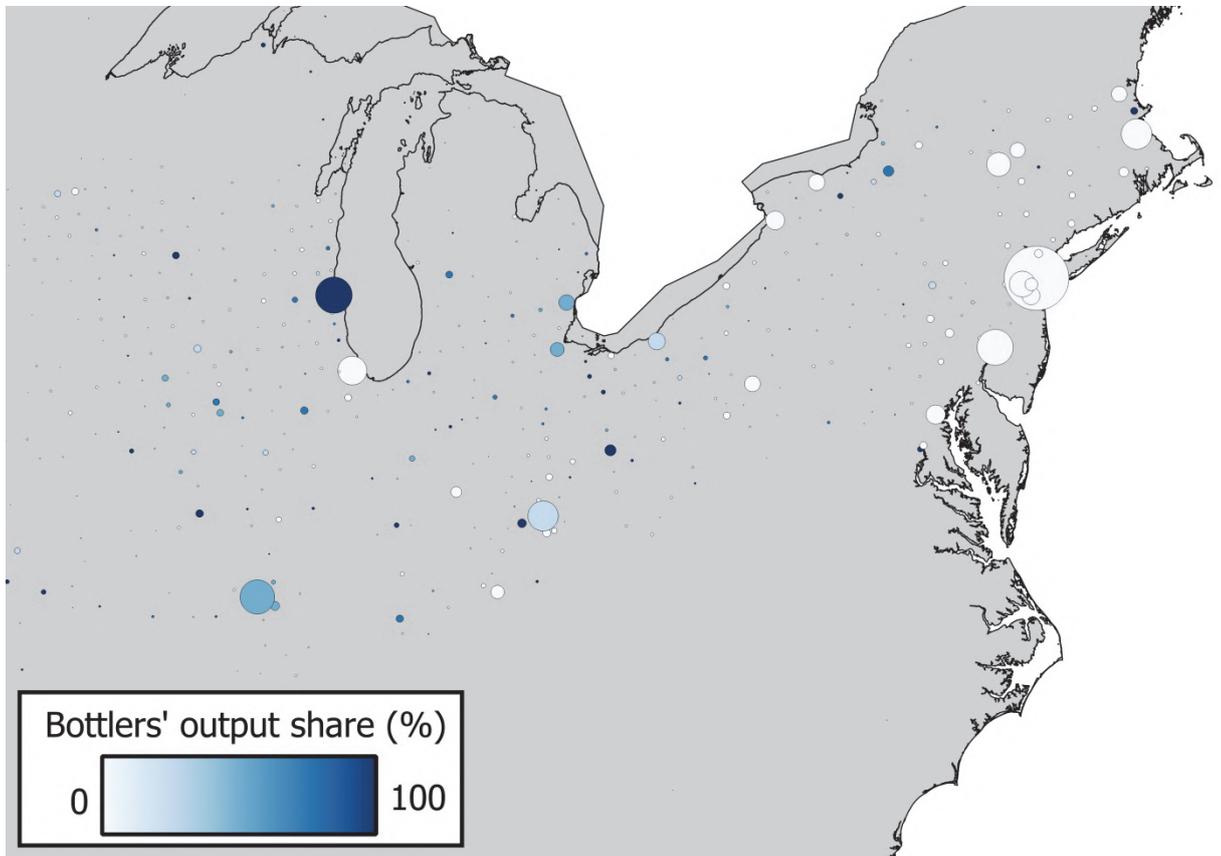


Figure 4: Total output and bottler's share of output: county level, 1880

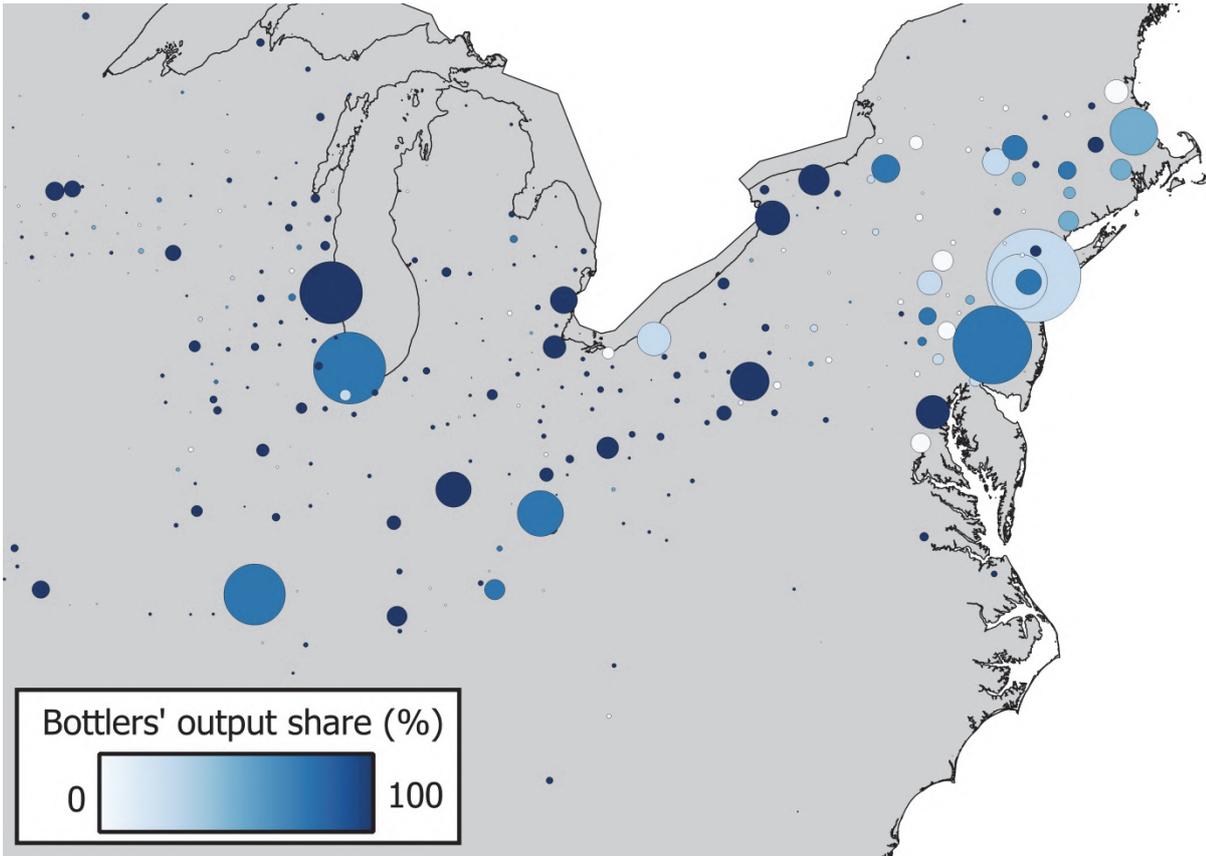
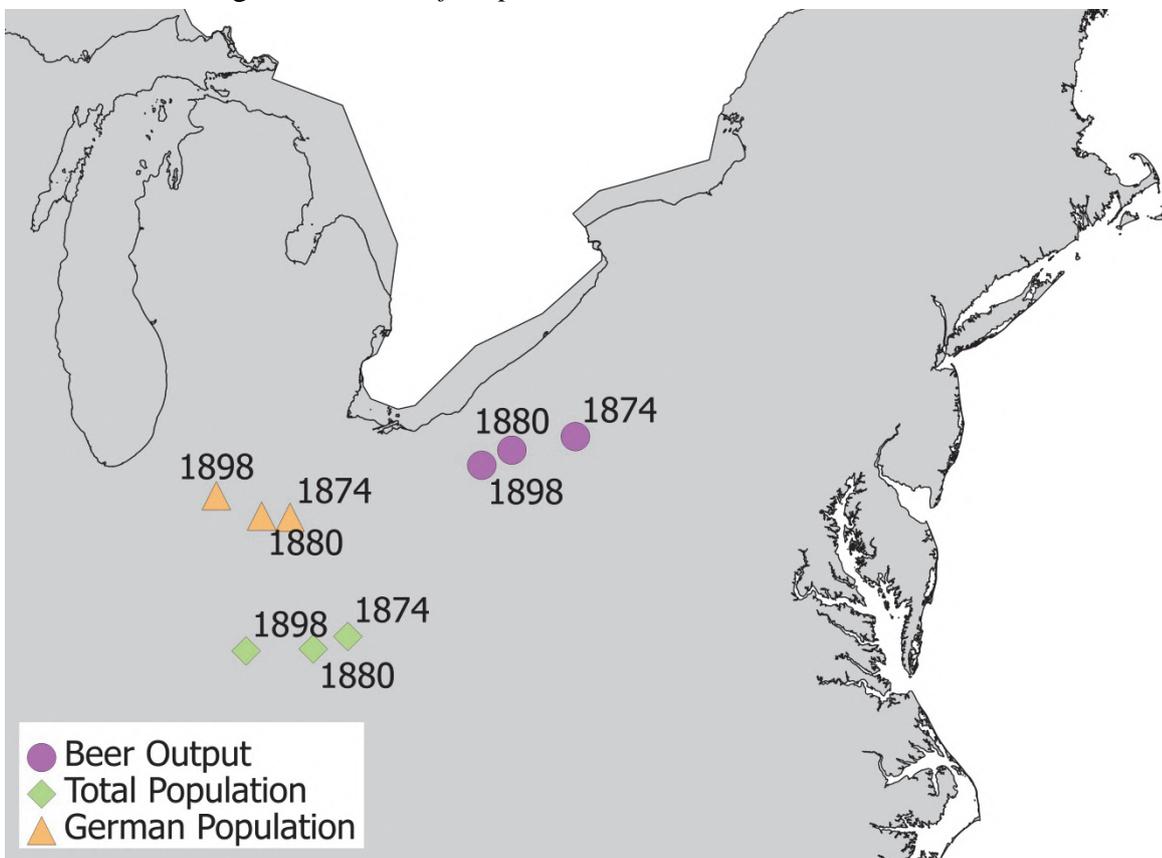


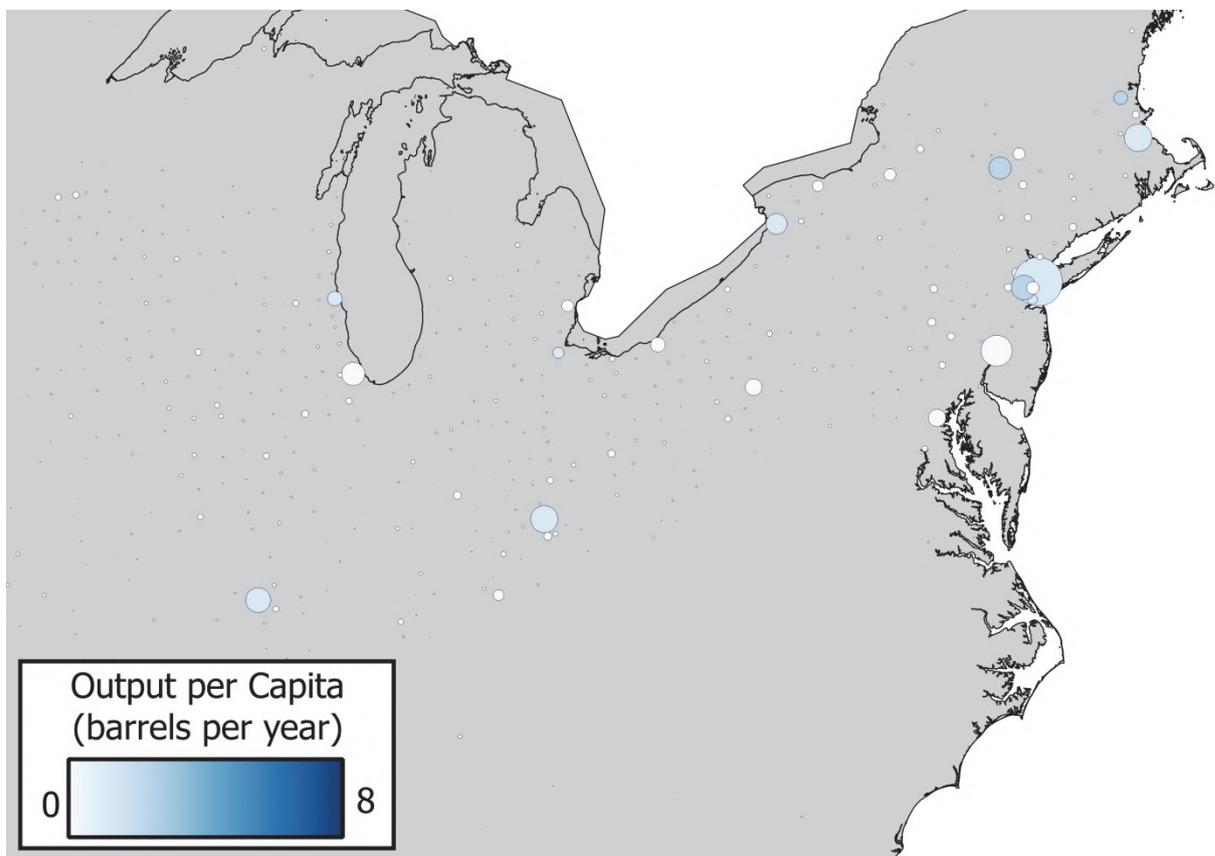
Figure 5: Centre of output: bottlers vs. non-bottlers, 1874-98



Interregional vs. Intraregional trade

Breweries bottled beer in order to ship it to other locations. One possible explanation of the early adoption of bottling in the Midwest (instead of the East Coast) is that the Midwest had a resource-based comparative advantage in the production of beer. After the expansion of railroads, the development of refrigerated cars and the invention of pasteurization, such comparative advantage would have induced breweries to ship beer to the East Coast. Indeed, a subset of breweries started to ship beer at the national level, including the East Coast (Stack, 2000, 2010). The National Shippers – as those breweries are known in the literature – were all located in the Midwest.¹⁸³ However, the size of these breweries was not large enough to explain the overall pattern of location in the industry. By 1880, when most of the relative shift between East and West had already occurred, national shippers were producing only 6 per cent of national output. By 1898, when 67 per cent of the brewers had adopted bottling, national shippers were producing only 8 per cent of national output. Furthermore, if interregional trade had induced a pattern of specialization at the regional level, beer output would have fallen on the East Coast. Instead, output per capita on the East Coast increases after 1880 (figures 6, 7 and 8).

Figure 6: Output and output per capita: county level, 1874



¹⁸³ Pabst, Schlitz, and Blatz were located in Milwaukee; Anheuser-Busch and Lemp were located in St. Louis; and Christian Moerlein was located in Cincinnati (Stack, 2000, p.439).

Figure 7: Output and output per capita: county level, 1880

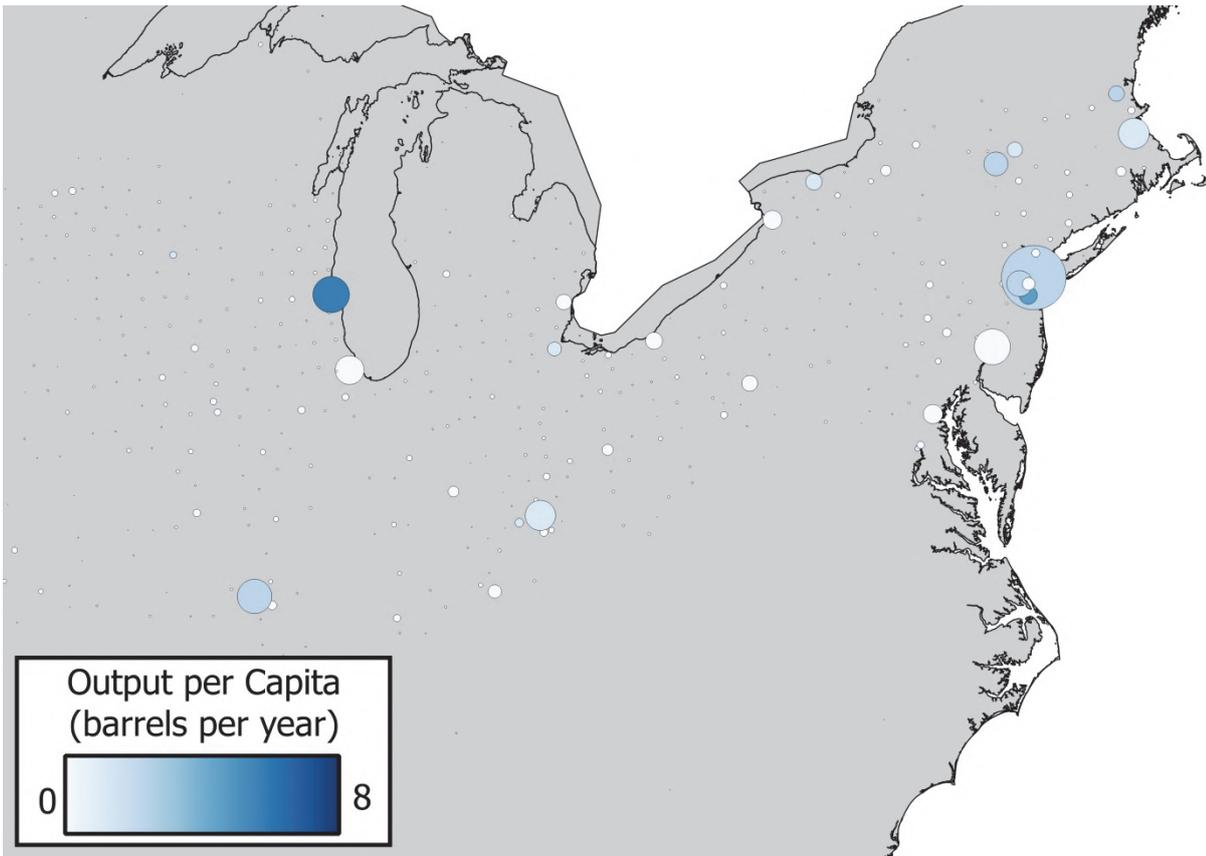
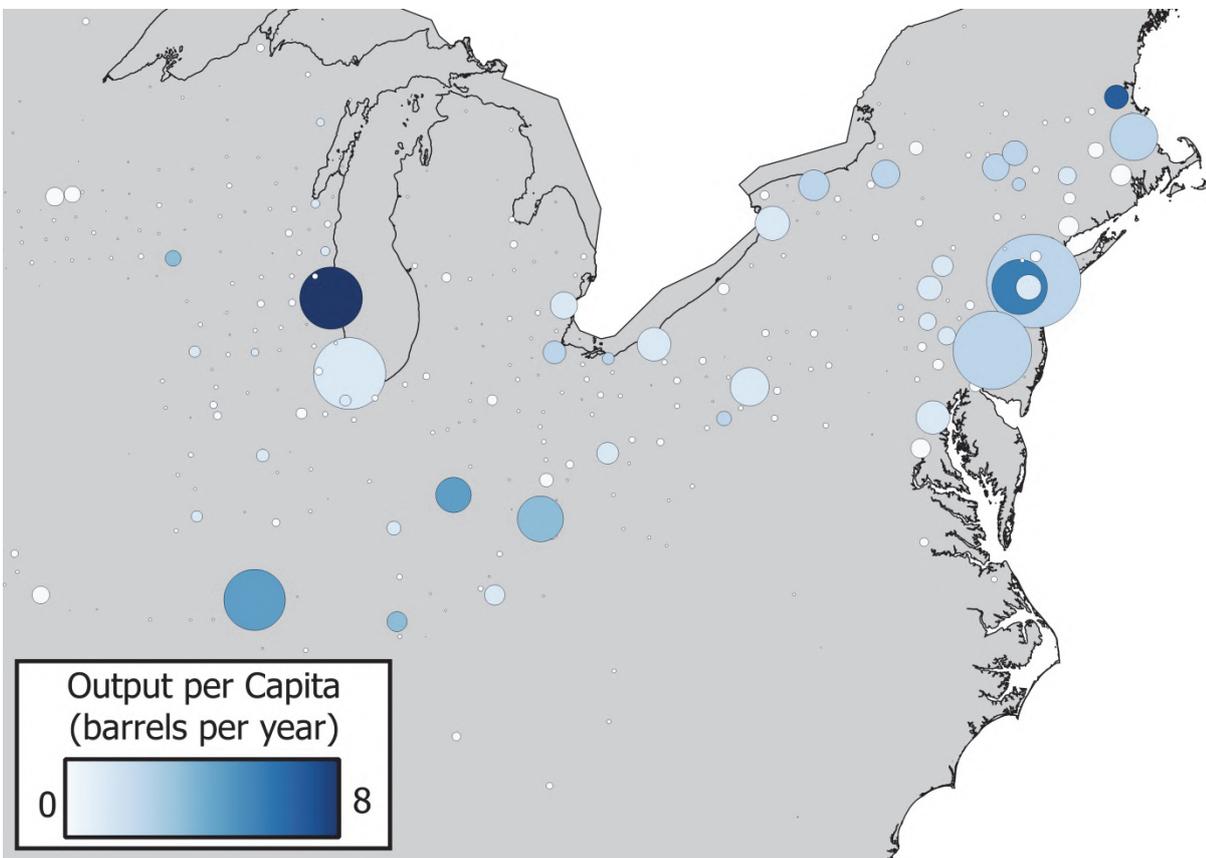


Figure 8: Output and output per capita: county level, 1898



There was no specialization at the regional level because transportation costs were much lower for grain than for beer. For example, grain was traded in international markets whereas beer was not.¹⁸⁴ The average price of barley between 1870 and 1900 in Massachusetts, New York, and Pennsylvania was only 24 per cent higher than in Illinois, Missouri, Ohio and Wisconsin.¹⁸⁵ If we take into account that as late as in the 1930s brewers were spending 50 per cent more on transportation than on grain (McGahan, 1991) a back of the envelope calculation reveals that the cost of shipping grain was at most 16 per cent of the cost of shipping beer.

While the increase of brewing in the Midwest relative to the East Coast is not explained by inter-regional trade, it is explained by a higher prevalence of intra-regional trade within the Midwest. The brewing industry in the Midwest was dominated by regional breweries taking advantage of economies of scale, whereas the brewing industry in the East Coast was dominated by local breweries using the production and distribution methods of the past. This mechanism is consistent with the early adoption of bottling in the Midwest (figure 3 above) and the large increase in output per capita in the same region (figures 6-8).

The rise of regional breweries is also consistent with the large drop in the number of breweries in the Midwest between 1874 and 1880, when most of the shift towards the West occurred. The number of firms fell by 20 per cent in Illinois, 11 per cent in Indiana, 8 per cent in Ohio, and 4 per cent in Missouri. In contrast, the number of firms grew in the East Coast: by 1 per cent in Pennsylvania, 4 per cent in New York, 11 per cent in Massachusetts, and 14 per cent in New Jersey. The large decrease in the number of firms in the Midwest is consistent with the least productive firms closing down in response to the rising competition of the regional brewers. But, why did regional brewers thrive in the Midwest but not in the East Coast?

Discussion: Why brewing moved West

Regional brewers thrived in middle-sized cities in the Midwest like Milwaukee, St. Louis, Indianapolis, Cincinnati and Toledo – not in Chicago. The lack of regional breweries in Chicago suggests a potential source of comparative advantage for other cities in the Midwest: good quality water. Quality water is a non-tradeable input that affects the taste and stability of beer. Before 1893, the primary source of water in Chicago was contaminated with sewage (Ferrie and Troesken, 2008). Breweries in cities with better water sources than Chicago would enjoy cost and quality advantages over breweries in Chicago. By shipping beer to Chicago, these breweries might be able to reach the minimum scale necessary to acquire technologies – like mechanical refrigeration and pneumating malting – that reduce marginal costs and improve the quality of beer. Low marginal costs would allow these breweries to grow in markets other than Chicago and might explain the rise of regional brewers in the Midwest. However, such a mechanism should also be consistent with the lack of regional brewers in the East Coast before 1880. In particular, the heterogeneity in water quality should be higher within the Midwest than within the East Coast. This difference in resource heterogeneity across regions can be tested in future research.

Two other mechanisms are consistent with the rise of regional breweries in the Midwest. First, breweries were more likely to ship beer within the Midwest than within the East Coast because destination markets were younger and therefore less likely to have competitors. Second, breweries in the Midwest had an incentive to build bottling plants in order to reduce their marginal trade costs and ship beer to other locations, while breweries in the large cities of the East Coast focused on their local markets and therefore did not experience the economies of scale involved in shipping beer to other counties. This

¹⁸⁴ In 1906, exports were only 0.07% of beer output, whereas imports were only 0.34% of beer consumption. Own calculations from USBA (1907).

¹⁸⁵ The data for this calculation were kindly shared by Paul Rhode. By the start of the twentieth century, localized weather shocks had limited effects on state-level prices in the price of wheat (Fox et al. 2011).

mechanism, conjectured by (Cochran, 1948, p.74), is consistent with the large growth in output of the mid-sized cities in the Midwest, as opposed to the largest cities on the East Coast – where most consumers were located. Both mechanisms can be tested in future research.

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Measuring China's performance in manufacturing: the political influence on China's early industrialization

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This study is motivated by our findings on China's early industrialization between the 1910s and 1930s when the economy gradually recovered from decades of social disorder and reached the 'golden decade' of industrialization between 1927 and 1937. The comparison on labour productivity in manufacturing shows a picture of regional divergence: Chinese manufacturing improved from the 1910s but significantly at different levels between regions. Our study follows the literature but focuses on how the regional divergence in manufacturing can be linked with these early plans of industrialization initialized in the 1860s-90s when the country was still ruled by the Qing Empire.

Researchers have already intended to trace back China's post-1949 state-led industrialization to the country's early effort towards industrialization initialized in the late nineteenth century, as discussed in Wu (2011) and Wong (2014). The uniqueness of China's industrialization is the role that the state played in driving and shaping the course of economic development. Industrialization was at the first place promoted by the Qing state's self-strengthening movement (1861-95) which aimed at catching up with the more-developed western economies and reinforcing national defences. This movement was characterized by the establishment of state-owned factories in capital-intensive industries, such as China's first iron and steel factories and the first modern textile factories, together with new infrastructural outlays, such as the railway and telegraph systems. Government interventions remained an essential part of the industrialization later in the 1930s, which was even more characterized by various government plans for industrialization in modern China. To obtain a better understanding of world economic development and the history of industrialization, China's economic situation in the late nineteenth century is important. China's path of industrialization can be used as a special case to investigate the role of the state in promoting industrialization.

This study intends to participate in the debate among historians around the Qing Empire's self-strengthening plans for promoting industrial development. Previous studies infer that the contemporary influence of the state's industrial plans on the private sector of the economy may be negligible or even negative. However, this depended on the extent and speed of the spill-overs from the public to the private sector, which are difficult to measure directly. The government-directed investments before the 1930s may have been essential for China's industrialization in the long run, such as the development of public infrastructures and efforts to promote and adopt new technologies and practices. By focusing on private manufacturing industries in a later period, this study aims to reveal one side of China's industrialization in its initial stage and evaluate the development of private industries under the clear policy orientation toward heavy and capital-intensive industries.

Data

Our investigation concerns China's manufacturing industries in the 1910s. We collect manufacturing data from the industrial survey which was organized by the Republic of China. The first survey, the Agricultural and Industrial Statistical Yearbook for the Republic of China of 1912, was published in 1914. It is the first nationwide industrial survey after the overthrow of the Qing Dynasty and summarizes the industrial achievement in the first year of the Republic of China. This survey was conducted annually until 1921. To trace changes in industries we also refer to the 1916 survey in the same series of yearbooks. The

manufacturing data in these yearbooks are based on local economic reports made at the end of each survey year and the 1912 census includes also the industrial survey of 1907-8.

The industrial survey contains quantitative information on more than 100 products and 36 major industries in the manufacturing sector and also includes data on mining and on the financial sector. The survey data are organized from details of individual plants or industrial units to those major industries. Our previous work reclassifies the 36 major industries into 11 industrial branches to match with the 1907 UK industrial census. Regional information covers 21 provinces and the capital region in the 1912 census and 22 provinces and the capital region in the 1916 census. This study uses information on gross output (quantities and values of products) for most individual products and on employment for major industries. Therefore, the sample can go from manufactured products in each region to industrial branches in each region. At this moment, the analysis is based on major industries in each region with a complete sample size of more than 700. For each major industry in each region, we calculate the change of labour productivity between 1912 and 1916.

The Chinese industrial yearbook combines factories with family workshops; thus, the calculation using output and employment data underestimates labour productivity levels in Chinese manufacturing, if labour productivity in family workshops was lower than in factories. Although it has some drawbacks, the industrial yearbook is still the most important archival record for studying early industrialization in the pre-modern Chinese economy. It provides not only first-hand information but also a comprehensive, comparable, and detailed coverage of Chinese industry in the 1910s. We can use industrial surveys in the 1930s which are generally believed to have better data quality; however, mismatching of industries and factories may cause a bias towards an overestimation of industrial development.

The data collection of the 1860s-90s self-strengthening movement involves several books, such as Chen & Yao (1957) and Xu & Wu (2003). The two book series are the most important source for us to understand the history of China's early industries, which include both qualitative information like a historical chronology of state-owned factories and quantitative information such as the initial capital of state-owned factories and railway mileage. Since we do not aim at evaluating the movement as a whole, we only pay attention to the information on the Qing state's efforts which may influence capital accumulation in manufacturing in a long run. The state's direct intervention into industrial production is our focus. Based on previous studies, our analysis further separates these industrial plans into two aspects: direct investment into private and civilian manufacturing and other investment into other sectors, such as mining, transportation, and communication. We match the state's direct investment in the 1860s-90s with the major industries in a region in the 1910s. For other state's investment which may have an extensive effect on all local industries, we only match it with a region in the 1910s. Our major interest lies in the interaction effect between the two types of investment. At this moment, we transfer the qualitative information to dummy variables. In robustness checks most of these variables will be changed into durations of the state's investment.

Our analysis also considers other explanatory variables affecting capital accumulation and the manufacturing industries in the 1910s in a long run. Based on previous studies, external circumstances were also crucial for China's early industrial development. We analyse three external factors: foreign investment in an industry before 1912, foreign settlements in a region before 1912, and regional openness to international trade. We also use the initial economic and social circumstances around 1910 as control variables. Table 1 summarizes the explanatory variables in our analysis.

Table 1: Description on explanatory variables

Variables	Description	Dummy
Before 1912		
indus_{ik}	The state's direct investment, industry i, region k	Y
infas_k	The state's direct investment in transportation and communication, region k: railways, telegraph, and ship building	Y
mining_k	The state's direct investment in mining, region k: coal and iron	Y
milita_k	The state's direct investment in military production, region k	Y
nregion_{ik}	Total number of plans of industrialization, unweighted, region k	
trade_k	Treaty ports, region k	Y
forinvest_i	Major foreign investment, industry i	Y
yforsettle_k	1912- the start year of the first foreign settlement, region k	
beforeindus_{ik}	Major manufacturing production before 1895, industry i, region k	Y
volumetrade_k	Average trade volume, treaty ports in region k, 1873-1912	
taxtrade_k	Average Tax revenue, treaty ports in region k, 1873-1912	
likin_k	Average annual likin revenue, region k, 1869-1908	
Other initial circumstances around 1910		
popden_k	Population density, region k, 1911	
factory_{ik}	Total number of factory, industry i, region k, 1912	
coal_k	The change of per capita coal used in manufacturing, region k, 1912-6	
finance_k	Total number of financial institute, region k, 1912	
pubexpen_k	Public expenditure, region k, 1911	

Methods

We first derive the dependent variable which measures the change in labour productivity. To better serve our purpose of analysis, the measure should be comparable both across time and space. We apply the new method developed in Inklaar & Diewert (2016) to calculate comparable output value. The estimate of real gross value of industry i in region k is defined by deflating nominal gross value by purchasing power parity (PPP). The PPP for industry i in region k is the unit value index in a specific period relative to an ‘artificial’ region that has gross output shares equal to the average output shares across all regions and periods and has log prices equal to the average log prices across all regions and periods. We could use other indicators of regional economic development, such as average per capita GDP estimates for 1914-8. Since we focus on capital accumulation and manufacturing industries, labour productivity better fits into our study. Moreover, the divergence and convergence of industrial development among regions is our research focus; thus, the indicator should also measure growth patterns across time and regions.

We define the change of labour productivity between 1912 and 1916 in industry i and region k as follows.

$$Y_{ik} \equiv \Delta LP_{ik} \equiv LP_{ik1916} - LP_{ik1912} \equiv \frac{Y_{ik1916}}{L_{ik1916}} - \frac{Y_{ik1912}}{L_{ik1912}}; i = 1, \dots, I; k = 1, \dots, K \quad [1]$$

where Y_{ikt} defines as real gross value of industry i in region k in period t and L_{ikt} defines as employment of industry i in region k in period t, for $t = 1912, 1916$ (Inklaar & Diewert, 2016, Equation 13, p.429).

Our analysis also continues to define the above dependent variable as a dummy.

$$y_{ik} \equiv d_{\Delta LP_{ik}} \equiv \begin{cases} 1, & \text{if } \Delta LP_{ik} > 0 \\ 0, & \text{if } \Delta LP_{ik} \leq 0 \end{cases}, i = 1, \dots, I; k = 1, \dots, K. \quad [2]$$

To evaluate the long-term effect of the state's industrial plans on manufacturing, we set a regression model under the hypothesis whether the region involved in the state's industrial plans in the self-strengthening movement performed better in the future. Our study intends to identify the difference of labour productivity between regions. To reveal the causality between industrial development and the state's promotion strategy, future research will still be necessary.

Previous literature on China's industrialization in the late Qing period discusses major developments and achievements individually, such as the self-strengthening movement and the external influence on domestic industries. Different from these studies our analysis evaluates the state's industrial plans conditionally on external influences. We also try to draw attention to an industry-region combination and possible interaction of Qing's industrial plans. Some state's investment was directly toward private manufacturing in a region, such as textile industries in Jiangsu Province. Most of the state's investment went to military and machinery production and also infrastructure construction in a region. We use international trade to indicate the major external influence on domestic manufacturing. Other foreign influences are treated as controls. For instance, most foreign direct investment into manufacturing started after the first Sino-Japanese War in 1895. We construct the regression model as follows.

$$y_{ik} = \alpha X_{indusplan_{ik}} + \beta X_{trade_{ik}} * X_{indusplan_{ik}} + \gamma X_{foreigninfluence_{ik}} + \delta X + \varepsilon_{ik}$$

where:

$$X_{indusplan_{ik}} = (1, indus_{ik}, region_k, indus_{ik} * region_k)$$

in which $region_k = (infas_k, mining_k, milita_k, rregion_k)$;

$$X_{trade_{ik}} = trade_{ik};$$

$$X_{foreigninfluence_{ik}} = (forinvest_i, yforsettle_k, forinvest_i * yforsettle_k). \quad [3]$$

Although this analysis is preliminary, we try to solve endogeneity in a certain extent. First, it is highly possible that the region eager to participate in plans of industrialization already has a certain foundation for industrial development and supports the idea of industrialization beforehand. We add a control variable measuring whether a specific industry was already a major production activity in a region in the early Qing period and before the 1890s. The volume of foreign trade may also show the general level of regional economic situation. Second, local magistrates in a region may support industrial development but lack the financial capacity to implement a policy, such as investing in a state-owned factory. Although lacking the data on early local public revenue and expenditure, we include two proxies for local financial capacity, customs tax revenue on foreign trade and likin revenue on domestic trade.

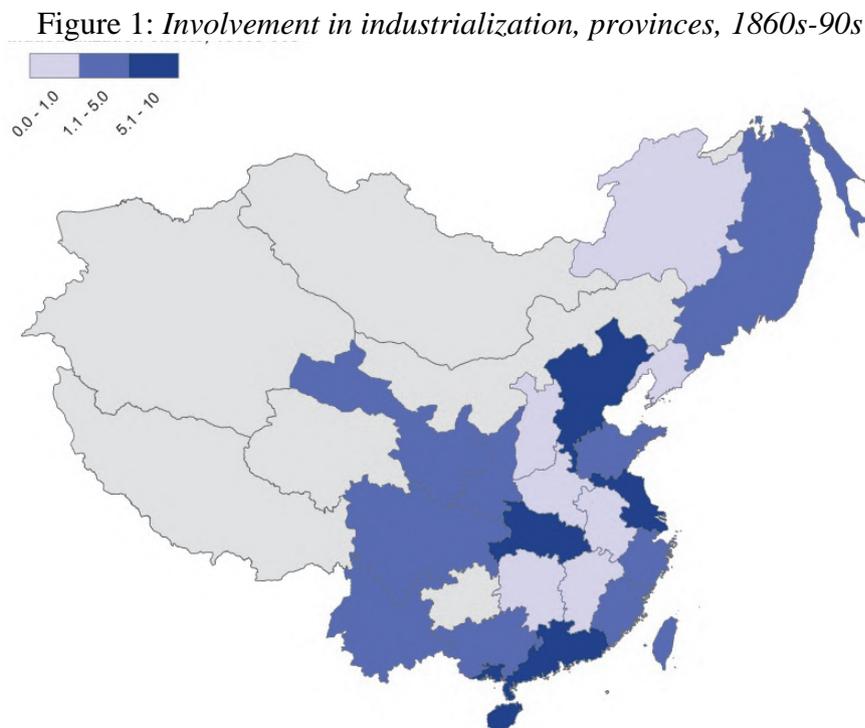
Results

Our regression analysis confirms the positive influence of the Qing state's efforts on industrialization in a very limited range; not all the direct investment plans effectively promoted later development in manufacturing. The regression model without identifying the regional difference in foreign trade shows that the influence of regional specific investment plan is more significant than that of industrial specific investment plan. Considering the region investing into infrastructure, the targeted private industry does not perform significantly better than other private industries. Considering then the targeted private industry, its performance in a region with infrastructure investment is better than a region without such investment. As expected, the state's direct investment into transportation and communication shows a significant and positive influence among other regional specific investment plans in our analysis.

The interaction effect between state-initialized industrial plans and openness to international trade is also critical in this study. We find that a region participating in both international trade and the state-initialized plans of industrialization had a better chance to experience a faster development in manufacturing later, although the influence of international trade is more significant. Considering the targeted private industry in regions involved in foreign trade, its performance in a region with infrastructure investment is not significantly different with that in a region without such investment.

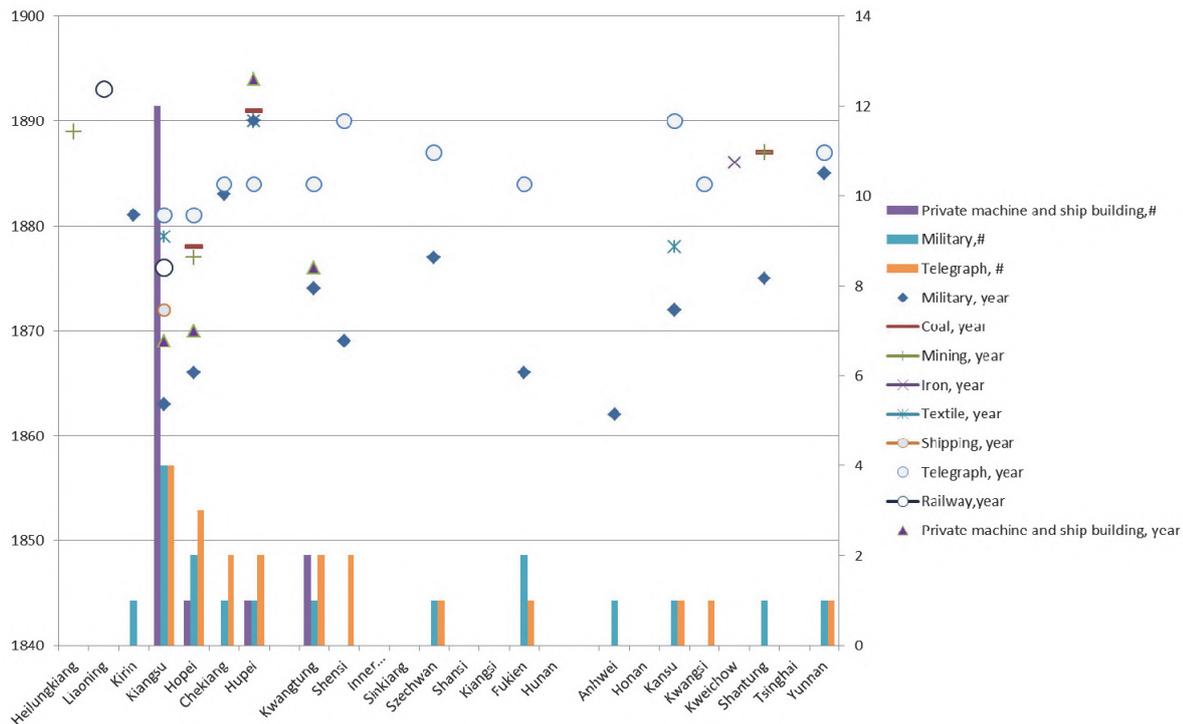
Here, we still need a generalized measurement for regional specific investment plans which better indicates the level of participation into industrialization in a region. As figure 1 demonstrates, until the late nineteenth century the state's efforts on industrialization had actually spread to most regions in Qing China, but the coverage had been unevenly distributed among regions. Using the above regression model, we find that those regions with more industrial plans have a better potential for future industrial growth. Figure 2 shows a similar relationship with per capita GDP in 1914-8. We may infer that the capacity of the Qing state in the late nineteenth century may have been largely below the 'optimum' required by the size of Qing China. Although the Qing state did try to perform its developmental role for modern economic growth, its failure seems to have been inevitable.

Understanding what drives a region to adopt plans of industrialization is actually another research interest in our study, which can provide another measurement of the level of regional involvement in industrialization plans. As discussed in some case studies on state-owned factories, financial constraints were at the centre of consideration when an industrial plan was initialized. Regional financial capacity and its interaction with the central government may help to explain the potential of a region to participate in industrialization. Among all the other categories of local public revenue, total domestic tariff income is one of our central interests. Meanwhile, the change of social circumstance may also urge or deter a region to promote its industrial production, such as wars and social disorders.



Sources: The map gives a simple summary of the qualitative information in Chen & Yao (1957) and Xu & Wu (2003) about the self-strengthening movement. The map data are from China Historical GIS data V4 for 1820.

Figure 2: The state's direct investment in various industries and services, provinces, 1860s-90s



Sources: Same as in figure 1. The regions are sequenced down into three groups according to regional per capita GDP estimated in Caruana-Galizia & Ma (2016).

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Risk mitigation and selection under forward contracts: nineteenth-century Indian indentureship

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Millions of workers migrate around the world under forward contracts as guest workers or another form of bonded labourers. For example, millions of *Gastarbeiter* (guest workers) entered West Germany from the 1950s - 1973. Many developed countries maintain guest worker programmes today such as the US temporary worker programmes under the H2-A and H2-B visas, and there are calls to expand these visas. The *kafala* system in the Middle East ties many foreign workers to an employer for a specified period of time. Previous scholarship has studied remittances, return migration decisions, and the effects of recipient-market conditions such as minimum wages or employer transitions (e.g., Naidu et al. 2015, Yang 2006, Yang 2008, McKenzie et al. 2014). However, *why* people select these contracts remains understudied.

Volatility may explain take-up. Jayachandran (2007) shows that volatility due to productivity shocks and poor insurance markets dampen wages and raise the returns from migrating. On the other hand, uncertainty in the recipient market and an inability to insure against this uncertainty may prevent migration even when there are high returns (Bryan et al. 2014). Uncertainty may break a competitive wage market and lead to share-cropping (Stiglitz 1974). Volatility is an important concept in other fields. In international trade, exchange rate volatility is studied because of its potential impacts on trade flows due to uncertainty. Policy uncertainty can harm the overall economy by causing drops in investment, output, and employment (Bloom 2009, Baker et al. 2015). I combine the labour-market structure of guest workers and the conceptual issue of volatility and ask, how does origin-market uncertainty affect out-migration under forward contracts?

To my knowledge, this paper is the first to study the general topic of origin-market volatility on migration, as well as the use of forward contracts in particular. I turn to a setting with guaranteed forward contracts abroad and uncertainty in the home market in order to identify cleanly the role of uncertainty: Indian indentureship in the late nineteenth/early twentieth centuries. Over one million Indians became indentured servants to colonies as far away as Jamaica, South Africa, and Fiji over several decades, which provides variation in time, space, and contract.

Volatility in prices and wages created uncertainty about economic outcomes in India. On the recipient side, the Indian and recipient colony governments set up indentureship contracts by law. Government-sponsored indentured immigration supplanted free migration in order to satisfy labour demands while creating credible contracts. Potential Indian migrants to participating colonies were either required to pay the passage themselves or sign on to government-overseen indentureship contracts. Private contracts, which typified colonial English American indentureship, were illegal. Hundreds of licensed recruiters spread around India enrolled workers on a rolling basis throughout a year. Unlike similar migration to Assam's tea estates, very few individuals went as paid passengers.

Contracts specified the length of time, usually five years; a fixed wage for the categories of men, women, and children; food, housing, and medical benefits; and the provision of additional benefits at the end of the contract. Remarkably, the contracts were of long duration and there were only minor legislative changes over time in pay. Contracts did vary across colonies, though. Like master-servant contracts in the United Kingdom proper, breach of the indentureship contract was a criminal, not civil, offence.

I hypothesize that Indians chose to use indentureship as a risk-mitigation mechanism to smooth consumption over time in response to local (i.e., Indian) uncertainty. Furthermore,

I hypothesize that variation in Indian uncertainty, measured here as price volatility, induces much of the selection and variation in the indentureship population. My approach differs from migration work in developed countries (e.g. Kennan and Walker 2011) and also developing ones. Risk aversion provides a new parameter of interest, sending-market consumption volatility, that enables me to examine how both the first and second moments of consumption affect migration. This also adds to contemporary research on Indian migration, risk, and networks (e.g. Rosenzweig and Stark 1989, Munshi and Rosenzweig 2016).

I collect unique microdata on roughly 250,000 Indian indentured servants to multiple colonies to test the model's predictions. I digitized individual-level data from the emigration passes of all 60,000-plus indentured immigrants to Fiji held by the National Library of Australia. I have also digitized repatriation and mortality records through 1915 for the return-migration analysis. I digitized data from the last 12 years of Jamaica's indentureship from original records held by the National Archives of Jamaica. I obtained data for Natal and Suriname from the University of KwaZulu-Natal and the Dutch National Archives, respectively. I also collated aggregate statistics from Indian districts and several colonies, including data newly digitized for this project.

I aggregate emigrant data at the year-district level of departures to examine changes in outflows given price and wage changes. I focus on sending districts that ever sent one migrant. This reduces the problem of differing institutional environments and distances from ports that could differentiate districts that did send migrants from those that did not. Figure 1 shows the geographic distribution of districts that ever sent indentured immigrants to Fiji, Jamaica, Natal, or Suriname. Figure 2 shows the average monthly rupee wage in India, weighted by actual departures, compared to the take-home wages in the recipient colonies I study.

Figure 1

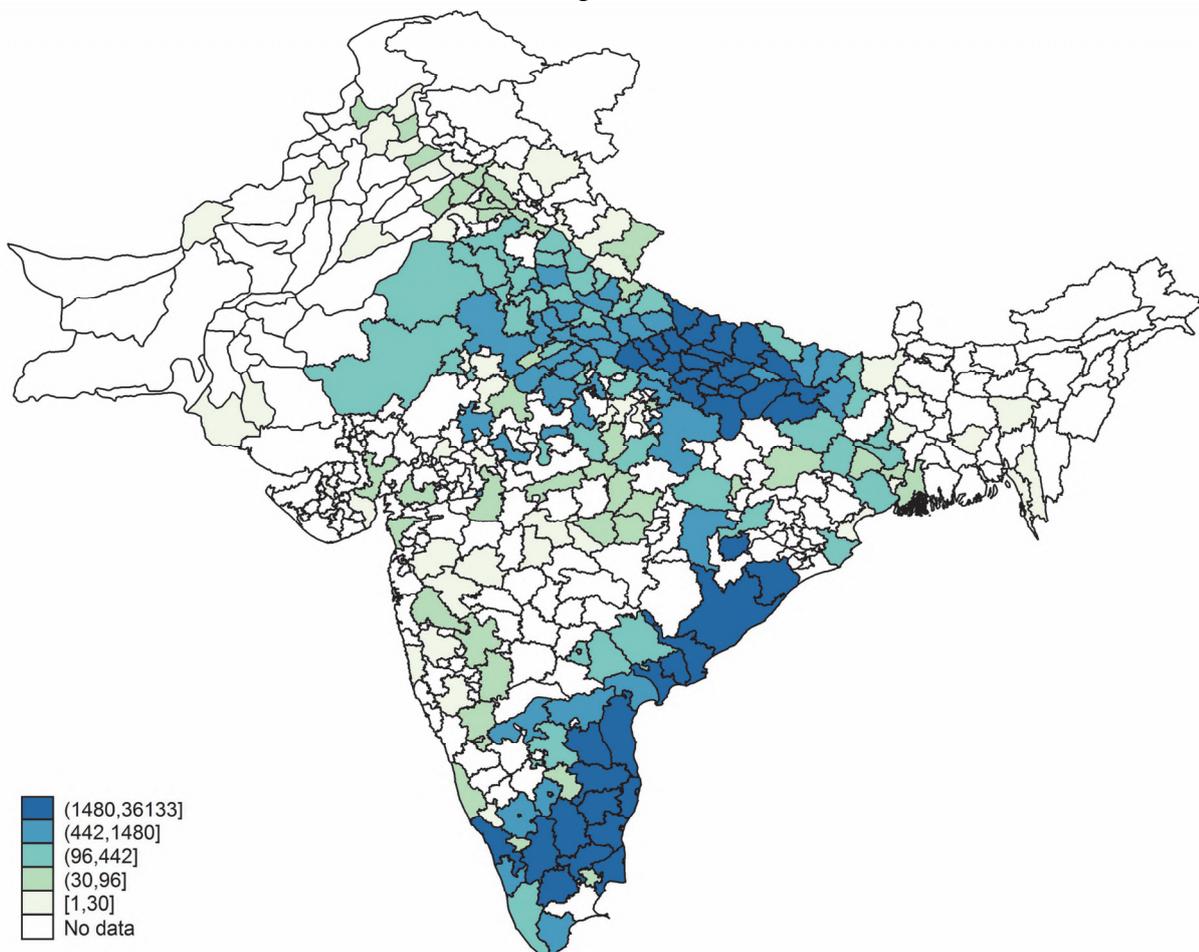
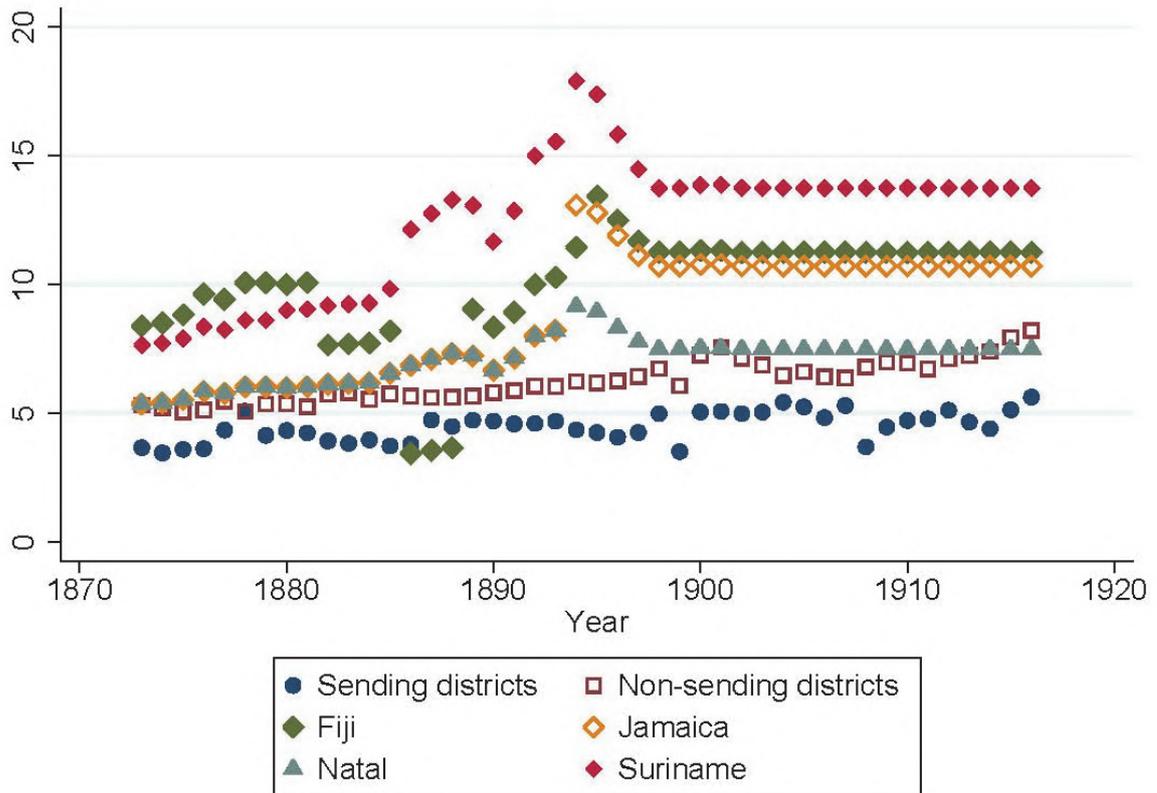


Figure 2



The functional form of volatility relies on adaptive expectations in which past realizations of price and volatility affect the expectation of the future outcome. This approach is similar to prior literature in finance and trade (see, for example, Tenreyro 2007). Volatility for district j in year t is the first difference of the logarithm of annualized prices p over the past m periods. Formally,

$$v_{jt} = SD[\ln(p_{j,t-m+1}) - \ln(p_{j,t-m})], m = 1, \dots, 5 \quad [1]$$

To justify this, I run autoregressive models of log rice price with one lag using my dynamic panel. Despite having 40+ years of data, consistency may be an issue with a static model because prices show autocorrelation. The equations are a simple autoregressive process:

$$y_{jt} = \rho y_{j,t-1} + \gamma_j + \delta_t + \epsilon_{jt} \quad [2]$$

where j indexes the district, t indexes time, and y is the log of rice price. I take the first difference in order to use the Arellano and Bond (1991) GMM estimator. For both equations of interest, ρ is positive, significantly higher than 0, and significantly lower than 1, which implies stationarity and autocorrelation. Overall, this shows that past price realizations can be used correctly as part of a forecasting model.

Table 1 gives summary statistics for districts. I separate annual prices and wages into those from sending and non-sending districts. (A non-sending district is a district that sent zero migrants in a given year.) The variance of rice prices is higher in sending districts, which lends credence to my hypothesis. The major distinction between the two is levels of wages: wages are higher by Rs. 1.1 in non-sending districts. Given the similarity in food prices, this translates to potentially higher disposable income in non-sending districts and lower impact of variability of food prices.

Table 1

	Mean	SD	N
Sent any indentured immigrants to any colony	.54	(.5)	9452
Number of indentured immigrants per district (conditional)	45.55	(146.55)	5079
Indentured immigrants per year	5434.86	(3369.54)	42
<i>All districts</i>			
Rice price (Rs/maund), all districts	3.96	(1.33)	9330
Volatility, Rice price, Rs/maund	.17	(0.1)	9288
Rice price (Rs/maund), rice districts	3.78	(1.17)	4049
Wheat price (Rs/maund), wheat districts	2.93	(.91)	5279
Wage Rs/month	5.57	(2.44)	9276
<i>Sending districts</i>			
Rice price (Rs/maund), all districts	3.95	(1.41)	5031
Rice price (Rs/maund), rice districts	3.73	(1.16)	2045
Wheat price (Rs/maund), wheat districts	2.99	(.87)	2988
Wage Rs/month	5.07	(2.21)	4985
<i>Non-sending districts</i>			
Rice price (Rs/maund), all districts	3.98	(1.23)	4299
Rice price (Rs/maund), rice districts	3.84	(1.18)	2004
Wheat price (Rs/maund), wheat districts	2.85	(.95)	2291
Wage Rs/month	6.14	(2.56)	4291

I run three main sets of analyses using data from 1873 - 1916. First, I examine indentured migration from Indian districts. Second, I exploit the richness of the microdata to check how volatility changed the composition of the indentured immigrant population. Third, I present results on the long-run impact of initial conditions, including volatility, on return migration to India. The first estimating analysis utilizes equations of the form

$$y_{jt} = \beta_0 + \beta_1 \ln(\text{wage}_{jt}) + \beta_2 \ln(\text{price}_{jt}) + \beta_3 \ln(\text{MinColonywage}_t) + \beta_4 v_{jt} + \Gamma_j + \Gamma_t + \epsilon_{jt} \quad [3]$$

where y takes on either a binary variable for any migrants in a linear probability model, the log of total migrants in a linear model, and the actual count for Poisson models. I alternately include and exclude the time fixed effects. Table 2 combines results for all of these models. In the binary and count models, volatility is positive and significant at the 5 per cent level, and a one standard deviation shift in volatility raises migration more than shifts in colony wages (not shown).

Table 2

	Binary	Continuous	Count (Poisson)
log, Rice price, Rs/maund	-0.0436	0.314**	0.904***
	-0.0425	(0.138)	(0.222)
log, Wage Rs/month	-0.0531	-0.148	0.105
	-0.0335	(0.134)	(0.239)
Volatility, Rice price, Rs/maund	0.141**	0.273	0.892**
	-0.0577	(0.187)	(0.400)
Year FEs	Y	Y	Y
Observations	9179	4956	9051

The second analysis estimates a modified version of equation 3 by restricting the analysis to North India and examining four Hindu castes and Muslims. These are easily recognizable in the data, cover over half of all North Indians and around 20 per cent of the total sample, and cover different socioeconomic positions. Brahmans were high castes theoretically associated

with religious work but mostly found in agriculture and various other occupations. Kshatriya, another high caste, is a category that also includes Jats, Rajputs, and Thakurs. These groups were traditional landowning castes. Ahirs were a traditional middle caste associated with herding work. Although mostly associated with agriculture, Ahirs occupied different jobs than Kshatriyas. Chamars were a low caste that worked with leather and did not own land. Finally, Muslim is a catchall group that encompasses not only persons explicitly denoted as Muslims but also those from caste groups that were largely Muslim. For space, table 3 shows results only for the binary variable.

Table 3

	Brahman	Kshatriya	Ahir	Chamar	Muslim
log, Rice price, Rs/maund	0.0460** (0.0212)	-0.0231 (0.0321)	0.0384* (0.0227)	0.0529** (0.0248)	0.0469 (0.0324)
log, Wage Rs/month	-0.0861*** (0.0236)	0.0117 (0.0327)	-0.0515*** (0.0200)	-0.0648*** (0.0232)	0.00213 (0.0268)
Volatility, Rice price, Rs/maund	0.00897 (0.0444)	0.183** (0.0718)	0.00290 (0.0738)	-0.00160 (0.0577)	0.0532 (0.0641)
Observations	7397	7397	7397	7397	7397

Volatility is positive and significant only for the landowners, Kshatriyas. This is consistent with their forward-looking decisions rather than hand-to-mouth decisions of other groups. Additionally, the other castes migrate less with high wages and more with high prices, which is consistent with hand-to-mouth consumption.

Finally, the third analysis addresses whether volatility exerts a long-run effect on permanent migration. A novel element of Fiji’s data is the tracking of individuals after their arrival due to the contractual offer of a return passage to India after 10 years in the colony, of which at least five were required to be served as an indentured labourer. This meant officials kept extensive records of deaths and actual departures from the colony. The National Library of Australia holds mortality records from the start of indentureship through 1927 and return migration records up through the last repatriations in the 1950s. Therefore, unlike other work on return migration (e.g. Abramitzky et al. 2012), I am able to discover the fate – stayed, died, or returned – of each individual at any given point in time after migration.

I focus on the cohorts who entered Fiji in 1903 or earlier. Workers who entered in 1904 or later were affected by World War I, which reduced the availability of transportation back to India. There are clear differences in the rates of return migration across North Indian castes as well as across sex.

I model return migration parametrically in table 4 using a survival function of time in Fiji with time-invariant and time-varying covariates:

$$\lambda(t | X_{ijt}) = \lambda_0(t) \exp(\beta_1 Female_i + \beta_2 Age_i + \beta_3 Age^2_i + \beta_4 Height_i + \beta_5 Height^2_i + \beta_6 \ln(RicePrice_{jT}) + \beta_7 \ln(wage_{jT}) + \beta_8 v_{jT} + \beta_9 \ln(RicePrice_{jt}) + \beta_{10} \ln(wage_{jt}) + \beta_{11} v_{jt} + \Gamma_k) \quad [4]$$

where i indexes a person, t indexes the current year, T indexes the year of departure for person i , and k indexes a caste. Higher volatility both at the time of initial departure from India and at the time of potentially returning to India significantly reduced return migration.

Table 4

Female	-0.197*** (0.0332)
Ahir	0.0685 (0.0677)
Brahman	0.399*** (0.0799)
Muslim	0.183*** (0.0607)
Kshatriya	0.281*** (0.0621)
log, Fiji monthly wage	1.150*** (0.0799)
log, Wage Rs/month (India)	0.743*** (0.141)
log, Rice price, Rs/maund	-0.790*** (0.104)
Volatility, Rice price, Rs/maund	-2.395*** (0.239)
log, Rice price (depart yr)	-0.302*** (0.107)
log, Fiji monthly wage (depart yr)	0.157*** (0.0524)
log, Wage Rs/month (India, depart yr)	0.318** (0.140)
Volatility, Rice price (depart yr)	-0.540** (0.238)
Observations	147023

The results show that volatility does matter: higher volatility significantly increased migration from a district on both the extensive and intensive margins. Volatility played a role in caste selection. These results are consistent with a lack of consumption smoothing and the use of migration to overcome negative consumption shocks and long-run uncertainty. Differential responses to prices by caste groups indicate different economic roles – notably, the position of Kshatriyas as landlords—but also different access to insurance. Social networks and intra-group insurance may offer support for some groups but not others, and this appears linked to underlying socioeconomic differences across groups. Finally, return migration data show that upper castes returned in higher numbers, although in a dynamic, period-by-period model prices, wages, and volatility matter, too.

Overall, this paper points to the salience of the second moment, measured here as volatility, and provides new evidence on an unexplored topic, South-South migration in the so-called ‘Age of Migration’ prior to World War I. Volatility pushed people out of a low-income location into long-term bonded-labour contracts. For takers, the certainty gains from these contracts outweighed the freedom and mobility costs from servitude. My findings are broadly consistent with the use of indentureship as a risk-mitigation device against volatility.

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Merchant bank trade financing and the British economy, 1870-1913

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International trade credit has received little attention in economic history, and rigorous studies of its role in the pre-WW1 British economy do not currently exist. Based on qualitative evidence, however, economic historians have noted how trade financing played a central role in the prewar money market, and how it was closely linked to fluctuations in Britain's foreign trade. This paper examines the role of trade finance in the pre-WW1 British economy by using a new dataset on merchant bank acceptances, which were typical instruments for financing international trade. It finds that while the importance of acceptances for trade declined after the 1900s, they remained important for the financial system and the domestic economy throughout the prewar years.

Trade credit has attracted a considerable amount of attention in macroeconomics after the recent financial crisis. This research has identified trade finance as an important channel through which the recent financial crisis was transmitted to international trade and national economic conditions (Chor & Manova, 2012). In the context of the Great Depression, Accominotti (2012) shows that acceptance credit played an important role in the transmission of financial shocks between continental Europe and Britain. More broadly, conditions for trade finance usually have macroeconomic consequences by impacting the volume of exports by firms (Amiti & Weinstein, 2011). Furthermore, increases in the availability of trade finance ameliorates the impact of otherwise adverse credit conditions, and may act as a substitute to bank credit (Burkart & Ellingsen, 2004; Huang et al., 2011).

Nineteenth-century international trade was commonly settled using bills of exchange, which were documents acknowledging the debt of one party to another. For example, an English cotton importer would give an American cotton exporter a bill promising to pay in three months upon receiving the goods. In order to be confident that a payment was going to be made, a form of payment insurance was typically required. When a third party guarantees that a bill will be paid, it is said to 'accept' the bills of exchange. This was primarily done by a London merchant bank, which would lend its reputation and accept a contingent liability for a commission. Through having a reputable party guarantee repayment, a bill became more secure and easier to sell (discount) on the money market – the market where short-term debt obligations were traded (Chapman, 1984, pp.6-7). The accepted bill thus became a standardized financial instrument. A seller of goods could receive immediate payment for exports by selling an acceptance onwards.

Acceptances played an important role in the financial system. It was largely through these bills, along with finance bills unconnected to goods trade, that the London discount market functioned as the primary destination for the world's short-term funds (Cassis, 2006, p.100). Both domestic and foreign banks relied on this system for investing in near-cash assets. Therefore, disturbances in the money market could have implications for the rest of the financial system. Contemporary observers considered the volume and liquidity of the acceptance market, together with the Bank of England's willingness to provide additional liquidity by rediscounting these bills, to have been an important factor in British financial stability and status as a financial centre (Eichengreen & Flandreau, 2012; Flandreau & Ugolini, 2011).

Despite the potential importance of trade credit in Britain's economic history, little has been written about this topic, especially using quantitative methods. This chapter contributes a new dataset on acceptances from leading merchant banks, and is the first paper that uses time series econometrics to study the role of acceptances in the prewar economy. The utilization of

recent advances in econometrics together with a large set of quarterly financial and economic data allows us to study how shocks in acceptances, the money markets and other economic indicators impacted each other, and how these relationships changed over time.

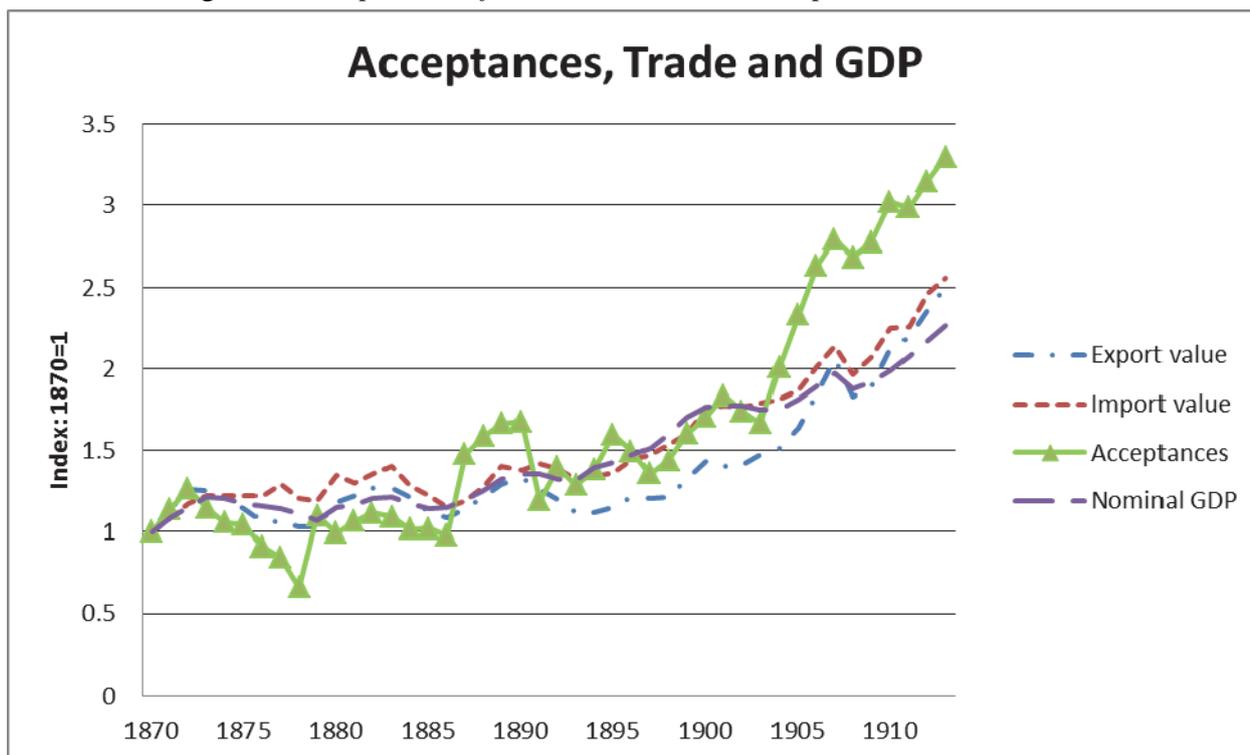
Data

The main contribution of this paper in terms of primary source data is building time series of acceptance credit for the largest merchant banks from 1870 to 1913. This is an extension of the work of Chapman (1984) and business historians of individual banks, who collect yearly data for several merchant banks. While yearly data are useful for examining general business trends in acceptances, higher frequency data are important for formal hypothesis testing. This is because acceptances typically had a three month maturity, and the use of yearly data would make it impossible to study the effects of short-term fluctuations in trade finance. Therefore, I have collected material from available ledgers and related documents which provide bank-specific financial data at a high frequency from 1870 to 1913.

The accounts of most of the important merchant banks have survived, while those of several smaller houses have not. However, the acceptance business was highly concentrated, so the data accounts for a significant share of the outstanding acceptances, and should be representative especially when we look at fluctuations rather than the absolute size of the market. There is no way to accurately estimate the precise representativeness of the sample, because we do not know the amount of acceptances outstanding on bills used for financing trade. If we take a £140 million estimate by Chapman (1984) for the eve of WW1, then the sample includes roughly 40 per cent of the market.

Figure 1 plots the total acceptances held on the balance sheets of the merchant banks in the sample from 1870 to 1913. Acceptances seems to move roughly in line with British trade until the early 1900s, after which the volume of British acceptances grew considerably more rapidly. There are several apparent breaks in the series. The first one is in 1878 amidst the failure of an important Scottish bank, the City of Glasgow Bank. The next large drop was the Baring crisis 1890, where the most important accepting house had to be saved by the Bank of England and a consortium of other banks. The episode was preceded by a substantial growth in the Baring's and several other banks' acceptances. Finally, there was a sharp increase in 1904-06 in the run-up to the American crisis of 1907. This instability in the series motivates the choice for the empirical framework in the next section.

Figure 1: *Acceptances of the merchant banks compared to trade and GDP*



Notes: Banks included in the sample: Rothschild, Schroder, Morgan Grenfell, Kleinwort, Hambro, Gibbs, Brandt and Baring. Please contact author for sources.

Methodology

This paper employs an extension of the vector autoregression (VAR), which has become common in the study of macro-financial linkages.¹⁸⁶ This framework allows us to study the relationships between several, potentially endogenously evolving, time series. However, the standard VAR suffers from two important limitations.

First, it does not allow for structural change in the parameters which govern the relationships between e.g. acceptances and economic conditions. This is important, because my data span several decades, during which it is likely that the relationships between acceptances and the economy changed. The proportion of British trade financed through acceptances declined over time, while London was increasingly financing non-British trade.¹⁸⁷ The link between British trade and acceptances might thus have been stronger at the beginning of the sample. In order to ameliorate this issue, Primiceri (2005) proposes an estimation algorithm for a VAR where the parameters vary over time.

The second issue is that a standard VAR usually incorporates only a limited set of data to avoid the curse of dimensionality, which can bias inference to a considerable extent. In order to get around this issue, Bernanke et al. (2005) proposed augmenting the VAR with factors extracted from a large set of macroeconomic variables. This is useful when dealing with data from the pre-WW1 era, where no quarterly or monthly GDP figures are available for Britain in any case, while the factor approach still allows us to proxy economic conditions at a higher frequency.

Combining the two aforementioned improvements leads to the time-varying parameter factor-augmented VAR (TVP-FAVAR) (Korobilis, 2013). The model is as follows:

¹⁸⁶ See Morley (2015) and references therein.

¹⁸⁷ See Nishimura (1971). Banks developed better international overdraft facilities for their customers towards the end of the 19th century.

$$y_t = \alpha_t + \sum_{i=1}^p B_{t,i} y_{t-i} + \epsilon_t \quad [1]$$

Where y_t is a vector of size N containing the variables of interest at time t, α_t an N-vector of trend coefficients, $B_{t,i}$ is an N x N matrix of coefficients governing the relationships between the variables at time t for lag i, and ϵ_t contains the errors, where we assume that $\epsilon_t \sim N(0, \Omega_t)$. Note that here the coefficients and the variance-covariance matrix Ω_t are allowed to vary over time.¹⁸⁸ What makes this model factor augmented is the structure of y_t :

$$y_t = \begin{bmatrix} f_t \\ z_t \end{bmatrix} \quad [2]$$

y_t contains n factors extracted from several time series, f_t , and time series which are assumed to be perfectly observed, z_t . In our model, z_t contains acceptances and open market rates, and we assume that there are two factors, which are modelled as follows:

$$x_t = \Lambda_t' f_t + u_t \quad [3]$$

The K-vector x_t contains several macroeconomic time-series.¹⁸⁹ The factor loadings in the K x n matrix Λ_t' capture the co-movement between the variables in x_t , whereas the extent to which series move independently is captured by the vector u_t .

Results

The results in this section are from a model estimated using quarterly data from 1880 to 1913, because the available macroeconomic and financial data are much richer after the 1870s.¹⁹⁰ Figure 2 presents impulse responses from a shock to acceptances to British trade. These figures tell us how a 1 per cent shock to acceptances impacts other variables in the model at different horizons (the number of quarters after a shock is on the horizontal axis). The results indicate that positive shocks to acceptances had mildly positive effects on exports until the 1900s and imports until the 1890s. This might suggest that there were constraints on trade financing. Any exogenous decrease in acceptances would thus have impacted trade negatively.

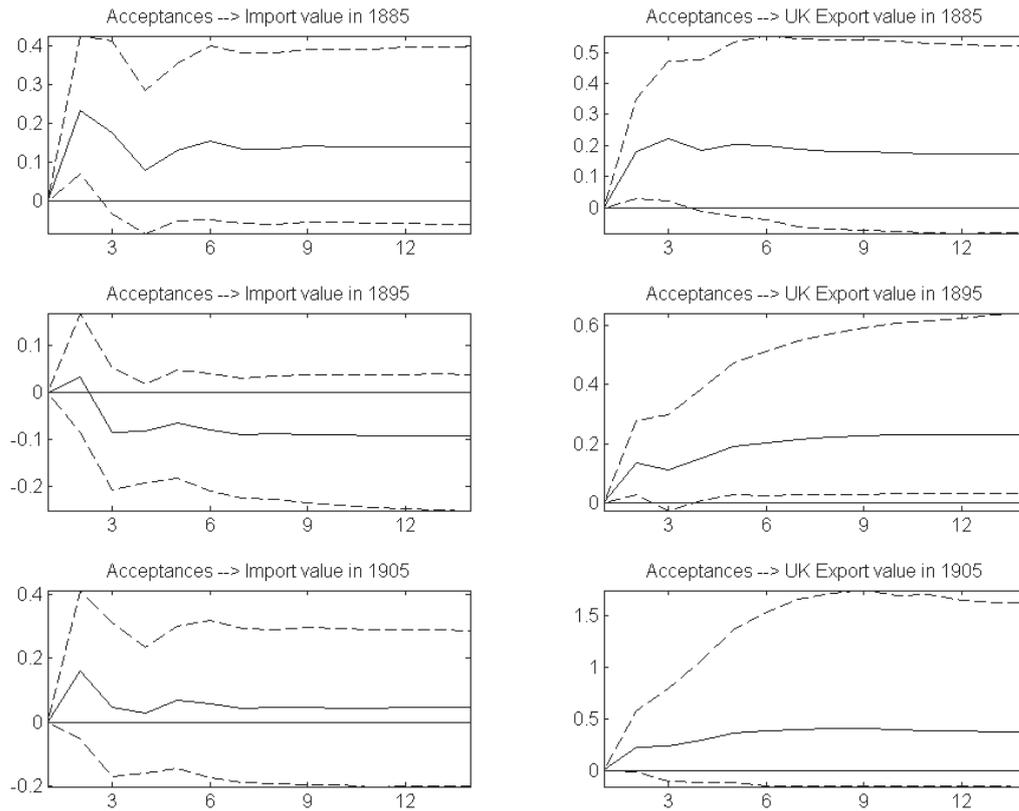
Why do the results for the early 1900s suggest fluctuations in acceptances had an insignificant effect on both imports and exports? There are several potential interpretations, but one possibility is that as London acceptances were increasingly used to finance the trade of foreign countries, we would not expect British exports to be as sensitive to fluctuations in acceptances as in earlier years. It is also possible that the entry of domestic and foreign commercial banks to the business of financing long-distance trade alleviated constraints on trade credit (Nishimura, 1971).

¹⁸⁸ See Korobilis (2013) for details.

¹⁸⁹ 52 used in this paper, contact author for details.

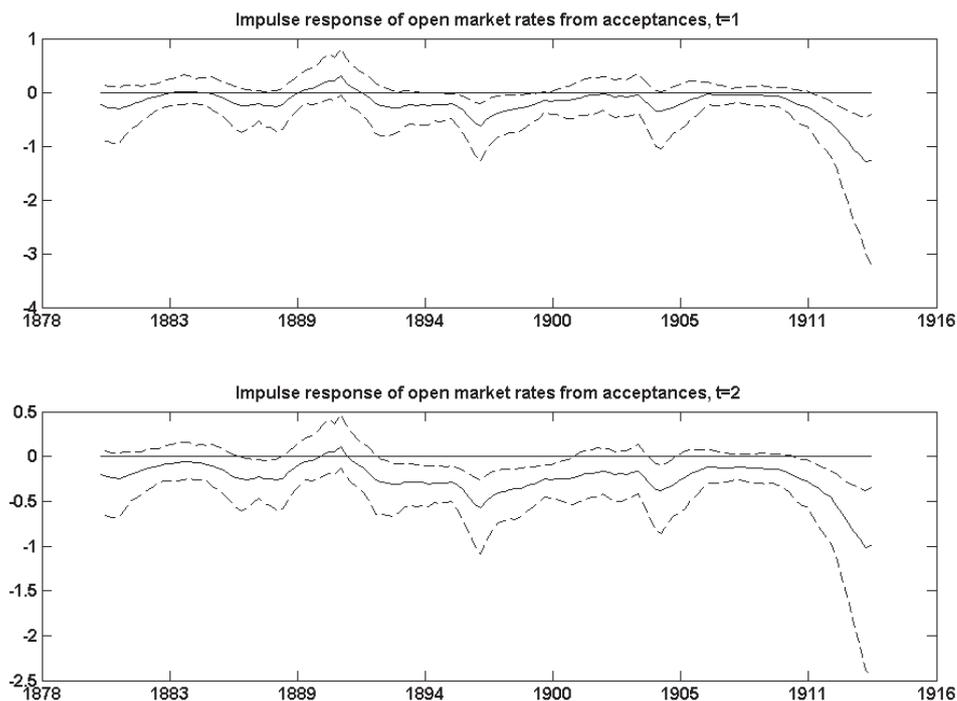
¹⁹⁰ The paper includes a fuller set of results, suggesting that impulses from a smaller set of data from the 1870s are similar to the 1880s.

Figure 2: *Impulse responses of trade volumes from acceptances*



The link between acceptances and the economy extended beyond trade. Figure 3 shows that open market interest rates for bills typically declined after positive shocks to acceptances. The effects are especially significant in the mid-1890s, mid-1900s and in a few years in the 1880s. In contrast, the link between rates and acceptances deviated significantly from this pattern during and immediately after the Baring crisis.

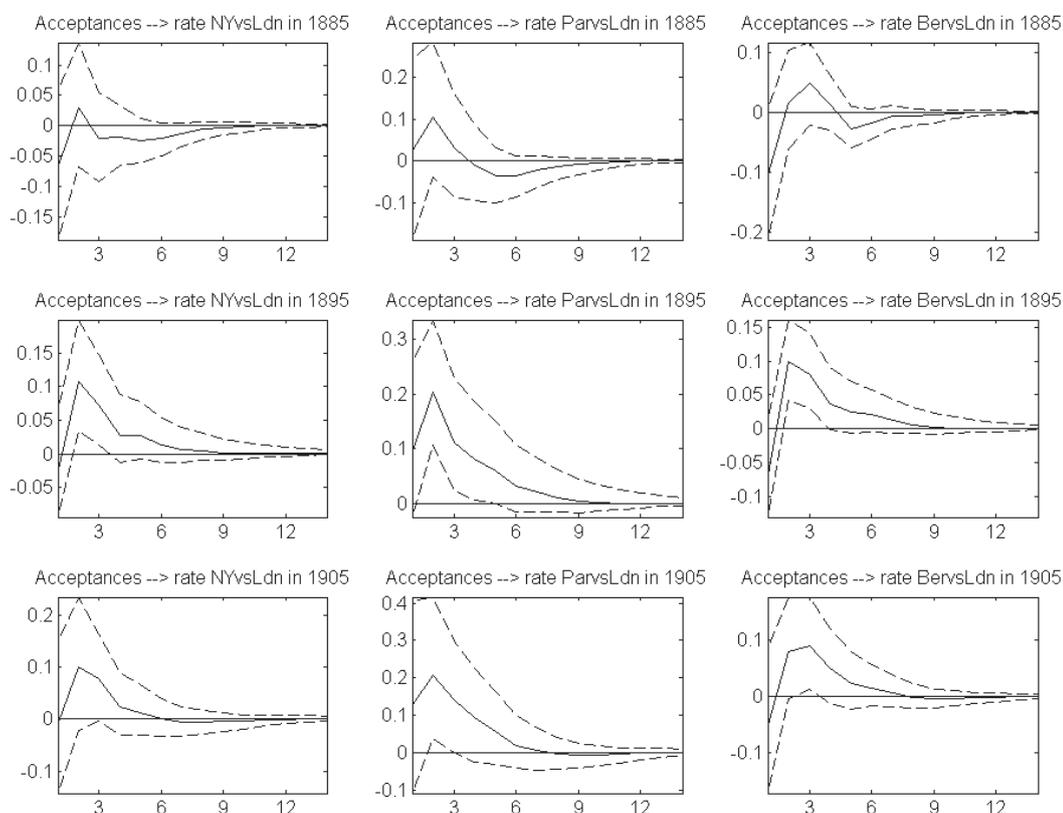
Figure 3: *Impulse response of open market rates from acceptances*



There is thus some evidence to state that an expansion in acceptances led to lower rates on the money market. This effect was also economically significant: a 1 per cent shock in acceptances lowered open market rates by 0.1-0.25 per cent. This would constitute a significant reduction in the cost of short-term loans. However, the mechanism at play might need further consideration. Acceptances were near-cash assets, and macroeconomists have argued that trade credit allows more capital to be employed in an economy, alleviating tightness in financial conditions that firms would face in the absence of it (Guariglia & Mateut, 2006).

Another channel that seems to partially explain this is short-term capital movements. Goodhart (1972) suggests that a high supply of acceptances relative to demand would lead to higher bill holdings of foreign banks, which would be accompanied by short-term capital inflows from the continent. Figure 4 shows that money market spreads between London and other financial centres did indeed widen following shocks to acceptances, especially after the 1890s, potentially suggesting capital inflows.

Figure 4: *Acceptances and interest rate spread between London vs. New York, Paris and Berlin*

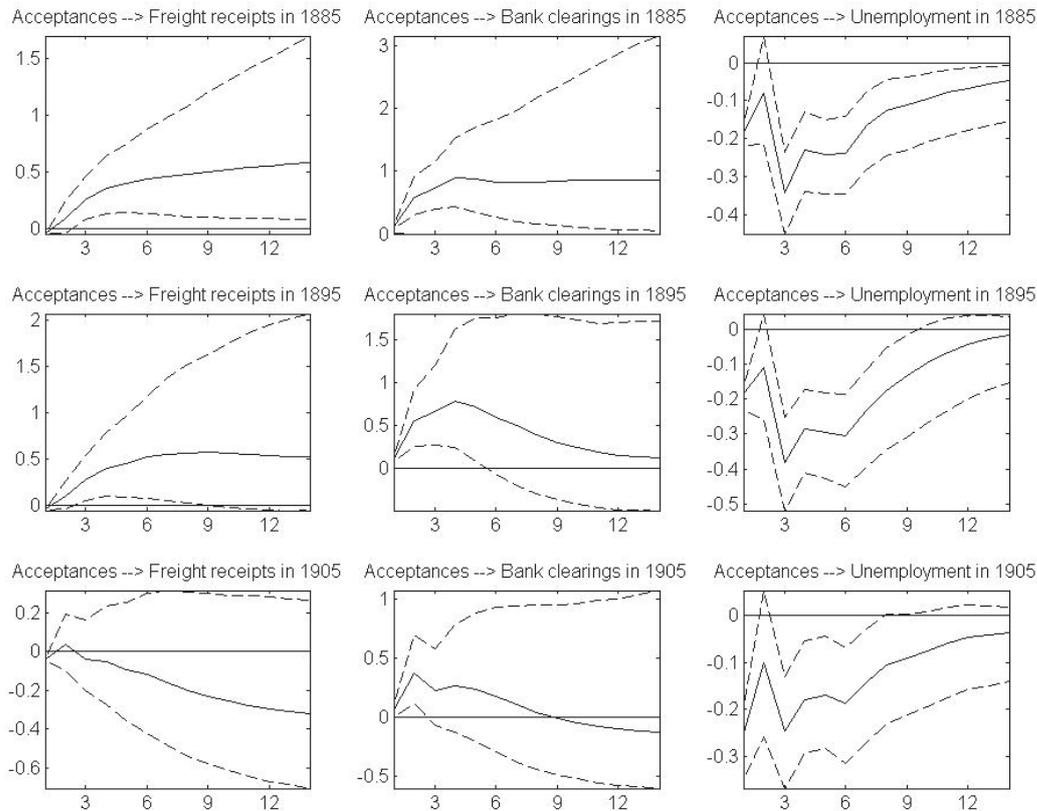


This evidence supports literature which highlights the importance of acceptances to the London money market (Cassis, 2006; Eichengreen & Flandreau, 2012). While the role of acceptances in British trade seemed to be already declining before WW1, these results suggest that their importance to the money market did not.

Given that acceptances had an effect on both money market rates and trade in certain periods, we would expect these to be the primary channels through which fluctuations in bills impacted the rest of the economy. Figure 5 shows the effect of a shock in acceptances to certain real economic variables. (Goodhart, 1972) argues that changes in freight receipts and bank clearings are some of the closest *available* proxies to changes in overall economic conditions at a higher frequency, and my results from the factor model seem to confirm this.

The impulse responses of these variables support the hypothesis that acceptances were of importance for the domestic economy more broadly.¹⁹¹

Figure 5: *Acceptances and real economic conditions*



Conclusion

Based on the econometric results, the main argument of this paper is that shocks in acceptances had macroeconomic consequences beyond their functioning as simple trade credit instruments. While fluctuations in acceptances did have an impact on British exports until the turn of the century, their link with the economy continued to operate through the money market. Increased availability of trade finance may thus have eased credit conditions. It is also possible that acceptances affected market rates due to short-term capital inflows: a higher supply of acceptances relative to domestic demand for them would lead these instruments to flow to the balance sheets of foreign institutions, which would be accompanied by capital flows to the London discount market. These capital flows reduced open market interest rates and thus the borrowing costs in the economy.

The results thus offer some support to historical literature on merchant banking that has stressed the centrality of acceptances in the prewar financial system. Furthermore, the results are consistent with the macroeconomic literature highlighting the importance of trade credit in the economy.

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Capital flows in the periphery: The Italian balance of payments in the Liberal Age, 1861-1914

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Introduction

The wide debate on macroeconomic dynamics in post-Unification Italy underlines the relevance of international capital flows. Many theoretical approaches, from monetarist to Keynesian, explain the role of capital flows studying the balance of payments dynamics. The empirical evidence shows a questionable picture due to a lack of the invisible trade balance. The aim of this paper is to provide a new reconstruction of capital flows in Italy during 1861-1914, referring to an integrated balance of payments scheme, in order to shed light on the issue. If possible, the new dataset will be finally econometrically tested together with other data of the Italian national account.

Different theoretical perspectives

Few processes affected history as globalization since the seventies of the nineteenth century. Reduced transport costs and an increasing communication network allowed mass migration and the increase of trade in a growing global context. Production factors, technology, goods and financial flows circulated among different national economies, involving both poor and rich countries, without relevant trade barriers. From the early eighteenth century until the eve of World War I, there was a massive increase of capital flows from core to peripheral countries, as Italy was after its unification process. Capital flows increased more than in any other century, raising both practical and theoretical implications (O'Rourke, Williamson 2001).

We can distinguish two main theoretical framework for the Italian case: a macro-Keynesian approach and a monetarist perspective. The Keynesian approach developed in Italy during the sixties and the seventies of the twentieth century and it was based on the relevance of the trade balance rather than on investments cycles from abroad. Bonelli (1978) and Cafagna (1989) start from the role of the trade balance of backward countries, as Italy was in the nineteenth century. According to this frame, an increase in the rate of growth driven by investments requires an increase of imports usually followed by a trade balance deficit. The way to maintain the equilibrium of the balance of payments in the long run is to increase exports, as Italy experienced during 1861-80 by exporting raw silk (Bonelli 1978; Cafagna 1989) or, later, other textile goods and light manufacturing sectors (Federico, Wolf 2013). In this context public policies are the main focus of historical analysis, going from a technological catching up approach (Gerschenkron 1968), to a political cycle perspective (Fenoaltea 1969) and to a distributive perspective (Zamagni 2003).

A different framework, based on a monetarist approach, shifts the attention from trade balance to balance of payments stating that the driving forces of growth were the international capital flows and that the current account balance simply adjusted to these. Spinelli (1988) refers to the actual and desired supply of money according to the monetary theory of the balance of payments. When money supply exceeds demand, capital outflows increases and the currency depreciates. According to this framework, the public finance debt financed by currency issue is the first cause of money oversupply. The insight of this theory is that public finance was the main determinant of the high inflation in Italy. Fenoaltea (2011) adopted the same approach to explain the Italian economic growth and its fluctuations. These were due to the supply of foreign capitals in the international market and to the expectations of English investors. In particular, the balance of payments deficit increases both the national financial risk and the interest rates, inducing an increase in the cost of capital and reducing the

investments. This view raised a lot of criticism especially on the side of empirical evidence. Some economic historians attempted to test this explanation using data on foreign capital flows and trying to reconstruct the series of the balance of payments for the period 1861-1914 in Italy (Tattara 1995; Morys 2006; Pistoresi, Rinaldi 2015). Tattara (1995) explains the theory of market equilibrium in the context of the gold standard without any statistical testing. Morys (2006) and Pistoresi-Rinaldi (2015), by contrast, adopt an econometric approach. Morys (2006) applies an econometric model to compare Italy and Austria-Hungary balance of payments. Pistoresi-Rinaldi (2015) refers to Granger causality test to analyse the account deficits at the end of the nineteenth century.

These studies are generally based on the national accounts series provided by Istat in 1957 and the two existing benchmarks of the balance of payments provided by the Bank of Italy for 1891 and 1911 (Biagioli, Picozza 2002; Marolla, Roccas, 2002), according to the frequency of national censuses. These data have two main shortcomings. Firstly, the lack of time series data for the entries of the “invisible trade balance”: rental fee, goods insurance, tourism, emigrants remittance, capital earnings and prepaid expenses; secondly the benchmark approach for the more recent two pillars reconstructed by the Bank of Italy.

Sources and data: a lacking context

The uncertain results provided by the studies described above underline the need for an accurate analysis of the data used by reference literature. The balance of payments estimated by Istat (1957) is a landmark for almost all the analysis of Italian capital flows in post-Unification decades. The account of the invisible trade balance, which is commonly used as a proxy for capital flows (Tattara 1995; Morys 2006; Fenoaltea 2011; Rinaldi, Pistoresi 2015) refers to data on services related to transports, tourism, government spending, labour income and returns on investments. Istat does not provide exhaustive explanations on how each series is constructed. Furthermore, the net balance of the entire period 1861-1914 seems to suggest that Italy was an exporter of capital instead of an importer, making the context even more puzzling.

The other main reconstruction of the Italian balance of payments for the Liberal Age is provided by two studies of the Bank of Italy (Biagioli, Picozza 2002; Marolla, Roccas 2002). Their procedure is based on a benchmark approach and it offers a detailed description of the invisible trade balance in 1891 and 1911, according to the census chronological criterion. The main differences with the statistics provided by Istat are both methodological and historiographical. The first regards the balance scheme used to reconstruct specific values for the benchmarks (figure 1).

Figure 1

Balance of Payments outline, IMF-Manual, IV edition 1977	
Current Account	Capital Account
A. Goods, Services and Income	A. Capital, excluding reserves
Merchandise	Direct Investment
Shipment	In reporting economy
Other Transportation	Portfolio Investment
Travel	Corporate equities
Investment Income	Deposit money banks
Other Goods, Services and Income	Liabilities constituting foreign authorities
B. Unrequited Transfers	Short-term capital
Migrants' transfers	B. Reserves
Workers' remittances	Monetary Gold
Official transfers	Special Drawing Rights
	Reserve Position in the Fund
	Foreign Exchange Assets
	Other Claims
	Use of Fund Credit

Source: Biagioli, Picozza (2002).

The scheme is one of the frameworks adopted by the International Monetary Fund (IMF) which started the publication of the first edition of the “Balance of Payments Manual” in 1948, to continue the integration process of balance of payments standardization carried on previously by the League of Nations until the 1930s. The aim was the integration between national account and balance of payments statistics, a goal reached only with the fifth edition of the Manual in 1993. The IMF integrated the-two schemes towards the adoption of stock data instead of flows data. The relevant-difficulties in defining stock data for post-Unification decades induced the authors to adopt the scheme of the fourth balance of payment manual, edited in 1977, that is the most updated version to look at balance of payment statistics in historical perspective.

The second difference is the wider use of secondary sources, both from Italian and international literature. Estimates looks at studies on the United Kingdom (Feinstein 1967), but also on studies carried out by foreign scholars on Italy such as Tena-Junguito (1989), McGuire (1926) and Baedeker (1913).

The new series

Following the methodology adopted by the Bank of Italy, applying several changes in the criterion for the estimation, I constructed new series for the Italian invisible trade balance from the Unification to World War I. Results of the new estimates are depicted in the following table (figure 2).

Figure 2: *Invisible trade balance, (current million lire)*

Year	Remittances	Tourism	Interests	Freights and insurances
1861	70	72.0	-32	
1862	69.5	74.41	-52	-39.79
1863	69	76.82	-66	-46.53
1864	68.5	79.24	-84	-51.27
1865	68	81.65	-90	-49.40
1866	67.5	84.06	-101	-41.29
1867	67	86.48	-114	-40.12
1868	66.5	81.05	-117	-42.89
1869	66	89.78	-114	-48.66
1870	65.5	98.52	-94	-46.65
1871	74	107.25	-98	-41.70
1872	80	115.99	-85	-54.18
1873	87.2	131.75	-84	-56.37
1874	40	141.77	-80	-72.82
1875	27.2	145.35	-85	-71.17
1876	38.9	148.77	-115	-72.73
1877	64.6	148.46	-122	-64.69
1878	64.4	138.83	-121	-60.55
1879	61.7	133.31	-88	-72.50
1880	65.7	139.89	-146	-69.46
1881	64.6	122.13	-118	-69.72
1882	66.7	268.81	-146	-70.71
1883	64.0	273.84	-133	-69.26
1884	84.5	262.19	-55	-74.70
1885	90.4	121.03	-133	-84.66
1886	95.5	193.34	-152	-90.72
1887	92.2	221.61	-154	-98.83
1888	91.5	231.37	-194	-66.14
1889	95.3	254.58	-194	-88.93
1890	146.6	263.40	-189	-80.54
1891	146.7	209.90	-211	-57.86
1892	137.9	126.00	-219	-61.52
1893	136.6	118.41	-225	-67.22
1894	133.8	114.63	-190	-59.48
1895	141.8	111.54	-131	-63.51
1896	144.5	115.09	-138	-64.57
1897	145.1	114.25	-134	-64.76
1898	148.1	112.66	-131	-78.37
1899	153.8	120.17	-124	-81.20
1900	157.6	119.06	-115	-96.03
1901	161.1	123.27	-107	-96.67
1902	198.3	127.48	-102	-99.21
1903	390.4	134.07	-83	-104.31
1904	488.1	195.06	-73	-106.34
1905	566.3	256.05	-68	-114.56
1906	534.0	317.03	-67	-146.20
1907	711.6	378.02	-61	-171.30
1908	704.4	439.01	-56	-176.36
1909	635.3	490.00	-57	-188.02
1910	694.7	513.00	-60	-194.41
1911	731.4		-70	-201.76
1912	759.3		-73	-220.14
1913	830.8		-98	-214.51
1914	799.6		-95	-168.62

Estimates of the remittances relies on data provided by Corbino (1931) and Carpi (1871) until 1876. Afterwards I used the most recent reconstruction proposed by Gomellini and O Grada (2013) and the methodology adopted by Marolla and Roccas (2002) to compute the two last decades of the series.

The series of tourism is based on the indirect method also adopted for the two benchmarks of the Bank of Italy. It is based on the collection of three different types of information: the number of tourists arriving in Italy by rail and by ship, the daily average expenditure per tourist, and the average period of stay within Italian boundaries.

Estimates on the interests refers only to the Italian yield paid abroad since the lack of data makes it difficult to formulate other assumptions (Zamagni 1998).

Finally, the estimates of freights are based on the adoption of a freight factor defined as the ratio between the shipping cost and the value of the goods transported. Thanks to the recent reconstruction of the Italian foreign trade by Federico, Natoli, Tattara and Vasta (2011) the series estimated provides renewed empirical evidence. Insurances are instead estimated by applying the percentage proposed by Tena-Junguito (1989) over the value of the goods exported and imported.

Conclusion

The reconstruction of the invisible trade balance for the first fifty years after Unification shows a more detailed perspective of the Italian balance of payments dynamics. Thanks to these new data, each theory can be tested with stronger empirical evidence, trying to investigate the role of capital flows within the national growth process experienced between the end of the nineteenth century and the beginning of the twentieth century. I will also show, if possible since it is still a work-in-progress step, the results of an econometrical testing of the new data.

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Economic rehabilitation through trade: The ter Meulen Scheme for international credits, 1919-24

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In the years immediately following World War I, European countries had taken on unprecedented levels of public debt, prewar commercial relationships had been interrupted, inflation was rife, exchange rates were volatile, and many countries' productive means were out of commission. While debt relief and large loans were greatly needed, one of the most pressing issues for governments and private enterprise alike was to rebuild by kick-starting trade promptly. These ambitions could, however, only be fulfilled with the help of trade finance (TF). The minimal credit available was nearly impossible for financially challenged countries – old and new – to procure.

To meet the enormous challenge of financing international trade in the unsettled conditions of the time, a pragmatic, yet fragile, international initiative was proposed at the 1920 Brussels Financial Conference to encourage trade through the provision of TF: the ter Meulen International Credits scheme (TMS). Established under the auspices of the newly created League of Nations, the TMS was designed to utilize a country's physical assets as security for borrowing on international capital markets, thus improving its financial position. However, despite the optimism that it inspired when first announced, the TMS was never operated as planned. That said, the scheme deserves more attention than it has received in the literature since its failure offers important insights into the obstacles to international economic coordination in the aftermath of World War I.

In light of the seemingly insurmountable challenges of postwar reconstruction, an informal meeting of bankers under the leadership of a Dutch banker, Carel Eliza ter Meulen, was convened in the spring of 1919. It resulted in the publication in key daily newspapers of a memorandum that emphasized the need to facilitate imports of essential goods in order to restore countries' productive capacity. Having observed that traditional banking channels would be insufficient due to the scale of the task at hand, the memorandum explained that 'the interests of the whole of Europe and indeed of the whole world [were] at stake'.¹⁹² Their aspiration was to provide TF *despite* the monetary challenges, rather than aiming to solve them directly.

Under the TMS nations would issue bonds that could be used as collateral on private credit supplied through traditional channels to finance imports, thereby ensuring that exporters would receive payment even if the importer were to default. The underlying principle of the scheme was that even apparently impoverished nations possessed assets that had potential value in gold equivalency. An ad hoc sub-committee of the LoN's Provisional Economic and Financial Committee, composed of international bankers and other businessmen, would determine the equivalent value in gold of the underlying assets, as well as the desirability of the proposed transaction, and would intervene should the importer default on payment. It was hoped that endorsement by a properly constituted and impartial committee would bolster the confidence of all parties concerned. The bonds would be secured by government revenue streams (e.g. import/export duties, revenues from state companies, etc.), and the terms of the contract would be negotiated between the exporter and importer as usual. While commercial credit was typically extended for relatively short periods of between 90 and 180 days, the TM bonds would have maturities of between five and ten years. Indeed, short-term credits of this type were sometimes financed directly out of the exporter's working capital or overdraft facilities, but more often an acceptance house discounted the letter of

¹⁹² Memo addressed to the Rt. Hon. David Lloyd George, 15.1.1920, LONA 10 R293 2845/2845.

exchange that bound trading partners. Given the widespread lack of liquid working capital, it was envisaged that banks would supply longer-term credit, either out of their own funds or by issuing debentures. In all cases, TM bonds would constitute ‘very desirable collateral security’.¹⁹³ Finally, one key detail of the scheme was the decision to accord preferred credit status to TM bondholders, so that, in case of default, repayment would take precedence over all other debts – including reparation payments.¹⁹⁴

As Flores & Decorzant (2016) have shown, newly created countries in Central and Eastern Europe were in such financial trouble that they had no hope whatsoever of accessing international capital markets. It was precisely this problem that the TMS was designed to solve: providing bonds that had been vetted by the League and were secured by tangible assets, according preferred credit status to investors, and, as it would emerge, the overseeing of economic reforms. Despite the fact that the scheme had the dual benefit of supplying borrowers with access to capital for the financing of imports, and furnishing a novel way of securing this investment opportunity to lenders, why was the TMS never brought to fruition?

To explain the failure, Myers (1945) concentrates on the demand side, invoking countries’ resistance to the idea of economic tutelage and their fear of being branded as impoverished.¹⁹⁵ Nevertheless, countries including Bulgaria, Latvia, Lithuania, Hungary, and Austria expressed interest in the scheme. Initially, the TMS had made no explicit mention of the necessity for countries to submit to any specific oversight of economic and fiscal policy, as the TMS committee’s prerogative was limited to assessing the gold value of pledged assets, and to supervising the appropriation of them in case of default.¹⁹⁶ Indeed, the commission was presented as a group of benefactors whose *raison d’être* was to find a tailor-made solution for the borrowing country.

The TMS’s creators, however, had underlined the fact that countries would only be ‘deserving of credit’ if they brought ‘expenditure within the compass of [...] receipts from taxation’;¹⁹⁷ potential borrowers would therefore have been aware that they would not receive a blind endorsement from the TMS sub-committee. It was only later that it became clear that the scheme would be used to force austerity upon participating countries. After a late 1921 trip to the US to promote the scheme and ascertain the level of interest of American decision-makers, scheme organizer Drummond Fraser mentioned how Herbert Hoover, then Minister of Commerce, had reiterated how private capital would never extend even short-term TF before budgets had been balanced, currencies stabilized, and controls on exports and imports, designed to improve balance of payments positions, had been removed.¹⁹⁸ Drummond Fraser later affirmed that the security provided by the scheme depended on ‘the introduction of those fundamental internal fiscal reforms which are so necessary to the re-establishment of healthy economic life in all the new European States’.¹⁹⁹ Furthermore, following Bulgaria’s request to begin TMS negotiations, TMS managing director Leneveu drily reminded the Bulgarian finance minister that ‘the TMS was only intended for countries willing to re-establish budgetary equilibrium and reduce fiduciary circulation’.²⁰⁰ Either the intentions of the international credits sub-committee had not been made explicit in the original plan, or, under pressure from creditors (notably the US), the scheme had evolved into a tool to leverage benefiting countries into adopting economic reforms that respected the principles of economic orthodoxy. Potential beneficiaries’ fear was not of tutelage in case of default as the TMS clearly intended but rather it was due to the policy demands made of them before the TM

¹⁹³ LoN, International Credits

¹⁹⁴ Memo addressed to the Rt. Hon. David Lloyd George, 15.1.1920, LONA 10 R293 2845/2845.

¹⁹⁵ It is unclear whether Myers was referring to tutelage before entering TMS or in case of default.

¹⁹⁶ LoN, op.cit.

¹⁹⁷ Appendix to *Note on Financial Conference at Amsterdam*, 13-15.10.1919, KINGS/PP/JMK/FI/5.

¹⁹⁸ *The Herald*, NYC, 9.12.1921, LONA 10 R320 10902/18568.

¹⁹⁹ Report to Finance Committee of the EFC, 10.2.1922, LONA 10 R352 12790/19135.

²⁰⁰ [My translation]. Leneveu to Tourlakoff, 25.05.1922, LONA 10 R352 12790/21181.

bonds were even issued. The fact that six countries accepted such surveillance a few years later in the context of the LoN's stabilization loans makes it difficult to imagine that this fear was the principle reason for the TMS's failure.

Other historians have pointed to the supply side of credits. Eichengreen (1992), for example, suggests that the TMS failed because the fear that indebted countries would repudiate their existing loans undermined US support for the scheme. Although this was a substantial concern, I maintain that this view over-simplifies the problem. To understand why the US did not support the TMS and failed to engage more actively with the international community, its domestic economic and monetary policies and the consequent political tensions must be considered.

In reality, the US faced a conundrum. On one hand, its enormous exposure to European wartime debt signified the necessity of buying goods from debtor countries in order to facilitate their acquisition of the dollars essential for the amortization of their loans. On the other hand, US exporters, whose economic importance had increased considerably during the war, wanted to continue their expansion into foreign markets and therefore needed access to domestic sources of TF. It is important to remember that the US had little experience in managing such tensions; its postwar status as the world's premier international creditor was unfamiliar and represented a major transformation from its prewar role as the world's largest international debtor.

The architects of the recently-created Federal Reserve System had made concerted efforts to increase domestic financial stability by encouraging the development of a discount market based on the financing of trade, since it was perceived as less volatile than the call market which had long been the mainstay of the US money market (O'Sullivan, 2016, ch. 6). In the early 1920s, the US monetary authorities, notably the Federal Reserve Bank of New York, made concerted efforts to increase the importance of New York as a centre for financing international trade by encouraging the development of such a market to rival London's (Eichengreen & Flandreau, 2010; O'Sullivan, 2016). Furthermore, as early as 1919, even more aggressive efforts were made to promote US exports through domestic TF reforms with the passage of an amendment to the Federal Reserve Act, known as the Edge Act. This legislation 'authorize[d] the formation of banking corporations [...] to do foreign banking, finance exports and carry on such other financial operations as may be necessary to promote the export of goods from the United States. Corporations of this type [were] permitted to invest in foreign securities and to offer their own obligations, secured by their foreign collateral, to American investors' (Notz & Harvey, 1921, 321). Edge corporations were a perfect match for the TMS, given that they could 'hold the TM bonds as security and issue debentures against their value' (Abrahams, 1967, 162).

Needless to say, US demand for TM bonds was critical if the scheme was to work. This was made evident by a whirlwind tour of the US undertaken by Drummond Fraser in the fall of 1921. The visit would give him the opportunity to explain and promote the scheme, and also gauge US support for it. In Drummond Fraser's own words, if financial and commercial interest in the scheme could be stimulated, his efforts 'should not be rendered fruitless by political opposition, based on hostility to the League of Nations'.²⁰¹ The TMS director's optimism was further made clear by his belief that 'the availability of the bonds [would] also doubtless help to make a reality of the Edge Corporation idea, and the activity of these corporations [would] provide funds not only for financing commercial credits, but also reconstruction loans', thereby anticipating the possibility of the scheme serving as a conduit for longer-term capital.²⁰²

Initially Drummond Fraser's optimism seemed to be buoyed by proposals put forward by the American Bankers Association to establish a massive foreign TF corporation, called

²⁰¹ *Visit to the USA: Summary of Results*, January 1922, LONA 10 R320 10902/18568.

²⁰² *Ibid.*

the Foreign Trade Financing Corporation, with a share capital of a whopping \$100 million. Subscriptions to its capital were never fully filled however, and the corporation was abandoned. An important reason for its failure was the refusal by Chicago banks to support it (Abrahams 1967) but other contributing factors included: the belief that the corporation was too big, disagreement as to who would benefit from it and a 'sentiment against extending credit to foreign people' (Owens, 1922, 361-2).

The Fed was aware of the issue of capital shortage since it had planned for the War Finance Corporation, an institution created to support the war effort, to subscribe to debentures of Edge Act investment trusts. The prospects for US support of the TMS dimmed still further when the Fed tightened credit conditions in May 1920. It justified its action in light of the inflationary pressures that continued to prevail in the US in the years after the war, but agricultural interests cried out in protest. When the Fed refused to lower discount rates even after the onset of the deflationary depression of 1920-1, it became the object of even harsher criticism (Wicker, 1966). As a result, the prospect of supplying substantial new commercial credits to European countries became a highly sensitive issue in the US. On a policy level, there was a widespread sentiment of 'America First', visible in attitudes to both international finance and trade policy (e.g. aforementioned tariffs of 1921/2). However worries about a domestic capital shortage were played down by J.P. Morgan's Thomas Lamont, who criticized claims that foreign lending made domestic lending more onerous and assured delegates at the Genoa Conference in 1922 that private US banks had some \$3.5 billion ready to lend.²⁰³ While internationally-oriented Wall Street banks supported the TMS, countervailing interests elsewhere in the country became more vociferous. Ironically, notwithstanding its enthusiasm for the expansion of the United States' role in international trade finance, the Fed may have inadvertently contributed to the failure of the TMS through its aggressive management of monetary policy during the postwar depression.

In conclusion, the TMS, which initially inspired considerable optimism despite the risks of such a targeted scheme co-existing with massive postwar financial instability, ultimately failed because it contained intrinsic components that affected demand for, and supply of, TM bonds, and also because of the prevailing internal dynamics in the US. On the demand side, notwithstanding their initial interest, potential beneficiaries were dissuaded when it emerged that exacting structural adjustment claims would be imposed *before* TM bonds could be issued. Although the precondition of *ex ante* relinquishment of economic sovereignty must have seemed like a high price to pay, it is possible that structural reforms required under the TMS would have aligned with certain domestic decision-makers' goals, but this possibility has yet to be confirmed. On the supply side, while traders and financiers were set on improving US TF facilities, the inexperience of the country's economic policymakers, efforts to undertake structural changes to the financial system, and national tension regarding credit conditions, all made critical support of the TMS unobtainable.

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²⁰³ Lamont, "Foreign Trade Fallacies", *The Manchester Guardian Commercial*, 15.06.1922, KINGS/PP/JMK/GS/1/6.

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The effect of industrialization on fertility and human capital: Evidence from the United States in the nineteenth century

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Introduction

During the second industrial revolution, in the late nineteenth century, fertility rates sharply declined in Western countries while human capital levels increased. In this paper, I provide county-level evidence for a causal effect of industrialization on fertility and human capital, and also an analysis of heterogeneity in the effect.

Industrialization could have an effect on the level of human capital by increasing the demand for skilled workers who can read manuals, implement blueprints, and install and repair machines. Fertility may decline because parents who choose to invest more time and money in the human capital of their children, face a budget constraint and cannot raise as many children as before (a discussion of those and other possible mechanisms can be found in Galor 2012).

The historical trends of lower fertility and mortality rates during the second phase of the industrial revolution are grouped under the term 'The Demographic Transition', and are viewed as a pivotal element in the transition from a long period of economic stagnation to the modern period of constant economic growth (Galor and Weil 1999). Studying the relationship between industrialization, fertility and human capital in the nineteenth century may help us to understand one of the most dramatic changes in human history, and also provide us with a better understanding of the effects of industrialization today in developing countries. However, studying the relationships between industrialization, fertility and human capital is not easy. Empirical studies have not yet uncovered the relative importance of different mechanisms and theories proposed for the Demographic Transition. It is also not clear whether the industrial revolution caused lower fertility rates and higher investment in human capital, was caused by them, or were there other important missing factors that changed during the nineteenth century and affected all three variables. Analysing simple correlations does not help us to understand the causal mechanisms which operate behind the scenes.

In order to deal with those problems, studies such as Franck and Galor (2015a), Franck and Galor (2015b), and Pleijt, Nuvolari, and Weisdorf (2016) offered an instrumental variable approach. Using an instrument for Industrialization, those studies have estimated the effect of industrialization on fertility and human capital during the nineteenth century in France and in England. However, those studies suffer from two important limitations: the use of cross-section analysis with an instrument which is fixed in time, and a limited dataset in regards to variables and number of observations. The first limitation is especially important. Using cross-section data, one cannot control for unobserved variables at the county level, and the results are only based on the variation between counties. In this paper I propose a dynamic instrument, which allows me to use county fixed effects and to base the results on the variation within counties, controlling for many potential unobserved variables that may affect the relationship between industrialization, fertility and human capital. Another important contribution of this paper is a heterogeneity analysis of the effect of industrialization according to various attributes. Analysing heterogeneity in the effect may enable us to further understand the mechanisms behind the Demographic Transition and the industrial revolution.

Scope and data

The data are taken from the decennial censuses, the Agricultural Census and the Manufacturing Census carried out by the US Bureau of the Census Library throughout the nineteenth century. The sample period is 1850-1900. Most of the results are limited to 1,490 counties east of the 95° line of longitude whose boundaries remained unchanged during the period.

The main measure used for industrialization is the share of the adult male population employed in manufacturing. However, because ‘Industrialization’ is not a well-defined concept, I also consider two other measures of industrialization: total capital invested in manufacturing per capita and total value of manufacturing output per capita. Fertility is measured by the number of children above age five per adult (i.e. survival fertility, as measured by Fernández, 2014). Apart from limitations in the data, the reason for using survival fertility rather than total fertility or number of births is the high rates of mortality among infants under the age of five, which changed significantly during 1850-1900 and may have affected fertility decisions (Haines, 1998). Adult male literacy rate is used as a measure for the level of human capital in a county, a statistic that is available for most of the counties for the years 1850, 1870, 1880, and 1900.

The following figures present the geographical distribution of the three main variables. Looking at the figures, one can easily observe the negative correlation between industrialization and fertility, and positive correlation between industrialization and human capital.

Figure 1: *Share of manufacturing male workers, average 1850-1900*

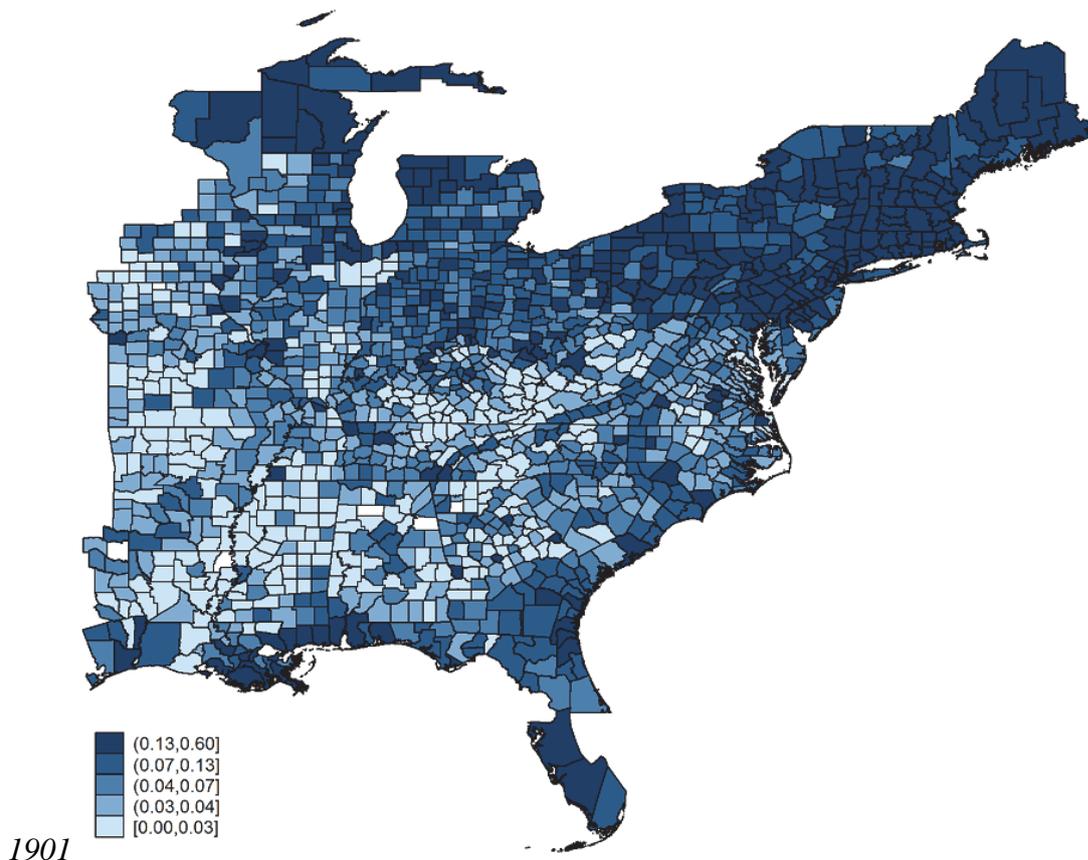


Figure 2: *Fertility, average 1850-1900*

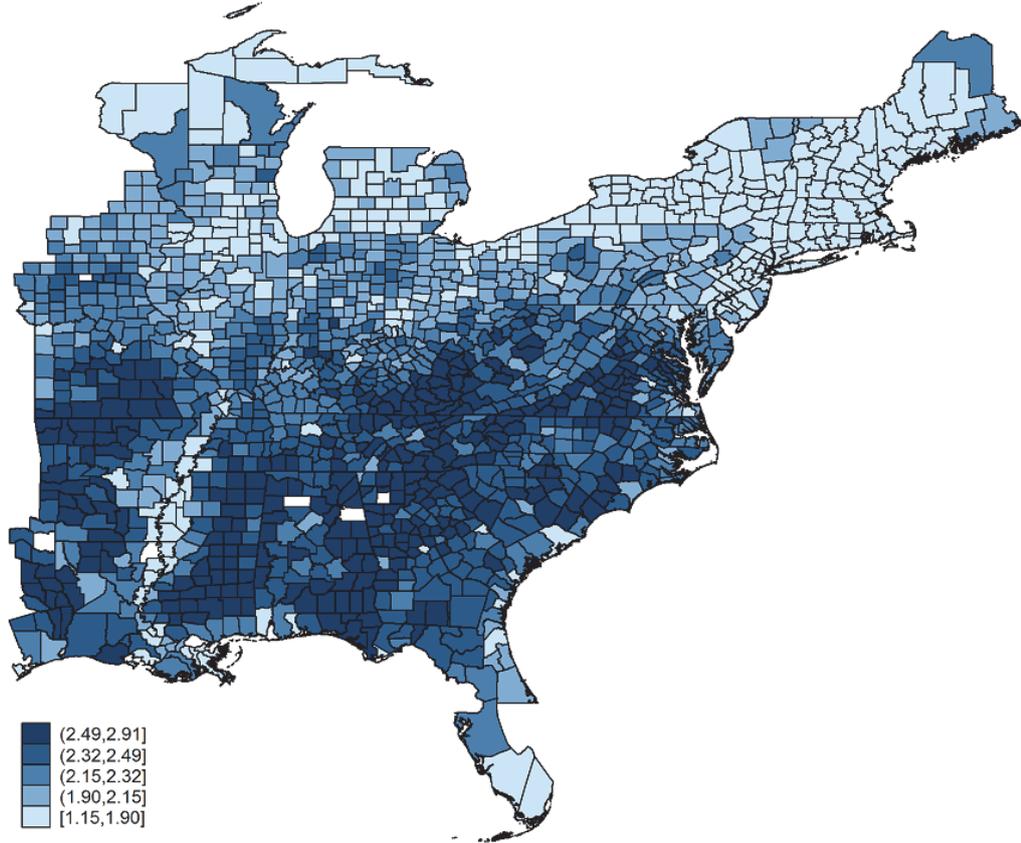
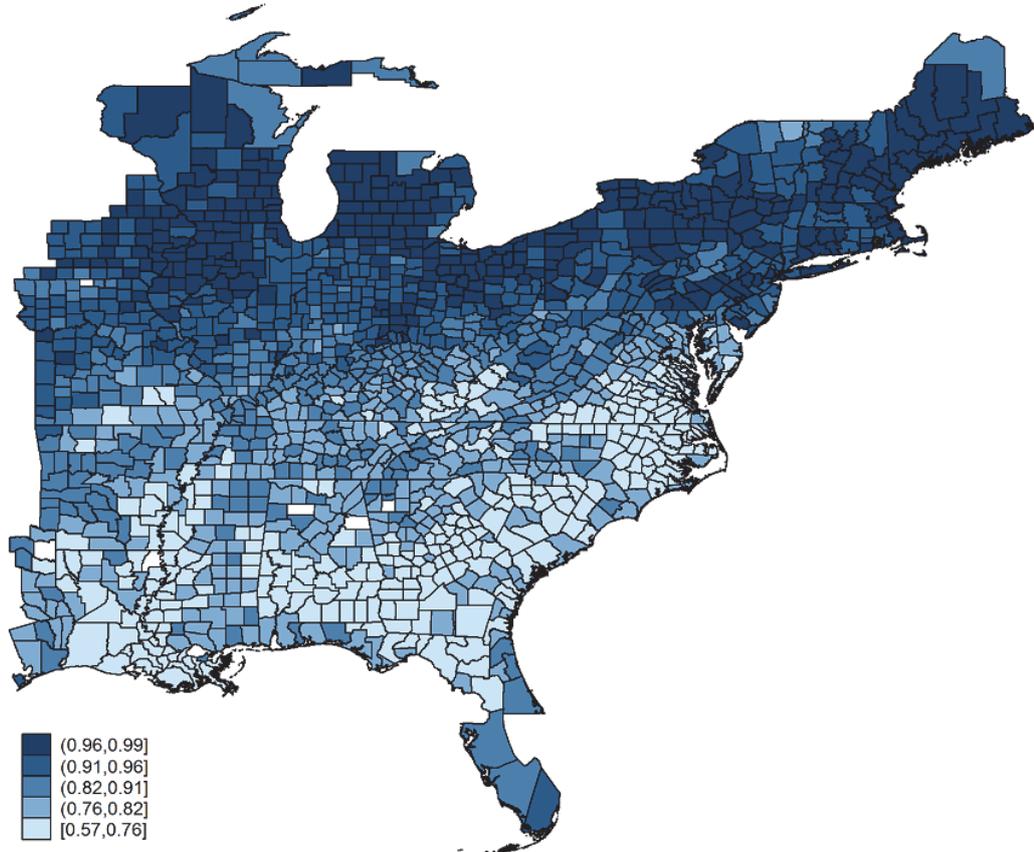


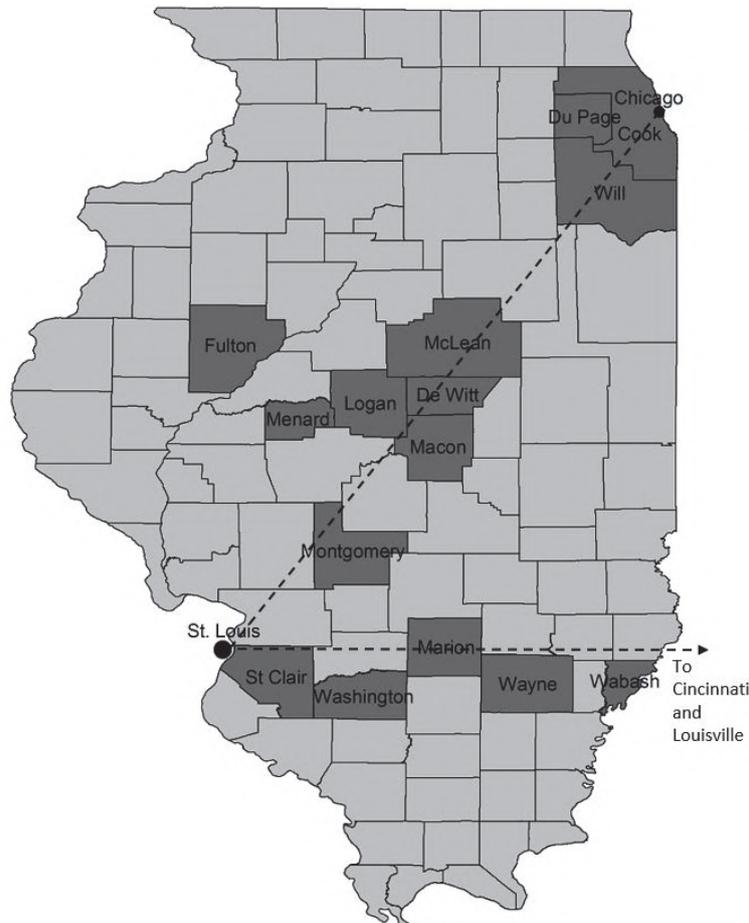
Figure 3: *Adult male literacy, average 1850-1900*



Empirical strategy

I use aerial distance from potential transportation routes between major cities as an instrument for industrialization. The example of the Illinois counties is shown in the following figure.

Figure 4: *Example for the identification strategy - Illinois Counties*



The population of Chicago grew from about 30,000 in 1850 to about 1.7 million in 1900 and during that period new transportation infrastructures were developed, connecting it to other major cities, such as St. Louis and Cincinnati. The industrialization process itself may be endogenous, and so may be the actual location of transportation infrastructure between major cities. However, some counties, such as McLean, Logan, and Montgomery, which were located on a straight line connecting Chicago and St. Louis, had a higher probability of gaining access to railways, roads or canals simply because of their location. The transportation infrastructures increased potential profits from industrialization in those counties. Thus, a possible instrument for industrialization is the distance of a county from the nearest straight line connecting between two of the largest cities in each period. I control for year and county fixed effects and for the distance to the nearest large city, since the location of the cities may be endogenous.

Most of the following analysis is based on the 10 most populated cities in each period east of the 95° line of longitude. An issue that arises involves cities that dropped out of the top-10 list at some point: assuming that those cities remained relatively large, the railroads or canals leading to those cities did not disappear, nor did their effect on industrialization in the counties between them. Therefore, I use the minimum distance for all previous periods, rather than just the current period. This effectively means that cities can only enter the list of ‘large cities’, they do not leave the list. I also omit from the list cities that became neighbourhoods of other cities during the period.

Instrument validation

First-Stage Power

The following table presents the results of the first-stage regressions. The regression equation is as follows:

$$\text{Log}(IND_{i,t}) = \beta_0 + \beta_1 \text{Log}(LINEDIST_{i,t}) + \beta_2 \text{Log}(CITYDIST_{i,t}) + \delta_i + \gamma_t + \epsilon_{i,t}, \quad [1]$$

where $IND_{i,t}$ is the share of adult males employed in manufacturing in county i during period t , $LINEDIST_{i,t}$ is the minimum distance between county i and the nearest connecting line between two of the 10 largest cities in any period $j \leq t$, $CITYDIST_{i,t}$ is the distance to the nearest large city, δ_i are county fixed effects and γ_t are year fixed effects.

Table 1: *First stage - the effect of distances on industrialization*

	(1)	(2)	(3)	(4)
Dependent Variable:	All	All	All	Observations
Manufacturing Workers	observations	observations	observations	with literacy data
Minimum Distance to Nearest Connecting Line	-0.102*** (0.0120)	-0.0333*** (0.0123)	-0.0922*** (0.0210)	-0.128*** (0.0217)
Minimum Distance to Nearest Large City		-0.624*** (0.0335)	0.112*** (0.0312)	0.179*** (0.0354)
F test			14.89	24.18
County Fixed Effects	no	no	yes	yes
Year Fixed Effects	no	no	yes	yes
Observations	8,569	8,569	8,566	5,724

Standard errors are clustered at the county level

*** p<0.01, ** p<0.05, * p<0.1

All variables are in logarithm except the dummies

F test robust to clustering, according to Olea, J. L. M., & Pflueger, C. (2013)

The first stage results are presented for all observations (columns 1-3) and for observations for which we have literacy. As can be seen from the table, the distance has a significant negative effect on industrialization, given the controls. The F-statistic is larger than 10, a common rule of thumb in the empirical literature for a strong first stage. Further analysis suggests that there was a large correlation between the distance to the nearest connecting line and the distance to the nearest railroad, and that counties near the connecting lines were not different than counties far from the connecting lines before the relevant cities became important, so there were no different pre-treatment trends.

The causal effect of industrialization on fertility and human capital

The following table presents OLS and IV results for the main specification. The econometric model is as follows:

$$\text{Log}(Y_{i,t}) = \beta_0 + \beta_1 \text{Log}(IND_{i,t}) + \beta_2 \text{Log}(CITYDIST_{i,t}) + \delta_i + \gamma_t + \epsilon_{i,t}, \quad [2]$$

where $Y_{i,t}$ is fertility or literacy in county i at time t , $IND_{i,t}$ is the share of male workers employed in manufacturing, $CITYDIST_{i,t}$ is the distance to the nearest large city, δ_i are county fixed effects and γ_t are year fixed effects. $IND_{i,t}$ is instrumented by the minimum distance to the nearest connecting line between two of the 10 largest cities in each period.

Table 2: Main results

Dependent Variable	(1) OLS Fertility	(2) IV Fertility	(3) OLS Literacy	(4) IV Literacy
Manufacturing Workers	-0.0227*** (0.00258)	-0.315*** (0.0693)	-0.00210 (0.00464)	0.252*** (0.0487)
Minimum Distance to Nearest Large City	0.0591*** (0.00567)	0.0823*** (0.0126)	-0.0204*** (0.00622)	-0.0527*** (0.0127)
Observations	8,566	8,564	5,724	5,721
First Stage F test		14.89		24.18
County Fixed Effects	yes	yes	yes	yes
Year Fixed Effects	yes	yes	yes	yes

Standard errors are clustered at the county level

*** p<0.01, ** p<0.05, * p<0.1

All variables are in logarithm except the dummies

F test robust to clustering, according to Olea, J. L. M., & Pflueger, C. (2013)

Column two shows that industrialization has a significant negative effect on fertility: an increase of 10 per cent in the share of male workers employed in manufacturing reduces fertility by about 3.1 per cent. Column four shows that industrialization has a significant positive effect on adult literacy rates: an increase of 10 per cent in the share of workers employed in manufacturing increases literacy by about 2.5 per cent. In both models, the OLS coefficient is biased towards zero relative to the IV coefficient. This may be due to measurement errors in the proxy for industrialization or a missing variable that operates in the opposite direction.

The results are robust to alternative industrialization measures, such as the real value of capital invested in manufacturing per capita and the real value of manufacturing output per capita. The results are similar when varying the number of large cities included in the empirical analysis, although the power of the first stage is weaker when using more than 12 cities, because the transportation routes between smaller cities were less relevant for industrialization. The analysis is also robust to not including counties near large cities, including western counties and the city of San Francisco. Including only counties with literacy rates below 95 per cent increases the effect on literacy, and replacing current fertility with future fertility increases the effect of industrialization on fertility, as expected if the effect is due to a real change in the behaviour of individuals.

Heterogeneity in the effect of industrialization

In order to analyse heterogeneity in the effect, I use the following equation:

$$\text{Log}(Y_{i,t}) = \beta_0 + \beta_1 \text{Log}(IND_{i,t}) + \beta_2 \text{GROUP}_i * \text{Log}(IND_{i,t}) + \delta_i + \gamma_t + \epsilon_{i,t} \quad [3]$$

where GROUP_i is a binary variable indicating whether a county belongs to a particular group of counties that may differ in the effect of industrialization on fertility and human capital. As before, the interaction term $\text{GROUP}_i * \text{Log}(IND_{i,t})$ is instrumented by the interaction between GROUP_i and the log distances. The significance and sign of the estimator of β_2 can tell us if the effect of industrialization in a group of counties was statistically different than in all other countries.

The model was tested using a variety of characteristics which can theoretically affect the relationship between industrialization, fertility and human capital. No significant differences in the effect were found for counties with large or low shares of females in the

manufacturing labour force, for counties which had a large share of slaves before the Civil War, or for counties in geographical areas such as the Northeast, the Midwest and the South.

However, the results do indicate that the effect of industrialization was smaller in counties with a large share of foreign immigrants, so foreign immigration probably does not drive the effect. I also find that the effect was significantly larger in counties that were relatively more industrialized in 1850 and significantly smaller in the less industrialized counties, that the effect on fertility was smaller in the low-fertility counties, and that the effect on literacy was smaller in the high-literacy counties and larger in the low-literacy counties.

The findings for initial industrialization levels indicate the existence of a positive feedback loop: in more developed counties industrialization had a larger effect on fertility and human capital, which in turn may have encouraged further industrialization, leading to a divergence between them and less developed counties. A possible reason for this divergence is the type of industries established in the different regions. Further analysis suggests that counties that were more industrialized in 1850 developed more capital-intensive industries with a higher output value, a higher share of female workers and a higher share of literate workers.

Concluding remarks

This study establishes a causal effect for industrialization on fertility and human capital in the United States during the period 1850-1900. According to results for the main specification, an increase of 10 per cent in the share of workers employed in manufacturing reduces fertility by about 3.1 per cent and increases literacy by about 2.5 per cent, and alternative specifications or measures for industrialization produce results of a similar magnitude. An analysis of heterogeneity in the effect finds that the effect was larger for counties that were relatively more industrialized in 1850.

This study adds to the literature by using a novel identification strategy, based on panel data and an instrument for industrialization, to examine the case of the United States during the second half of the nineteenth century and by analysing the heterogeneity of the effect of industrialization according to various attributes.

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Coping with income shocks by doing more of the same

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The neoclassical model of labour supply predicts hours worked increase as wages increase, but do conditions exist where this relationship reverses? The current paper examines if rural farming households in the US Cotton South during the early twentieth century used farming wage work off the family farm to cope with declines in household incomes. A negative correlation between household incomes and farm wage work suggests a violation of the neoclassical model of labour supply due to the Cotton South's lack of crop diversity. The same negative shock to household incomes also reduces demand and wages for farming wage workers. A correlation between house incomes and wage work raises the question of the relationship between household production and human capital investment. Previous research (Lombardi 2016) shows a negative correlation between school enrolment and farming incomes. In response to declining incomes, do households choose to reduce schooling, increase wage work, or both?

To examine the relationship between incomes and wage work, I use cotton yields as a proxy for farming incomes in the Cotton South. Initially, I use Ordinary Least Squares (OLS) to regress farm wage work on cotton yields and controls. To address the potential endogeneity of incomes, I use Two Stage Least Squares (2SLS) and predict cotton yields with weather variables in the first stage. Household data come from the US Decennial Census. Crop data come from the US Agricultural Census. I use NOAA's nClimdiv dataset for temperature and precipitation measures to predict cotton yields. I use a Bivariate Probit model to examine the choice between wage work and schooling investment in response to declining incomes.

I completed the estimates for the relationship between incomes and wage work (e.g. OLS and 2SLS). In general, I find no correlation between farm wage work and incomes. However, I find a negative statistically significant relationship when the sample is restricted to credit constrained households (e.g. black and tenant farming households). A complete write up can be found on econpaul.lombardi.com or can be requested by email. I am currently estimating the relationship between household production and human capital investment. Preliminary results suggest households increase wage work or decrease schooling, not both, in response to declining household incomes.

Historical individualism: mass migration and cultural change

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This paper studies the cultural determinants and implications of the mass migration waves that took place between Europe and the New World during the nineteenth and early twentieth centuries. The cultural dimension of focus is individualism-collectivism and a link to migration is proposed to exist due to a process of selection. It is hypothesized that individualistic types are more prone migrate and that this self-selection generates a push towards collectivism in the sending population simply through a change in composition of cultural types.

Combining different sources of data allows me to study all emigrants and stayers in Sweden and Norway during the period 1860-1900. I provide quantitative evidence in support of the hypothesized link between migration and individualism – this across counties and provinces as well as at the more individual level. In the process, I provide a new method of measuring individualism-collectivism over time by looking at the dispersion and concentration of children's given names.

To my knowledge this is the first paper to study the evolution of a core cultural trait, using actual historical data.²⁰⁴ Doing so seems important in light of the accumulating evidence that culture on one hand impacts contemporary economic issues and on the other is shaped by history (see Nunn 2012 and Alesina & Giuliano 2015 for review).

Furthermore, I study an important event, the Age of Mass Migration, and draw attention to a cultural aspect that has been neglected so far. It has already been documented that migrants were negatively selected in terms of wealth (see Abramitzky et al. 2016 for review). But if selection also took place along cultural lines, important implications may follow. First, this helps explain why New World countries such as the United States today are among the most individualistic in the world. Second, individualism and collectivism have been linked to innovation and coordination and are likely to have played an important role in economic development.

Individualism and migration

The individualism-collectivism cleavage is one of the most widely studied cultural dimensions in economics and other fields. While individualism is associated with an emphasis on the independent self and inner attributes, collectivistic societies emphasize the interdependent self that derives its identity from the social environment.

Based on these characteristics, it appears obvious that this cultural trait may be relevant in relation to migration. The act of migration involves leaving your current place of residence and the associated social environment. An individual with strong ties to the surroundings will be less likely to undergo this act as he will suffer a higher cost. Collectivists are thus less likely to leave the group and migrate, while the opposite is true for individualists.

Such a mechanism has been discussed before in the social psychology literature and supported with evidence that recently settled countries and regions are more individualistic than others (Kitayama et al. 2006). Contrary to the belief that harsh frontier conditions foster an independent spirit, it is argued that these places become individualistic due to an initial self-selection of migrants. They call this the 'voluntary settlement hypothesis'. A natural implication, which this literature does not discuss, is that the sending population necessarily

²⁰⁴ Other papers look at assimilation (Fouka 2015) and antisemitism using historical data (Voigtländer & Voth, 2012).

becomes more collectivistic simply because the concentration of collectivistic people increases when individualistic types leave.

Brief historical context

Between 1850 and 1913 the New World absorbed more than 40 million Europeans. Immigration was facilitated by a near absence of regulatory policies and cheap transportation costs. It was motivated by the search for economic opportunities and freedom.

I focus on Sweden and Norway, which had some of the highest emigration rates in Europe during the late nineteenth century. Scandinavian emigration peaked in the 1880s, reaching 1.1 per cent of the population per year in Norway and 0.8 per cent in Sweden. An estimated total of 25 per cent of the population emigrated during the entire period of mass migration (Hatton & Williamson, 1992).

Data and measurement

The main data source for this project is the North Atlantic Population Project (NAPP), which is a collection of historical census microdata. I make use of the full-count census from Norway for the years 1865, 1900 and 1910, and from Sweden in 1880, 1890, and 1900. The data contains information on the entire Swedish and Norwegian populations at several points in time during the period of mass emigration.

A characteristic of the NAPP data, which makes it ideal for the empirical analysis of this paper, is that information is recorded at the individual as well as the household level. I am thereby able to trace how individual choices are impacted by one's family background. Besides economic and social circumstances, this includes the inter-generational transmission of cultural values as it is captured by the given names.

Besides the measurement of culture, a key task is to identify the individuals that emigrated from Norway and Sweden during this time period. I have obtained digitized emigration passenger lists from the Swedish and Norwegian national archives.²⁰⁵ By law, all emigrants were recorded by the shipping companies with personal details. In addition to this, aggregate emigration numbers are obtained from the Swedish and Norwegian historical national accounts.

The dispersion of given names as an indicator of individualism

As highlighted, a contribution of this paper is to offer new methods of measuring individualism back in time. This is necessary for the study of cultural persistence and change in more detail. Specifically, I use the concentration of children's names at a given point in time as an indicator of collectivism, and dispersion as individualism. This is founded in the extensive literature that already exists on names and the ability of a name to encode both individual and group identity.

At the individual level a common given name appears linked to the desire to conform and fit in rather than differentiate and stand out from the mainstream. Studies on families in the United States show that parents who eventually choose less common names for their children are motivated by a desire for the children to be unique and different (Zweigenhaft, 1981, Emery, 2013). Bearers of uncommon names have furthermore been found to score low on values associated with conformity (Schonberg & Murphy 1974).

At the aggregate level a general wish in society to stand out will result in a broader dispersion of names and vice versa. This has been noted across regions in the US and Japan (Varnum & Kitayama, 2010), and falling trends in name commonness have been documented for a number of Western countries (Liebersohn & Lynn 2003, Twenge et al. 2010).

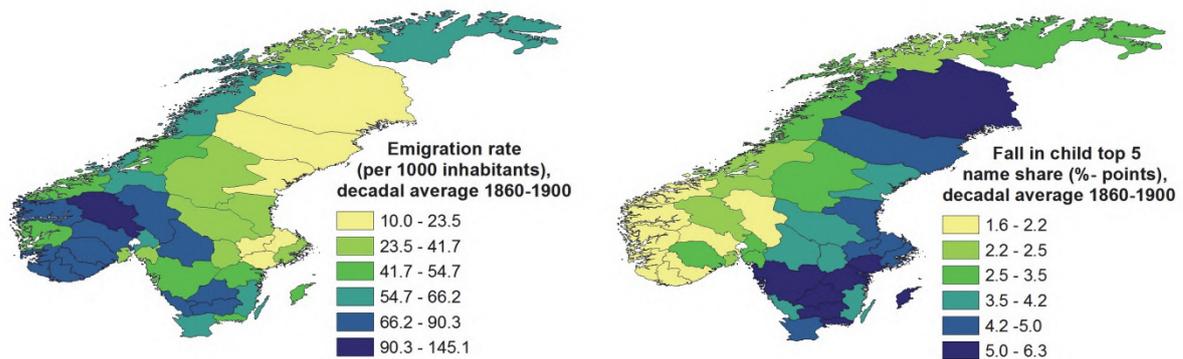
Commonness of a given name is here measured as the share of individuals in a specific cohort within a specific subnational unit that share this name. This is easily done

²⁰⁵ These include the Swedish Emihamn database and the Norwegian Emigrant database (for which I am grateful to Anette Clausen for sending).

using the NAPP data. At the aggregate level, overall name commonness is calculated as the share of an age cohort that receives a top five boys or girls name within a given region.

To give a sense of the spatial distribution of the key variables described in this section, the average decadal emigration rate as well as the change in child name commonness is illustrated in figure 1. The left map shows that the intensity of emigration varied a lot across regions, and the right map shows that all regions saw a fall in child name commonness over time, implying rising individualism. Comparing the two maps, however, shows that the rise in individualism seems dampened in regions that experienced a lot of emigration. While this will be formally tested below, it lends some support of the hypothesized link between migration and cultural change.

Figure 1: *Emigration and cultural change across Sweden and Norway, 1860-1900*



Empirical evidence: migration and cultural change

To test whether mass emigration is associated with a push towards collectivism (or a smaller move towards rising individualism) and thus a weakening of cultural persistence, a regression model of the following form is estimated:

$$col_{rt} = \beta_1 col_{rt-1} + \beta_2 emi_{rt} + \beta_3 col_{rt-1} * emi_{rt} + \beta_X X_{rt} + \varepsilon_{it} \quad [1]$$

The subscript r refers to a Norwegian province or a Swedish county and t refers to a decade within the time period 1860-1900. Collectivism (col) is measured as the share of individuals born during the decade that receives a top five most popular girl's or boy's name within the region²⁰⁶. Emigration (emi) refers to the share of the regional population that emigrated during the decade. Accordingly, the collectivism in a given region and decade is regressed on its level of the past decade, the rate of emigration that has taken place as well as the interaction between the two.

The results are shown in table 1. Explanatory variables are continuously added, and in column 4 population controls are added, which include population level and growth as well as their interaction with the level of collectivism of the past decade. Decade and region fixed effects are added as well.

It is evident from all columns that the cultural indicator persists, as past levels significantly predict present levels. This persistence is however significantly weakened if emigration takes place as the coefficient estimate on the interaction term in the last two columns is negative and significant. Adding the coefficients on emigration and the interaction term, we see that regions with a below-median initial level of individualism (a lower names concentration) become more collectivistic when emigration takes place.

²⁰⁶ Some cohorts are recorded in more censuses. The 1890-99 Swedish cohort is, for example, present in the 1880 and 1890 census. When this is the case, I use the census closest to the cohort's birth years.

Table 1: *Emigration and cultural persistence, Sweden and Norway 1860-1910*

	(1)	(2)	(3)	(4)
	Children with top 5 name share			
Children with top 5 name share (lagged)	0.683*** (0.065)	0.698*** (0.064)	0.655*** (0.053)	0.587*** (0.167)
Emigration share		0.189*** (0.051)	0.914*** (0.102)	1.022*** (0.152)
Emigration * lagged children top 5 name			-2.509*** (0.339)	-3.117*** (0.554)
Population controls				Y
Observations	221	221	221	221
R-squared	0.98	0.98	0.99	0.99

Region and decade fixed effects are included in all regressions. Population controls are described in the main text.

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Mechanism: self-selection of migrants

Now, I will test the hypothesis that individualistic types self-select in to migration. If the case, then this mechanism may be an important part of the explanation behind the documented link between emigration and cultural change.

From the emigration records, I have information on the full name, birth year and last place of residence of almost everybody that emigrated from Sweden and Norway during the age period 1860-1930. Ideally, I would link this to the NAPP census data at the individual level. But that is a difficult process and one that I am still working on.

For now, I conduct the analysis at the given names level. To test whether more individualistic types select in to migration, I estimate the following regression model:

$$emi_{nrc} = \beta_1 commonnes_{nrc} + \beta_X X_{nrc} + \varepsilon_{it} \quad [2]$$

The dependent variable, *emi*, is the share of people recorded in a NAPP census with a particular given name (*n*), of a particular five-years age cohort (*c*), and with residence in a particular region (*r*) that eventually end up emigrating. The emigrant share is regressed on the commonness of the given name.

Controls are calculated from the census as average characteristics of the people that share this given name. The baseline controls include average surname commonness, the average number of servants in the household (to proxy wealth), the share of internal migrants, urban residents, and farm owners. For children under the age of 15, controls are extended to include the average number of siblings, the share that receive the same name as a parent, and a host of parent characteristics such as age, internal migrant share, and foreigner share.

Table 2 reports the results. Controls are added continuously. To avoid the impact of spelling mistakes, the sample is restricted to given names that are associated with at least one emigrant. In the last four columns the sample is further restricted to people that were below the age of 15 in a given census, so that I can control for relevant childhood and parental characteristics. In columns 3 and 7, the dependent variable is the number of emigrants that moved after the age of 15 by which age I consider them adults and in control of their own emigration decision. Finally, fixed effects are included for census year, region, age cohort and gender, and standard errors are clustered at the region level.

In all regressions, more common (and thus collectistic) given names is associated with a significantly smaller share of emigrants. Interestingly I find that more wealthy given names send less migrants, which is in line with the other research. The findings hold when restricting

to those that were below the age of 15 in the censuses and when only considering emigrants that migrated above the age of 15.

Table 2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total emigration share		Adult emigration	Total emigration share			Adult emigration
Name commonness	-3.012*** (0.169)	-2.716*** (0.168)	-2.070*** (0.092)	-3.084*** (0.311)	-2.835*** (0.304)	-2.778*** (0.296)	-1.685*** (0.152)
log (number of servants)		-0.067*** (0.010)	-0.040*** (0.007)		-0.066*** (0.018)	-0.075*** (0.019)	-0.036*** (0.010)
Sample		All			Children (<15 years)		
Additional controls		Y	Y		Y	Y	Y
Child controls						Y	Y
Observations	173,134	173,134	173,134	63,706	63,706	63,706	63,706
R-squared	0.07	0.08	0.09	0.11	0.13	0.13	0.16

Fixed effects are included for census year, county/province, age cohort and gender

Additional controls and child controls are described in the main text.

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Conclusions and future research

This paper documents a link between mass migration and cultural change. Focusing on Sweden and Norway in the second half of the nineteenth century, I show that individualistic types are more prone to migrate as they feel less attached to their surrounding social environment. In the sending population, this self-selection generates a push towards collectivism.

Besides organizing information from emigration passenger lists, an important part of the paper has been to use the concentration of given names as an indicator of collectivism versus individualism. The underlying intuition being that common names reflect the desire of the parents for the child to fit in rather than stand out.

In the future, I plan to expand the analysis to cover more countries and in more detail. First of all, I am working on linking the emigration passenger lists to the NAPP census at the individual level. Second, I plan to trace the migrants to the United States to see where they move, how they integrate, and what impact they might have had on the economy and institutions. Finally, I am constructing alternative indicators of individualism based on the use of personal pronouns in historical texts such as local newspapers.

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Collectivization of Soviet agriculture and the 1932-33 famine

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The Holodomor famine in Ukraine deserves a place among the worst disasters in human history. In 1933, the peak year of the famine, in some areas officially registered mortality figures reached as high as 240 per thousand. Studying the Great Chinese Famine (1959-61) Meng, Qian and Yared (2015) argue that lack of precise information about the harvest led to over-procurement of grain from more productive areas and as a result to higher mortality in more productive areas. I complement this theory by showing that the collectivization of agriculture that started several years earlier significantly increased famine mortality. I argue that lack of incentives to work on collective farms led to a substantial drop in grain production and to increased mortality. The two channels (drop in production due to collectivization and over-procurement due to unobservability of the harvest) are comparable in magnitude, although the effects offset each other (higher collectivization decreases production but increases observability). I use district level mortality figures collected in the Russian State Archive of the Economy and data from published sources to construct a unique extremely detailed dataset describing districts in Ukraine before the famine, and conduct analysis of the effects of collectivization on 1933 mortality relying on cross-sectional variation in collectivization rates. Despite an extensive narrative history of the Holodomor, to my knowledge, this paper is the first to provide quantitative estimates of the effects of collectivization on Soviet rural sector.

‘Gizza job’: De-industrialization and ‘urban decline’ in Liverpool, c.1960-85

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In 1982, the BBC broadcast the landmark drama series *Boys from the Blackstuff* following a group of erstwhile tarmac layers as they faced repeated challenges brought on by the early 1980’s recession. The pleas of Yosser Hughes, to ‘gizza job’, seemed to capture a level of desperation experienced by many in the de-industrializing city, ultimately reflected in Hughes’ eventual mental health problems.²⁰⁷ His phrase ‘gizza job’ has entered the social lexicon of de-industrializing Liverpool, emphasizing the city’s continued unemployment problems.²⁰⁸ Through Hughes’ treatment of his wife, and the women around him, we are able to question the effects of ‘de-industrialization’ on 1980’s masculinity; economic change was an inherently gendered process, with male unemployment rising sharply as more women entered the workplace.²⁰⁹ The series, set in Liverpool, became something of a cultural icon, and was in many ways emblematic of that city’s ‘decline’. Of course, this singular cultural representation of complex processes can only tell us so much about how ‘de-industrialization’, understood as the decline in manufacturing employment, affected social, economic, and physical change in twentieth-century Britain. These processes of change were expressed and understood by politicians and civil servants through statistical evidence, with ‘decline’ seen in both absolute and relative terms. But this statistical evidence was also interpreted by these same actors, who sought to understand how different processes of change interacted, and better know their effects on particular urban areas. This process of ‘urban decline’, to which de-industrialization was a central process, was a crucial concern for a range of state and non-state actors throughout the second half of the twentieth century. As such, this paper will argue that if we take ‘space’ into consideration – that is, if we focus on particular urban areas – then it is possible to see how de-industrialization and decline were not necessarily mutually-exclusive ‘metanarratives’.²¹⁰ Rather, the former reinforced or hastened the latter. What is more, through a focus on the social and spatial effects of de-industrialization, we can see how it was understood *as* decline.

Unemployment in Liverpool

The city of Liverpool has received much critical treatment by historians, and as such its unemployment problems in the twentieth century are well-known.²¹¹ As we can see in figure 1.1, the rate of unemployment in Liverpool was consistently well above the average for Great Britain, often exceeding twice the national average. Though the rate of unemployment had been in double figures since 1976, the most marked increase, unsurprisingly, occurred during

²⁰⁷ *Boys from the Blackstuff* [television series], written by Alan Bleasdale (BBC, first broadcast 10 Oct. - 7 Nov. 1982).

²⁰⁸ For example, the trope was deployed in Derek Worlock & David Sheppard, *Better together: Christian partnership in a hurt city* (London, 1989), pp.141-64.

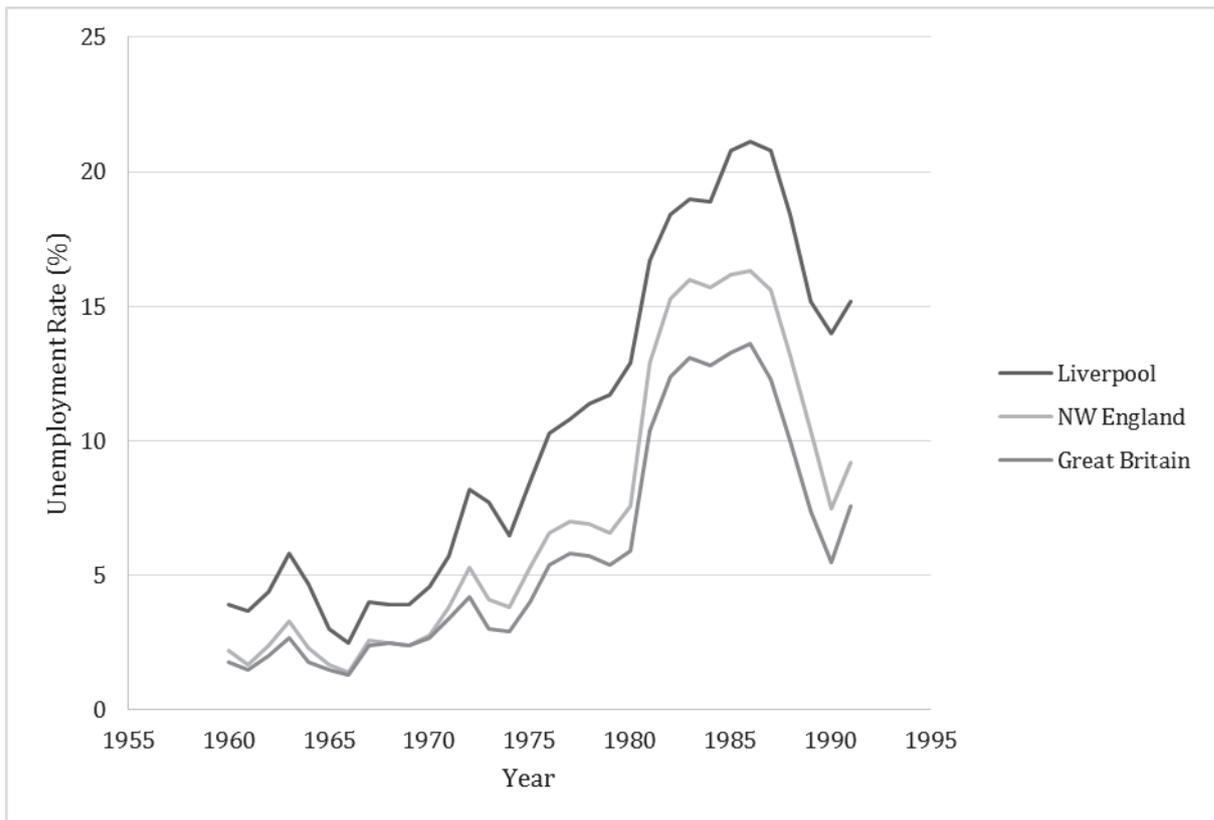
²⁰⁹ See Jim Tomlinson, ‘De-industrialization not decline: a new meta-narrative for post-war British history’, *Twentieth Century British History* 27 (2016), pp.91-2, and Sara Connolly and Mary Gregory, ‘Women and work since 1970’ in Nicholas Crafts, Ian Gazeley and Andrew Newell, *Work and pay in 20th century Britain* (Oxford, 2007), pp.142-78.

²¹⁰ Tomlinson, ‘De-industrialization not decline’, pp.76-99.

²¹¹ Recent works include Jörg Arnold, “‘Managed decline’?: zur diskussion um die zukunft Liverpools im ersten Kabinett Thatcher (1979-1981)”, *Informationen zur modernen Stadtgeschichte* (2015), pp.139-54; Brian Marren, *We shall not be moved: how Liverpool’s working class fought redundancies, closures and cuts in the age of Thatcher* (Manchester, 2016), pp.31-51; and Charlotte Wildman, *Urban redevelopment and modernity in Liverpool and Manchester, 1918-1939* (London, 2016).

the early 1980s. In May 1980, the rate stood at 12.9 per cent and reached 18.4 per cent by May 1982 – a nearly 50 per cent increase in unemployment. In order to pre-empt some questions about my methodology here, I will say that I chose to use the data for May in each year to align annual data with that of the decennial censuses. Rates of unemployment, of course, were in constant flux and these statistics represented economic snapshots. And so, in many ways, it is more important to speak about long-term trends and rates of parity/disparity than individual figures.

Figure 1.1: *Rates of unemployment in Liverpool, North West England, and Great Britain, 1960-91*



Sources: *Ministry of Labour Gazette* vols. 68-75 (1960-67); *Employment and Productivity Gazette* vols. 76-77 (1968-69); *Department of Employment Gazette* vols. 78-93 (1970-85); *Employment Gazette* vols. 94-99 (1986-91).

As we can see from the graph, there was a definite gradation to the different scales at which unemployment was measured – the urban, the regional, and the national. The rates of unemployment generally followed the same trends, with rates rising and falling concurrently. Nevertheless, despite these fluctuations, the rate of unemployment in Liverpool was always far in excess of national and regional rates. This level of disparity is important in our understanding of how social and economic change occurred in the city during the second half of the twentieth century, and in how this consistently high level of unemployment affected everyday life within Liverpool as I will outline below. But this disparity was also significant in the development of contemporary regional and industrial policy. With Liverpool's unemployment problems, from the 1960s, consistently above the national average, the city and its environs were designated as 'development areas' providing government assistance to industry, including through Industrial Development Certificates (IDCs) and the Regional Employment Premium (REP). This led to a number of manufacturing plants being established in Merseyside, providing employment for suburban and exurban communities. Nevertheless, much of this industry declined during the late 1970s and early 1980s. Economic assessments, compiled by the North West Regional Council of the Confederation of British Industry (CBI),

provide an insight into this decline. The CBI had, throughout the 1970s, sought to highlight the positive aspects of regional economic performance in the face of overwhelmingly negative press coverage, especially where industrial relations were concerned.²¹² In spite of this role, the CBI's internal reports show growing concern. As one assessment for April to May 1982 read: "Optimism" is not a word I would use too readily in connection with business views in the North West. It is more a case of hoping against hope'.²¹³ The assessment went on to declare that: 'Any upturn will have to be clearly signalled before the troops will be prepared to come out of their trenches'.²¹⁴ Later in the year, the assessment was that: 'For many the situation is deteriorating and a mood of quiet desperation is developing'.²¹⁵ Finally, the report for September-October 1982 simply read 'Curiously stoical. No fireworks. Just hanging on'.²¹⁶ Clearly, these assessments point to a deteriorating economic situation in the North West of England, the region which covered the city of Liverpool, even if there is some wryness in the language deployed. Economic trends themselves were important. But as I will explain, this series of statistics and assessments had real import for 'ordinary' people. They underwrote social changes which occurred in Liverpool, and were integral to the developing conception of the 'inner city' in 1970s and 1980s Britain.

De-industrialization and the 'inner city'

Liverpool was not an 'industrial city' in the same way as, for example, Manchester, Leeds, or Sheffield, but rather relied on services – especially shipping – as the lifeblood of its economy. As figure 1.2 shows, the membership of Liverpool's Chamber of Commerce halved over a 43-year period, highlighting the closure of many locally-active businesses. While the proportion of the Chamber members from the manufacturing sector increased throughout the 1960s and 1970s, it would be a misnomer to say that Liverpool was not subject to a process of de-industrialization. This was especially evident in Vauxhall, an area of Liverpool located to the north of the city centre.

Figure 1.2: *Membership of the Liverpool Chamber of Commerce, 1950-93*

Year	Total Members	Manufacturing Sector (%)	Services Sector (%)	Retail Sector (%)	Other Sector (%)
1950	2277	25	70	4	1
1960	1989	30	61	8	1
1970	1915	36	56	2	6
1980	1919	32	62	6	0
1993	1046	10	85	5	0

Source: UKDS: SN 6878, Chambers of Commerce Historical Census and Benchmarking Data 1790-2005.

Between 1969 and 1975, Vauxhall was home to a Community Development Project. This project, one of a number set up by the Labour government in the late 1960s, summarized many of the economic problems which the area faced:

As Liverpool has declined as a port, related industries have less and less reason to concentrate in Vauxhall. And they themselves in many cases have faced the need to "rationalise" or shift production to new plants. Vauxhall with its industrial dereliction

²¹² LRO: M352 MIN/2/13/10, Appendix 29, the image of Merseyside as seen from London, 18 October 1978, pp.1-5; and MRC: CBI MSS 200/C/4/1978/5, Innovators in the North West and Cheshire, March 1978.

²¹³ MRC: CBI MSS 200/C/3/REG/10/4, CBI NWRC Monthly Report, April-May 1982.

²¹⁴ Ibid.

²¹⁵ MRC: CBI MSS 200/C/3/REG/10/4, CBI NWRC Monthly Report, May-June 1982.

²¹⁶ MRC: CBI MSS 200/C/3/REG/10/4, CBI NWRC Monthly Report, September-October 1982.

*and restricted sites has little to offer. Between 1967 and 1972 some 20% of the jobs in [the] Vauxhall industrial strip disappeared, and the decline has steepened since then.*²¹⁷

Similar trends were evidenced across Liverpool's inner area, with multiple project reports produced during the 1970s highlighting the implications of this on the social and built environment of the city.²¹⁸ But these problems were not just a concern for the state. Derek Worlock and David Sheppard, respectively the Roman Catholic Archbishop and Anglican Bishop of Liverpool, were important actors in the city's urban governance during the late 1970s and 1980s. In their jointly-authored tome, *Better Together*, they described their interactions with families and communities affected by de-industrialization:

*When, in response to pressing invitations, we visited the threatened factories, more to show sympathy and to raise morale than in any realistic hope of changing decisions already taken, we would meet brothers, sisters, brothers- and sisters-in-law, mothers, sons and daughters – five from one family in one afternoon visit. Nearly a quarter of Tate and Lyle's production workers walked to work from the Vauxhall area, where even before that closure unemployment was already 46 per cent.*²¹⁹

Clearly, the process of de-industrialization, in this case the closure of a sugar refinery, could have dramatic consequences for individual families and household incomes. There were other examples of this, with the closure or downsizing of United Biscuits, Dunlop, and British American Tobacco having a similar effect on the communities from which they drew their workers.²²⁰ But industrial closure also contributed to the spread of dereliction in Liverpool, a major contributor to the city's urban blight.

Vauxhall in the 1970s was described as having 'probably reached its lowest point – at least visually, as unemployment rose steadily'.²²¹ Vacant land was already a persistent problem, amounting to some 500 hectares (or 5 km²) in the mid-1970s.²²² In fact, over one tenth of Liverpool's inner city comprised vacant or derelict land.²²³ As one charity report put it:

*To many people living and working in Liverpool the conspicuous areas of vacant land seem the most pressing of such problem which the City needs to solve if Liverpool is not to continue down the spiral of decline.*²²⁴

Once again, we can see how the built environment was a key concern for contemporary policymakers, with dereliction seen as a major deterrent to urban economic investment. This is in part why the Merseyside Development Corporation in the early 1980s was so focused on the city's derelict docks. But vacant land was also a problem within communities. Derelict spaces were viewed as ripe for fly-tipping and petty criminality, and formed part of a social assemblage in which the everyday lives of 'inner city' residents were firmly linked to the surrounding environment and, crucially, the material objects within it. The amenity of the built environment therefore appeared to encapsulate wider social and economic changes, and lent material relevance to these more abstract processes of change. This was also shown

²¹⁷ Phil Topping & George Smith, *Government against poverty? Liverpool Community Development Project, 1970-75* (Oxford, 1977), p.19.

²¹⁸ For example, Shelter Neighbourhood Action Project, *Another chance for cities: SNAP 69/72* (London, 1972); Topping & Smith, *Government against poverty?*; Hugh Wilson & Lewis Womersley, *Change or decay: final report of the Liverpool Inner Area Study* (London, 1977).

²¹⁹ Worlock & Sheppard, *Better together*, p.146.

²²⁰ *Ibid.*

²²¹ Topping & Smith, *Government against poverty?* p.20.

²²² Liverpool Inner Area Study, *Vacant land: report by the consultants* (London, 1975), p. a.

²²³ *Ibid.*

²²⁴ Liverpool Council for Voluntary Service, *Vacant Land: Comments on the Inner Areas District Statements: proposals for the development of land resources* (Liverpool, 1977), p.2.

through contemporary urban photography, a device deployed by both state and non-state actors to show the 'reality' which lay behind their bounded volumes of statistics.²²⁵

Conclusion

The issues which I have very briefly outlined show how de-industrialization, understood as the loss of employment in the manufacturing sector, affected the social and built environment in inner Liverpool. In Liverpool, as well as other urban areas, this formed part of a process of 'urban decline'. As unemployment rose, derelict spaces proliferated. These derelict spaces were both a symptom of the city's industrial 'decline', and a barrier to its economic 'regeneration'. Unemployment was a problem in an economic sense, but it also had (at times) catastrophic social consequences as we can see in terms of family or household income. But when some urban areas evidenced unemployment rates in excess of 40 per cent, as parts of inner Liverpool did, then undoubtedly these social consequences became greater. These processes of change occurred at the same time as the population of the city continued to fall, pushed by poor employment prospects or drawn by the promises of state planning. This led to a situation in which the residents of the inner city were seen to have been 'left behind', bearing the brunt of urban economic, social, and physical change. Given this, it would be difficult to see how, within these spaces, de-industrialization and 'decline' can be considered mutually-exclusive.

²²⁵ See, for example, SNAP, *Another chance for cities*, pp.53-55; Wilson & Womersley, *Change or decay*, pp.61-80.

The rise and fall of Africa's bureaucratic bourgeoisie: Public employment and the postcolonial elites of Kenya and Tanzania

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Many scholars have characterized Africa's public servants as a privileged rentier class that grew disproportionately large after independence in relation to the continent's under-developed private sector. Is this characterisation accurate? Using Kenya and Tanzania as case studies, this paper establishes the share of high income households that derived their income from the public employment and how it changed over the postcolonial period.

An urban, African elite was slow to develop in British East Africa as colonial rule curtailed social upward mobility by restricting the economic activities open to Africans and limiting their opportunities to gain higher education.²²⁶ Africans in Kenya and Tanzania held less than a third of mid- and senior-level positions in government around 1960, and even fewer senior roles in private industries.²²⁷ Only towards the end of the colonial period did colonial governments begin a hurried expansion of the secondary and tertiary education systems with the explicit aim of educating Africans to the level required to replace European and Asian public servants in mid- and senior cadres. Colonial governments in East Africa also chose to retain the colonial wage structure, bringing Africans in senior positions up to the salary levels of their European predecessors, rather than establishing a new pay scale tailored to local market conditions.²²⁸ This concentrated most of the educated, high-earning manpower in the public sector. Around the same time governments introduced minimum wages for low-skilled urban workers, most of who worked in the public sector, which raised their earnings relative to unskilled rural workers.²²⁹

These conditions spawned various theories about public sector privilege. The neo-Marxist scholars of the 1960s and 70s predicted that the over-representation of politicians and public servants in the African national elite would create a rentier class that would align itself with foreign interests and hinder the emergence of an indigenous capitalist class.²³⁰ The public choice theorists of the 1980s shifted the focus from class to interest group.²³¹ They argued that civil servants and urban workers were disproportionately powerful interest groups that used their lobbying power to ensure high wages and low food prices, at the expense of an

²²⁶ Larry Diamond, "Class Formation in the Swollen African State," *The Journal of Modern African Studies* 25, no. 4 (1987): 567–96; Mahmood Mamdani, *Define and Rule: Native as Political Identity* (Cambridge and London: Harvard University Press, 2012).

²²⁷ Kenya. Ministry of Economic Planning and Development, "High-Level Manpower Requirements and Resources in Kenya, 1964-1970" (Nairobi, 1965); Government of Tanganyika, "Report of the Africanisation Commission" (Dar es Salaam: Government Printer, 1962); Uganda Protectorate, "Report of the Commissioners for Africanisation 1962, Part 1: Africanisation, Retention of Expatriates and Scholarships" (Entebbe: Government Printer, 1962).

²²⁸ Paul Bennell, "The Colonial Legacy of Salary Structures in Anglophone Africa," *The Journal of Modern African Studies* 20, no. 01 (November 11, 1982).

²²⁹ Frederick Cooper, *Decolonization and African Society: The Labor Question in French and British Africa* (Cambridge: Cambridge University Press, 1996).

²³⁰ Frantz Fanon, *The Wretched of the Earth* (New York: Grove Weidenfeld, 1963); Issa G. Shivji, *Class Struggles in Tanzania* (London: Heinemann, 1976); Mahmood Mamdani, *Politics and Class Formation in Uganda* (New York and London: Monthly Review Press, 1976); Giovanni Arrighi and John S. Saul, "Socialism and Economic Development in Tropical Africa," *Journal of Modern African Studies* 6, no. 2 (1968): 141–69.

²³¹ Robert H. Bates, *Markets and States in Tropical Africa: The Political Basis of Agricultural Policies* (Berkeley and London: University of California Press, 1981).

over-taxed peasantry. The neopatrimonialism school in contrast, which came to the fore in the 1990s, dispensed of both class and interest groups and instead highlighted ethnic fractures in African societies.²³² As a result, they argued, politicians ruled by dispensing patronage to ethnic leaders and their followers in exchange for political support.

While conceptualizing power dynamics in distinct ways, all three theories nonetheless rest on a similar analysis of Africa's postcolonial predicament: resources extracted from society were captured by public sector employees and therefore not invested productively. Furthermore, the lack of a healthy private sector limited government oversight, as there was no independent power base that could hold governments to account. Both of these assertions rest on the assumption that public servants comprised a large share of the comparative wealthy Africans, and that there was little change to these wealth and power relations after independence.

Yet existing empirical work on wages in the public sector tell a more complicated story. The colonial legacy of a protected, high-paid public sector elite did not persist in the postcolonial era. In Anglophone Africa in particular, public sector earnings fell rapidly after independence and public sector employees quickly lost whatever wage premium they had gained in the late colonial era.²³³ By the 1980s the African region did not stand out as having particularly large or highly paid public services compared to other regions.²³⁴

Furthermore, these theories rarely situate African public services within a broader literature on public sector labour markets. Public services are often large employers of highly educated manpower, and public servants are therefore disproportionately found in the upper end of the income distribution. In the United Kingdom today for instance (2014/15), public sector-headed households comprise 13 per cent of all households, but 22 per cent of households in the top income decile and 22 per cent in the top percentile.²³⁵

In light of this mixed evidence of a large and important public sector premium, this paper uses two case study countries – Kenya and Tanzania – to quantify the importance of public sector employment to the making of the African upper income strata. It starts with an overview of wage dynamics and then examines the share of public sector employees within the income elite.

The rise and decline in average public sector earnings

Figure 1 traces earnings in the public and private sectors as a multiple of GDP per capita. Consistent with the historical literature, Kenyan and Tanzania public sector employees saw a rise in relative earnings in the late colonial and early postcolonial period with the introduction of minimum wages and other wage awards. Between the early 1970s and mid-1990s, however, public sector earnings as a multiple of GDP per capita fell by almost 60 per cent from peak and trough in Kenya, and 70 per cent in Tanzania, followed by a recovery in the late 1990s. Over the same period the educational attainment of public servants rose rapidly,

²³² Patrick Chabal and Jean-Pascal Daloz, *Africa Works: Disorder as Political Instrument* (James Currey Publishers, 1999); Pierre Englebort, "Pre-Colonial Institutions, States, and Economic Development in Tropical Africa," *Political Research Quarterly* 53, no. 1 (2000): 7–36; Daron Acemoglu and James A. Robinson, "Why Is Africa Poor?," *Economic History of Developing Regions* 25, no. 1 (June 2010): 21–50; Michael Bratton and Nicolas Van De Walle, "Neopatrimonial Regimes and Political Transitions in Africa," *World Politics* 46, no. 4 (1994): 453–89.

²³³ Vali Jamal and John Weeks, *Africa Misunderstood, or Whatever Happened to the Rural-Urban Gap?*, ed. International Labour Organization (London: Macmillan Press Ltd, 1993); David L. Lindauer, *Rehabilitating Government: Pay and Employment Reform in Africa*, ed. David Lindauer and Barbara Nunberg (Washington D.C.: World Bank, 1994).

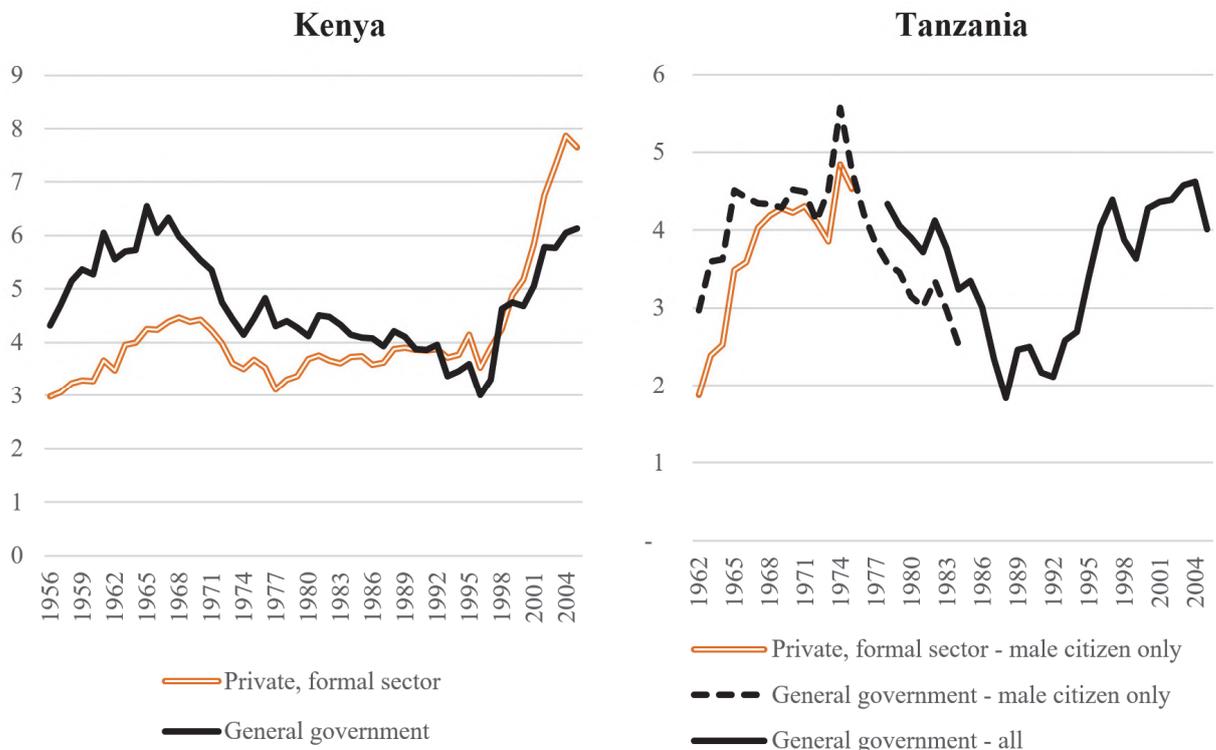
²³⁴ Arthur A Goldsmith, "Sizing up the African State," *Journal of Modern African Studies* 38, no. 01 (2000): 1–20.

²³⁵ Calculated from: National Centre for Social Research and Office for National Statistics. Social and Vital Statistics Division Department for Work and Pensions, "Family Resources Survey, 2014-2015 [Computer File]" (Colchester, Essex: UK Data Archive, 2016), <http://dx.doi.org/10.5255/UKDA-SN-8013-1> . *Head defined as the household member with highest income.*

thus average earnings understate the wage decline and overstate the recovery. While a consistent private sector control group is harder to establish, long-run data on salaries in the Kenyan formal private sector suggest that the decline was more severe in the public than private sector.

The fall in public sector earnings coincided with a growth in public employment. Governments traded public sector earnings for a higher overall level of employment between the early 1970s and 1990s, after which they restricted employment growth to allow average earnings to recover. In policy statements for this period governments explicitly prioritized job creation over the protection of salaries of those already in employment, and sought to correct excessive income inequality inherited from the colonial era by compressing the wage scale.²³⁶ From the 1990s in contrast, they recognized that salaries had fallen excessively and embarked on public sector reform programmes with support from the international donor community. This earnings decline was thus in part a policy choice, and challenges the theory of a political settlement designed to benefit a privileged public service.

Figure 1: Govt/private earnings as a multiple of GDP per capita²³⁷



The public sector share of the income elite

Yet big declines in average earnings did not necessarily mean that public servants fell in relative socioeconomic rank; depending on the size of the initial advantage and distribution of income, they may still have remained a large share of the wealthy strata of society. Cash earnings may also be a poor measure of the actual benefits stemming from public service, if part of the rent was captured in non-monetary benefits, opportunities for shirking, or outright

²³⁶ Government of Kenya, “Sessional Paper No. 10 of 1967, Proposals by the Government of Kenya for the Implementation of the Recommendations Contained in the Report of the Public Service Salaries Review Commission,” 1967; TANU, *The Arusha Declaration and TANU’s Policy on Socialism and Self-Reliance* (Dar es Salaam, 1967).

²³⁷ Kenya Economic Survey, 1960-1990; Kenya Statistical Abstracts, 1991-2010; Tanzania Survey of Employment and Earnings, 1961-1980, World Bank, Tanzania: Public Expenditure Review, various years; IMF, Tanzania: Recent Economic Developments and Article IV Consultation Reports, various years; World Bank, World Development Indicators 2015 (for CPI and labour force estimate). Please request full paper from author for full data details and discussion.

corruption. We therefore turn to household survey data to determine what share of wealthy households were headed by employees of the public sector in different decades. This analysis uses the top 1 per cent and top 10 per cent of household (on an income or consumption basis) as proxies for the upper and middle class respectively. These are arbitrary cut-offs but have the advantage of simplicity.²³⁸

The Kenyan analysis draws on household surveys from 1975, 1994 and 2005/06, and the Tanzanian on surveys from 1969, 1993, 2000/01 and 2011/12. All the surveys from the 1990s and 2000s are available in microdata form and households headed by public servants can be identified within the sample.²³⁹ In these surveys households are ranked on the basis of consumption per adult household member rather than income, as consumption is regarded as a superior measure of living standards in low-income contexts.²⁴⁰ The early results however, are derived from printed tables that provide the number of households by household income groups. These do not disaggregate the distribution on the basis of sector of employment. In order to estimate the public sector share the household income group data are compared with data on the wage distribution in the public sector. This presumes that each male public sector employee is the head of a household and his public sector earnings is the household's only source of income. This last assumption is particularly problematic as other surveys from the same period show that many public sector households had more than one source of income. It is therefore likely that the Tanzanian 1969 and Kenyan 1975 results are lower-bound estimates.

Even with a likely underestimation of the 1969 and 1975 estimates however, the results show a significant decline in the share of households in the top decile and percentile that were headed by public sector employees (tables 1 and 2). In Kenya the public sector share of the top decile fell from 35 per cent in 1975 to 18 per cent in 2005/06, while the top percentile share fell from roughly 30 per cent to 13 per cent. In Tanzania public sector employees fell from roughly a quarter of the top decile in 1969 to 16 per cent in 2011/12, and from roughly 42 per cent of the top percentile to 21 per cent in 2000/01, before rising again to 28 per cent in 2011/12, presumably as a result of the recovery in public sector salaries. The Tanzanian results have been broken down by general government and parastatal sector, given its large nationalization programme. The main decline since 1993 was in the parastatal sector as the government divested from industry.

As formal sector employees declined as a share of the top income or consumption brackets, households headed by self-employed business owners, many in the informal sector, increased in share. Counter to the neo-Marxist predictions then, an entrepreneurial class does appear to have emerged.

²³⁸ Piketty also uses the top 10% and 1% in his study of inequality: Thomas Piketty, *Capital in the Twenty-First Century* (Cambridge, Mass.: Belknap Press, 2014), chap. 8.

²³⁹ Analysis of robustness of the sampling and details of the variables used is available in the full paper, please request from author.

²⁴⁰ See discussion by: James Galbraith, *Inequality and Instability: A Study of the World Economy Just before the Great Crisis* (New York: Oxford University Press, 2012).

Table 1: Kenya: composition of the top income/consumption decile and percentile, by economic sector of the household head²⁴¹

Household head sector of employment	Top 10%			Top 1%		
	1975	1994	2005/06	1975	1994	2005/06
Public	35%	31%	18%	30%	31%	13%
Formal private	27%	23%	23%	47%	18%	34%
Informal sector / business	11%	35%	36%	}23%	42%	31%
Agriculture	28%	19%	12%		10%	4%
Other (retirees, students etc.)		2%	11%		-	18%

Table 2: Tanzania: composition of the top income/consumption decile and percentile, by economic sector of the household head²⁴²

Main activity of household head	Top 10%				Top 1%			
	1969	1993	2001	2011/12	1969	1993	2001	2011/12
Public	25%	24%	19%	16%	42%	36%	21%	28%
<i>Government</i>	18%	17%	13%	14%	28%	21%	8%	18%
<i>Parastatal</i>	7%	7%	6%	2%	14%	15%	13%	10%
Formal private	14%	10%	15%	24%	24%	18%	15%	20%
Informal sector / business		33%	26%	35%		33%	40%	39%
Agriculture (or fishing)	}61%	30%	33%	20%	}34%	13%	19%	10%
Other (retirees, students etc.)		3%	6%	5%		3%	3%	

Household surveys are imperfect instruments for studying the very top of the income distribution, however, as wealthy households are few in number and often avoid enumeration.²⁴³ Another way of gleaning the current composition of the elite, which should suffer less from this under-enumeration and measurement errors, is to examine the sector of employment of asset wealthy households using comprehensive census data. The Kenyan 2009 census included three asset questions – ownership of a car, refrigerator and computer – that are hallmarks of high living standards. Households owning all three assets are classified as asset wealthy; such households constitute just above 1 per cent of all Kenyan households. Of this asset wealthy class, public sector-headed households constituted 20 per cent.²⁴⁴ Slightly higher, then, than the 13 per cent 2005/06 estimates, but nonetheless indicative of a significant fall since the 1970s.

For Tanzania we use the 2014 labour force survey as a robustness check, and designate the asset wealthy as those with a car, refrigerator, electric or gas stove and flush

²⁴¹ Kenya National Bureau of Statistics, *Integrated Household Budget Survey 2005/06* (Nairobi); Kenya National Bureau of Statistics, *Welfare Monitoring Survey 1994, Second Round* (Nairobi). 1975 distribution constructed from the integrated rural survey, annual enumeration of employees, and the income tax annual report; published in: Kenya Central Bureau of Statistics, *Statistical Abstract 1980* (Nairobi); Livingstone, I. *Rural development employment and incomes in Kenya* (Geneva: International Labour Organisation, 1981).

²⁴² Tanzania National Bureau of Statistics. *1969 Household Budget Survey, Volume 1* (Dar es Salaam, 1972); Tanzania Bureau of Statistics, *Survey of Employment and Earnings 1969* (Dar es Salaam, 1969); University of Dar es Salaam, *Tanzania Human Resource Development Survey 1993* (Dar es Salaam); Tanzania National Bureau of Statistics, *Household Budget Survey 2000/01 & Household Budget Survey 2011/12*, (Dar es Salaam).

²⁴³ Anthony B. Atkinson, *Inequality: What Can Be Done?* (Cambridge and London: Harvard University Press, 2015).

²⁴⁴ Minnesota Population Center., “Kenya 2009 Population and Housing Census, Integrated Public Use Microdata Series, International: Version 6.3 [Machine-Readable Database].” (Minneapolis: University of Minnesota, 2014).

toilet. This group comprised just over 1 per cent of the population. Public sector-headed households constituted 30 per cent of this asset wealthy group; a similar estimate to that from the 2011/12 survey.²⁴⁵

Conclusions

A popular explanation for Sub-Saharan Africa's relative under-development is its rent-capturing public service, which supposedly dominated the upper tail of the income distribution and prevented a more productive 'bourgeoisie' from emerging. Yet few studies have quantified this public sector dominance. This paper has shown that public servants were far from the only members of the comparatively prosperous strata of Kenyan and Tanzanian society in either the 1970s or today, and that whatever wage premium they inherited at independence quickly declined thereafter. As a result, their shares of the top income brackets fell over time. Today public sector employees in Kenya and Tanzania are a lower share of the top decile than they are in the United Kingdom. This challenges theories that presume that public sector employment explain Africa's economic outcomes. It also provides some cautiously positive signs of labour market transformation, with a rising share of self-employed business owners among today's prosperous Kenyans and Tanzanians.

²⁴⁵ Tanzania National Bureau of Statistics, *Integrated Labour Force Survey 2014* (Dar es Salaam, 2015).

Legacies of inequality: The case of Brazil

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Contemporary economic literature has witnessed a renewed focus on discerning and quantifying the effects of inequality. Nevertheless, a general consensus has yet to emerge on its consequences. In this paper, I offer a contribution to this literature by exploring the effects of long-term inequality within Brazil. I introduce a new index capturing the suitability of land for plantation over smallholder agriculture to instrument for the municipal-level distribution of land ownership in a two stage least squares instrumental variables framework. A key theme of this paper is that inequality is in part determined by those environmental conditions which govern the relative suitability of land for plantation versus smallholder agricultural production. I argue that this historical distribution of land has influenced the structure of local institutions, the persistence of economic inequality over time, as well as contemporary economic and social outcomes. Here Brazil is a useful case study, as the country's long agrarian history has made land a uniquely valuable asset which should proxy well for broader inequality in welfare.

Economic research remains divided on the potential socio-economic effects of inequality. Some economists have suggested that positive consequences could accrue from widespread disparities in income. St. Paul and Verdier (1993) as well as Galor and Tsiddon (1997) suggest that inequality may increase human capital accumulation, and therefore technological advancement and economic growth. Empirical support for this reasoning has been provided by Forbes (2000), who finds a positive relationship between country-level inequality and growth. Conversely, Alesina and Rodrik (1994) and Persson and Tabellini (1994) incorporate distributional conflict among agents into their theoretical models to show that high inequality may lead to adverse economic outcomes. Many cross-country empirical studies seem to support such results: Perotti (1996) and Deininger and Squire (1996) show that nations with higher initial asset inequality witness less investment in public education and lower long-run growth, respectively. This relationship seems to hold within countries as well: For example, Enamorado et al. (2016) find that increases in inequality are associated with increases in crime in Mexican municipalities.

Agriculture has long been intertwined in the social and economic fabric of Brazil. Sugarcane production during the colonial era (1500-1822) resulted in the formation of a powerful agrarian elite, whose wealth derived from large-scale plantation agriculture and the use of slave labour. In the nineteenth century, a new landed elite arose with the advent of coffee production around São Paulo and Minas Gerais. In general, these large scale landowners favoured development only if it served their own economic interests and home locales: nearly all were united in opposing trade unions and other forms of civil society deemed hostile to the status quo. Nevertheless, the prevalence of plantation agriculture and the distribution of land holdings were not uniform throughout Brazil. Heterogeneity in climate and other factor endowments led to differences in the magnitude of inequality and the rigidity of the social structure (Assunção, Naritomi & Soares 2012). Although large-scale landowners may have wielded power regardless of their location, the extent of their holdings likely varied according to a variety of factors, among them the suitability of agro-climatic conditions for plantation production.

The analytical framework of this paper can thus be visualized as follows:



Note that institutional persistence is a key element of this framework. If the structure of early municipal institutions depended on the relative power of an agrarian elite, this structure should still manifest today, even though the population is mostly urban and the economy is largely non-agricultural. I therefore use municipal public welfare spending to quantify the extent to which local institutions are elite dominated. The reasoning is straightforward. A municipality characterized by a small agricultural elite may yield a social system built around its interests instead of those of the general public. This system might be very different from one with a more egalitarian distribution of land, where elites have relatively less power. It would therefore seem reasonable to suppose that elite dominated institutions would manifest in lower levels of welfare spending, since such spending reflects the degree to which ruling authorities are willing to expend resources for the benefit of the general public.

I obtain data on education, health, and economic outcomes from demographic censuses of Brazil. The historical distribution of municipal-level landholdings is available from the 1920 census of agriculture. It is the first census for which Gini coefficients can be calculated from a piece-wise Lorenz curve (there are 10 farm size bins in this census). Data on historical municipal welfare spending for the year 1923 is available from the *Estatística das Finanças do Brasil*, published in 1926. Contemporary information on such spending is available from Brazil’s Institute of Applied Economic Research. The plantation suitability index is based on data from WorldClim, which contains long-run precipitation and temperature data on .5 arc-second (roughly 1km by 1km) global grid. Since municipal boundaries have changed substantially over the twentieth century, the units of analysis are “Minimum Comparable Areas”, or AMCs. These consist of one or more municipalities whose boundaries are the same in 2000 as they were in 1920.

The plantation suitability index (PSI) is based on the temperature and precipitation requirements of specific crops which are held to be uniquely smallholder or uniquely plantation in their method of production. This method of crop production is assumed to be partly dependent on the biological characteristics of the plants themselves. I therefore use the scientific taxonomies of certain crops and their associated temperature and precipitation requirements to characterize a plantation or smallholder climate. Growing conditions of food crops in the *Pooideae* subfamily and *Phaseolus* genus are used to identify a smallholder climate. Common *Pooideae* crops include wheat, barley, oats, and rye; the *Phaseolus* genus includes myriad bean species. Biologically, the former crops thrive in cold weather, while the latter are well-suited to dry conditions. Climactic conditions for plantation agriculture are based on crops from the *Coffea* (Coffee) and *Saccharum* (Sugarcane) genera. Importantly, I consider the production method of crops not belonging to these groups to be endogenous to the climate. Maize, for example, can grow in a wide variety of climactic conditions: Its scale of production is therefore assumed to depend on whether smallholder or plantation conditions predominate.

In this context, an instrumental variables strategy can obviate the problems of endogeneity that are inherent to a standard ordinary least squares specification, and can thus allow for a causal interpretation of estimates. A valid instrumental variables strategy requires that, conditional on included controls, the effect of the PSI on economic and institutional outcomes is solely through inequality. The nature of this index suggests several important controls. To account for the disease environment, I utilize the Malaria Severity Map of

Kiszewski et al. (2004). Additionally, isolated municipalities located further inland may develop differently from those closer to the major trade and population centres on the coast. Since climactic conditions can vary with distance from the ocean as well, I include controls for a municipality's distance from the coast. Lastly, the PSI may conceivably be correlated with a more benign climate for agriculture in general. To account for this possibility, I use data on the suitability of land for agricultural production compiled by Ramankutty et al. (2002).

Table 1 presents first stage regressions of 1920 AMC-level land inequality on the PSI and other controls. The land Gini is scaled from 0 to 100. For ease of interpretation, the index is normalized with a mean of zero and a standard deviation of one. The F-statistic of 26 (in column one) is well above the threshold value of 10 that is generally considered indicative of weak instruments. The coefficient implies that a one standard deviation increase in the PSI is associated with an increase of 2.3 in the Gini index, or an increase of .17 standard deviations. The PSI retains its significance and magnitude as the above controls are included.

Table 1: *Regression of land Gini on PSI and other controls*

1920 Land Gini	(1)	(2)	(3)	(4)	(5)
Plantation Suitability Index	2.329*** (0.453)	2.525*** (0.497)	2.525*** (0.497)	2.606*** (0.493)	2.870*** (0.500)
Malaria		-0.495 (0.462)	-0.495 (0.462)	-0.789* (0.458)	-0.881* (0.457)
Log Distance to Coast				1.157*** (0.334)	1.177*** (0.339)
Suitability for Agriculture					5.570*** (2.137)
Constant	62.45*** (0.433)	62.45*** (0.433)	62.45*** (0.433)	49.45*** (3.855)	47.36*** (4.062)
Observations	942	942	942	942	942
R-squared	0.030	0.031	0.031	0.050	0.057
F-test	26.49	13.55	13.55	12.08	10.60

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The impact of historical land inequality on historical institutions is presented in tables 2 and 3. The specifications in table 2 use OLS, while table 3 reports the IV estimates. I define welfare spending as the percentage of the municipal budget devoted to funding for education, health, public works, and public electricity. I omit spending on the salaries of elected officials, government administration, police and security, and payments on existing municipal debts. On average, AMCs devoted nearly 40 per cent of their budget to such welfare spending. While both the OLS and IV specifications show a significantly negative effect of inequality on historical welfare spending, the IV estimates are much larger in magnitude. The most complete specification (column four) would suggest a unit increase in predicted inequality to be associated with a .13 percentage point decline in welfare spending in the OLS specification, versus a 0.76 percentage point decline in the IV specification.

Table 2: *Historical inequality and institutions: OLS specification*

Welfare Spending as % of Municipal Budget (1923)	(1)	(2)	(3)	(4)
1920 Gini	-0.140*** (0.0457)	-0.134*** (0.0452)	-0.130*** (0.0452)	-0.134*** (0.0450)
Malaria		-2.959*** (0.617)	-2.912*** (0.619)	-2.905*** (0.618)
Log Distance to Coast			-0.266 (0.346)	-0.252 (0.343)
Suitability for Agriculture				6.527** (2.970)
Constant	51.80*** (2.958)	51.28*** (2.927)	54.03*** (4.704)	51.99*** (4.728)
R-squared	0.012	0.040	0.041	0.047
Observations	843	843	843	843

Table 3: *Historical inequality and historical institutions: IV specification*

Welfare Spending as % of Municipal Budget (1923)	(1)	(2)	(3)	(4)
1920 Gini	-1.457*** (0.413)	-0.946*** (0.351)	-0.926*** (0.335)	-0.760** (0.296)
Malaria		-2.718*** (0.735)	-2.810*** (0.716)	-2.836*** (0.681)
Log Distance to Coast			0.490 (0.565)	0.336 (0.524)
Suitability for Agriculture				8.796*** (3.332)
Constant	134.1*** (25.89)	102.1*** (22.02)	95.38*** (18.07)	83.75*** (15.55)
Observations	843	843	843	843

Empirical support for the persistence of inequality can be obtained by regressing metrics for the contemporary distribution of land or income on inequality from 1920. I use Gini indices for both the distribution of land and per capita household income for this purpose. Results are presented in table 4. The first column suggests that a one unit increase in land inequality from 1920 is associated with a .1 unit increase in land inequality in 2006, while the second suggests that a one unit increase in 1920 inequality is associated with a 0.04 unit increase in 2000

income inequality. Although significant, the relatively low magnitude in column one may be due to the fact that the 2006 Ginis are calculated from more bins of farm sizes than the 1920 measures. Similarly, there is less variation in per capita household income inequality in 2000 than land inequality in 1920: nevertheless, a one standard deviation increase in 1920 land inequality is still associated with a 0.12 standard deviation increase in 2000 income inequality.

Table 4: *Persistence of inequality*

	(1) Land Gini 2006	(2) Household Income Gini 2000
Land Gini 1920	0.108*** (0.0260)	0.0405*** (0.0111)
Constant	68.23*** (1.663)	52.88*** (0.702)
R-squared	0.025	0.015
Observations	942	942

Tables 5 and 6 report the OLS and IV specifications for the effect of 1920 inequality on contemporary welfare spending. Here I define welfare spending as the percentage of the AMC-level budget devoted to education and culture, assistance and welfare, health and sanitation, and regional development. On average, AMCs devote 35 per cent of their budget to such spending. While OLS estimates show a negligible impact of historical inequality on contemporary institutions, the IV estimates suggest the impact is substantial: For example, column 4 of table 5 suggests a one unit increase in predicted inequality is associated with a 0.49 percentage point decrease in welfare spending.

Table 5: *Historical inequality and contemporary institutions: OLS specification*

Welfare Spending as % of Municipal Budget (1995-2000 Average)	(1)	(2)	(3)	(4)
1920 Gini	0.00316 (0.0183)	0.00410 (0.0184)	-0.00539 (0.0184)	-0.00575 (0.0184)
Malaria		-0.335 (0.237)	-0.468** (0.238)	-0.467* (0.238)
Log Distance to Coast			0.611*** (0.155)	0.612*** (0.156)
Suitability for Agriculture				0.582 (1.236)
Constant	35.37*** (1.148)	35.31*** (1.155)	29.03*** (2.047)	28.84*** (2.166)
R-squared	0.000	0.002	0.020	0.021
Observations	942	942	942	942

Table 6: *Historical inequality and contemporary institutions: IV specification*

Welfare Spending as % of Municipal Budget (1995-2000 Average)	(1)	(2)	(3)	(4)
1920 Gini	-0.561*** (0.139)	-0.552*** (0.139)	-0.520*** (0.129)	-0.485*** (0.118)
Malaria		-0.0498 (0.325)	-0.332 (0.310)	-0.336 (0.300)
Log Distance to Coast			1.175*** (0.278)	1.142*** (0.261)
Suitability for Agriculture				1.891 (1.555)
Constant	70.60*** (8.731)	70.07*** (8.666)	54.83*** (7.121)	52.42*** (6.677)
Observations	942	942	942	942

The framework presented here supposes that low socio-economic welfare will be a salient feature of unequal areas with elite dominated institutions. To test this hypothesis, I utilize the AMC-level Human Development Index. Like its country-level counterpart devised by the UNDP, the index accounts for schooling, health, and income. Tables 7 and 8 present OLS and IV specifications for the effect of historical inequality on human development for the year 2000 (the most recent year for which AMC-level HDI is available). Mean HDI (scaled from 0 to 100) is 70. OLS results suggest a positive, although fairly negligible, impact of historical inequality on HDI. Conversely, IV estimates suggest that historical inequality exerts a strong negative impact on human development. For example, column four of table 8 suggests that a one unit increase in predicted inequality is associated with decrease of 0.38 points in HDI.

Table 7: *Historical inequality and human development: OLS specification*

AMC-level HDI	(1)	(2)	(3)	(4)
1920 Gini	0.0197 (0.0206)	0.0356** (0.0158)	0.0243 (0.0163)	0.0285* (0.0156)
Malaria		-5.640*** (0.170)	-5.799*** (0.169)	-5.819*** (0.171)
Log Distance to Coast			0.730*** (0.184)	0.707*** (0.178)
Suitability for Agriculture				-6.717*** (0.934)
R-squared	0.001	0.484	0.504	0.532
Observations	942	942	942	942

Table 8: *Historical inequality and human development: IV specification*

AMC-level HDI	(1)	(2)	(3)	(4)
1920 Gini	-1.233*** (0.268)	-0.306** (0.134)	-0.277** (0.114)	-0.379*** (0.115)
Malaria		-5.465*** (0.238)	-5.720*** (0.218)	-5.708*** (0.247)
Log Distance to Coast (km)			1.060*** (0.267)	1.157*** (0.280)
Suitability for Agriculture				-5.605*** (1.261)
Constant	146.8*** (16.74)	88.93*** (8.344)	75.18*** (6.317)	82.32*** (6.548)
Observations	942	942	942	942

The analysis presented here suggests that inequality may pose a substantial barrier to long run development. More conclusive empirical evidence will need to account for other factors, such as immigration, which are important determinants of development in the Brazilian context. Furthermore, this analysis has assumed institutions to be the channel through which inequality yields poorer socio-economic outcomes, yet such an assertion needs further empirical validation. These initial results, however, would seem to suggest a promising context for the study of inequality and development.

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Tracing global poverty paths, 1925-2010

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Global poverty, both historically and contemporary, is investigated only via the assumption of purchasing power parity (PPP) equivalence (Ravallion et al., 1991; Bourguignon and Morrisson, 2002; van Zanden et al., 2011). This translates to the use of poverty lines (henceforth PL) expressed in a number of PPP dollars per day. However, the methodology applied to derive these poverty lines has received extensive criticism by scholars for requiring the application of PPP exchange rates and consumption price indexes (CPI) that are not constructed to capture the consumption habits of those who live in poverty (Deaton, 2010; Reddy and Pogge, 2010; Srinivasan, 2009). Those methodological objections cast reasonable doubts over the available estimates for the evolution of global poverty in recent years (Moatsos, 2015), and even more so historically.

The alternative that I follow is to construct a set of goal oriented welfare specific PLs using local prices. Those PLs are often dubbed as bare bone consumption baskets (BBB) in their most basic form (Allen, 2013). Calories and proteins are used as achievement elements, and linear programming is applied to estimate the minimum cost that allows an individual to reach the defined welfare level. The main advantage of this methodology is its consistency in measuring poverty in time and space, as the welfare component is, as far as possible, maintained fixed. The method, despite its global reach, is applied here on a few countries scattered around the globe that operate as feasibility test cases.²⁴⁶ To account for various sources of uncertainty in the estimates, and provide appropriate confidence intervals the Monte Carlo technique for pseudo-experiments is used.²⁴⁷

Methodology

A family of elements is considered when constructing a PL. Those include anthropometric and demographic information (age/gender distribution, height, and the intensity of physical activity), as well as environmental parameters (food nutrients, temperature and heat energy requirements). Additional socioeconomic data (prices, income distribution data, and aggregate consumption shares) are required to derive a poverty rate. Each element is introduced with a reasonable (usually uniform) distribution in the Monte Carlo pseudo-experiments to capture the uncertainty of the data at hand.²⁴⁸

The anthropometric and demographic dataset the minimum dietary energy requirement (MDER) which constitutes the caloric target of the consumption basket underlying the PL. In its estimation I follow the method of FAO (2008).²⁴⁹ The level of the MDER changes following the evolution of the aforementioned characteristics. The reason for including MDER as a dynamic element is that the poverty level within a population should be evaluated based on the characteristics of that population. The alternative of keeping the MDER constant implies a systematic overestimation (when the characteristics demonstrate degrading) or underestimation (when upgrading). The height data used come from Baten and Blum (2015). Population age and gender distributions come from Mitchell (2007) and United Nations

246 Those are Kenya, Egypt, Italy, the Netherlands and the United States. In later stages of the project more than 85% of global population will be included.

247 Due to the nature of the exercise results should be treated as first estimates until more refined data and data treatments are subsequently added in later versions of this paper. For example, accounting for the relative element introduced by the price index differentials between food and non-food components (Subramanian, 2010, p.34-35).

248 Further elaboration on the exact nature of those distributions requires more space than available in this short paper. The interested reader is referred to later and more detailed versions of this paper.

249 They are applied along with the corrections mentioned in Moatsos (2015) and Allen (2013).

(2015). The physical activity levels (PAL) are composed during the Monte Carlo phase of the calculations from various activity elements as listed in FAO (2001). This composition results in PAL values that form normal distributions. The use of distributions is necessary since we are not certain about the exact PAL of those living in conditions of poverty.

Table 1: *RGB Poverty Lines Components*²⁵⁰

Item	Unit/Year	Poverty Line Short Name		
		Red	Green	Blue
Energy Target	kcal	MDER	MDER	MDER
Protein Target	gr	40	40	40
Minimization	-	cheapest bundle	mean of 2 cheapest bundles	mean of 3 cheapest bundles
Main staple	kg	based on kcal/protein target		
Beans or peas	kg	LP	20 at minimum	40 at minimum
Meat or fish	kg	3 or 6	6 or 12	12 or 24
Butter or oil or ghee	kg	3	6	12
Sugar	kg	2	4	8
Linen (applied)	share	8%	8%	8%
Lamp oil	liter	the equivalent of 1.3 liter added as fuel		
Soap	kg	1.3	1.3	-
Candles	kg	1.3	1.3	-
Fuel	mbtu	f(T in °C)	f(T in °C)	f(T in °C)
Cooking	mbtu	MDER/2	MDER/2	MDER/2
Housing	share	5%	10%	15%
Health, Education, Water	share	-	WBGC	WBGC
Surplus	mark-up	-	-	10%

As shown on table 1, a number of basic nutrient sources are used in linear programming (LP) to solve the problem of cost minimization of the consumption basket.²⁵¹ A main staple is the core source of kcal and proteins, accompanied by a fixed consumption of meat (or fish if it is cheaper), beans (or peas if cheaper), butter (or ghee if cheaper), and sugar. The PLs used here are three so that a wider area of welfare levels is covered. To avoid implicit judgment on the welfare conditions of each PL the RGB colour coding of the three basic colours is used for short-hand naming them. Red PL contains the most basic elements for scraping a living. Green PL relaxes one step the assumption that those living in extreme poverty apply LP to consume the cheapest possible nutritional bundle, and thus it takes the average of the two cheapest bundles. It also doubles the relative allowance of housing, compared to the Red PL, and adds explicit expenses for health, education, and water.²⁵² Blue PL builds upon the Green, uses the average of the three cheapest combinations, and doubles again the allowance for meat (or fish), butter, sugar, while including a 50 per cent increase in the housing allowance. Finally, an explicit percentage is added an all-purpose surplus indicating additional implicit choices made possible on this welfare level. All bundles include energy needed for cooking the purchased food when necessary.

The temperature and heat energy requirements are included so that the PLs are consistent in evaluating poverty between countries with different prevailing temperatures as well as between years with such differences for the same country. The aforementioned requirements are calculated following the concept of degree-days (The Chartered Institution

²⁵⁰ Fuel data are imputed and they can be at maximum half the food component, see Moatsos (ibid) for more details.

²⁵¹ For the values of the various nutrients in the food items the USDA database was used (<https://ndb.nal.usda.gov/ndb/>). To the values of kcal a retention rate is applied as pointed out and provided by Appleton et al. (1999).

²⁵² For lack of better readily available evidence, the share for those components from the World Bank's (contemporary) Global Consumption database is used throughout. For developed countries the average shares for the higher income segment was used, and for developing ones the low segment.

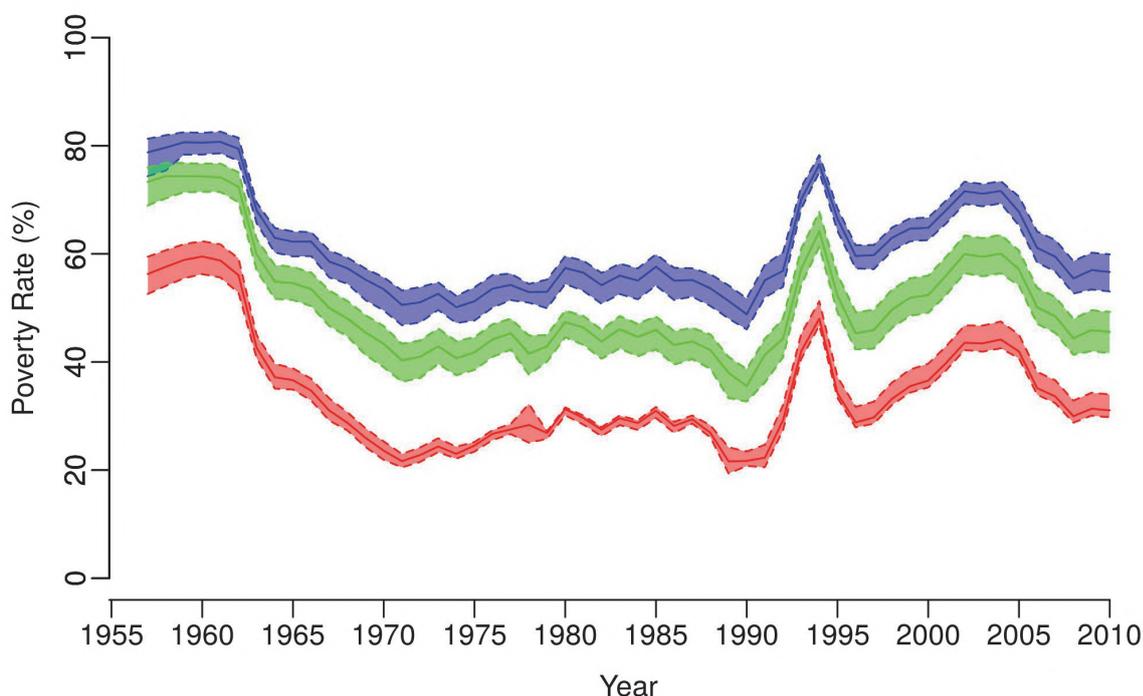
of Building Services Engineers, 2006). Degree-days give the number of total day equivalents in a year where indoor heating is required.²⁵³ The base (threshold) outside temperature used is the (now standard) 15.5 degrees Celsius, which corresponds to an indoor temperature of about 18. This indoor temperature is recommended by WHO to avoid chronic health deterioration (Collins, 1986). The temperature data come from the Global Historical Climatology Network.²⁵⁴

The prices used in the calculations come from the ILO October inquiry. They include data from 1925 up until 2008, when ILO stopped publishing them. The price catalogue consists of a wide range of necessities, and the exact number of products varies with the country-year combination. Information on average inflation rates was used to impute missing prices (de Zwart, 2015). Data on the gross income distributions are taken from van Zanden et al. (2011), since the more appropriate consumption distributions are not available for the long run character of this investigation. When for a given year no distribution is available, linear interpolation is applied. The mean of the distribution is fixed on the national consumption per capita. Consumption data come from the World Bank,²⁵⁵ the UC Davis Nominal GDP historical series, and the Jord-Schularick-Taylor macrohistory database. For missing years linear interpolation was used on the basis of GDP per capita evolution (Bolt and van Zanden, 2015).

Results

For the sake of the required brevity, only a few selected countries are presented in the figures below, along with a brief discussion. Every graph shows, in its respective colour, each of the three poverty lines as defined in table 1, accompanied by the 95 per cent confidence interval.

Figure 1: *Evolution of global poverty lines in Kenya*



253 Moreover, I assume that the house is empty for 8 hours per day, then residents are sleeping for another 8 hours (not requiring heating), and for the remaining 8 hours per day heating is required. For simplicity this is included in the calculations by dividing the total number of degree-days by 3.

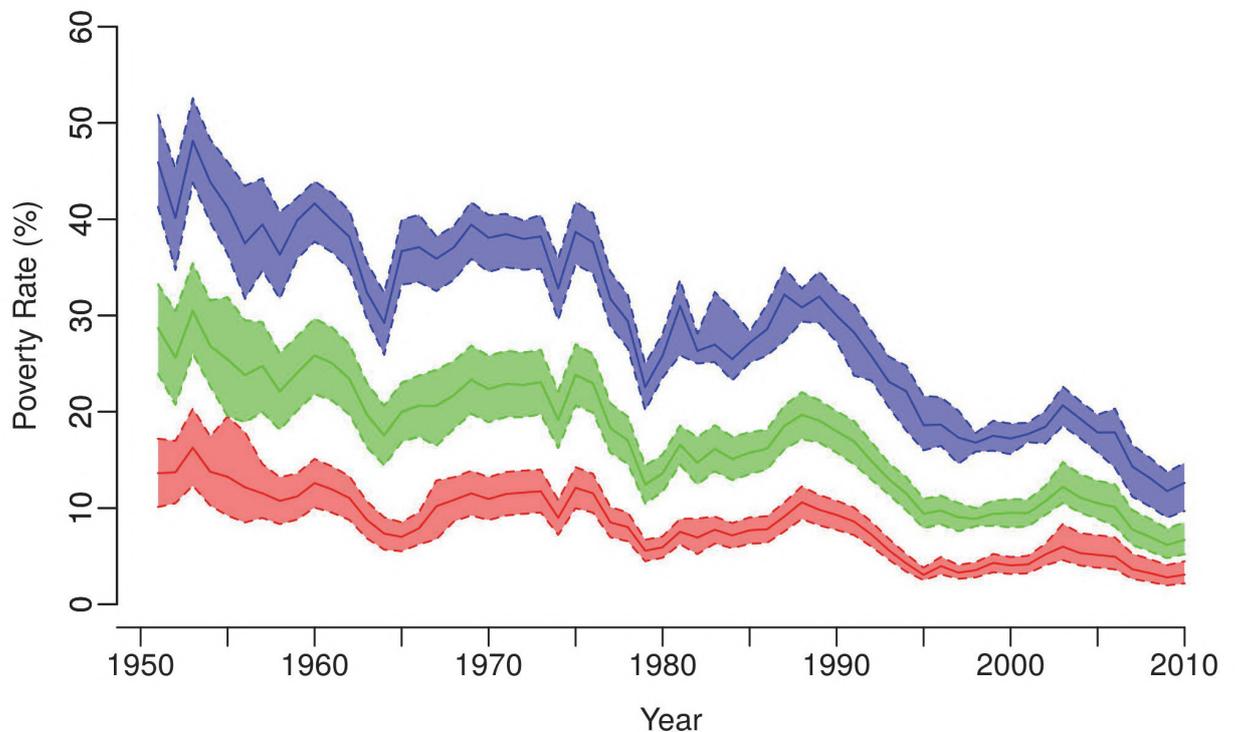
254 Menne, M.J., I. Durre, B. Korzeniewski, S. McNeal, K. Thomas, X. Yin, S. Anthony, R. Ray, R.S. Vose, B.E. Gleason, and T.G. Houston, 2012: Global Historical Climatology Network - Daily (GHCN-Daily), Version 3.22.

255 GDP and “Household final consumption expenditure, etc” (both in current LCU), accessed Dec. 9th 2016.

All RGB lines paint the very intense picture of the poverty evolution in Kenya (figure 1). Despite the great improvements in the early years of the period covered by the data (1955-70), poverty intensity has since then overall increased. However, after two distinguishable episodes in 1993/4 and in 2003/4, in recent years some improvement is in progress. Nonetheless, Red PL poverty has never dropped lower than 20 per cent, Green poverty below 30 per cent, and Blue below 40 per cent. All minima are reached by the late 80s; however they are not very different from those of the early 70s, demonstrating stagnation and reversal.

The observation period for Egypt is 1950-2010 as shown in figure 2. Egypt starts at substantially high poverty rates, which, however, stand very close to the minimum values achieved by Kenya throughout. Despite some volatility, the downward trend is present in the entire period. One can notice a series of inverted u-shapes in the depicted lines. Those are between 1965-79, 1980-98, and 1999-2010. As we will see next, the poverty rates in 1950 track closely those in 1925 Italy, and by 2010 they closely resemble those in 1925 Netherlands.

Figure 2: *Evolution of global poverty rates in Egypt*



The effect of WWII in the Netherlands dominates figure 3. Following a substantial rise after 1940, the “hunger winter” of 1944 is the spike that shoots all PLs in tandem. During the first period, of 1925-40, the prevalence of even the most austere Red PL, is non-negligible, while Blue level poverty hovers around a substantial 20 per cent, with a declining trend at the end of this period. The pre-1940 trend continues only after 1952/3, and all three PLs become obsolete by the late 60s.

Compared to the Netherlands, Italy starts with much more substantial poverty figures at all levels. And this is by far more notable for the Red PL. The downward trend that started after 1929 is interrupted by WWII in 1939. Poverty increases massively by the end of the war, at levels clearly beyond 70 per cent for all types of PLs. The recovery period takes about as much time as in the Netherlands, but the recovery rate is not as sharp.

Figure 3: *Evolution of global poverty rates in the Netherlands*

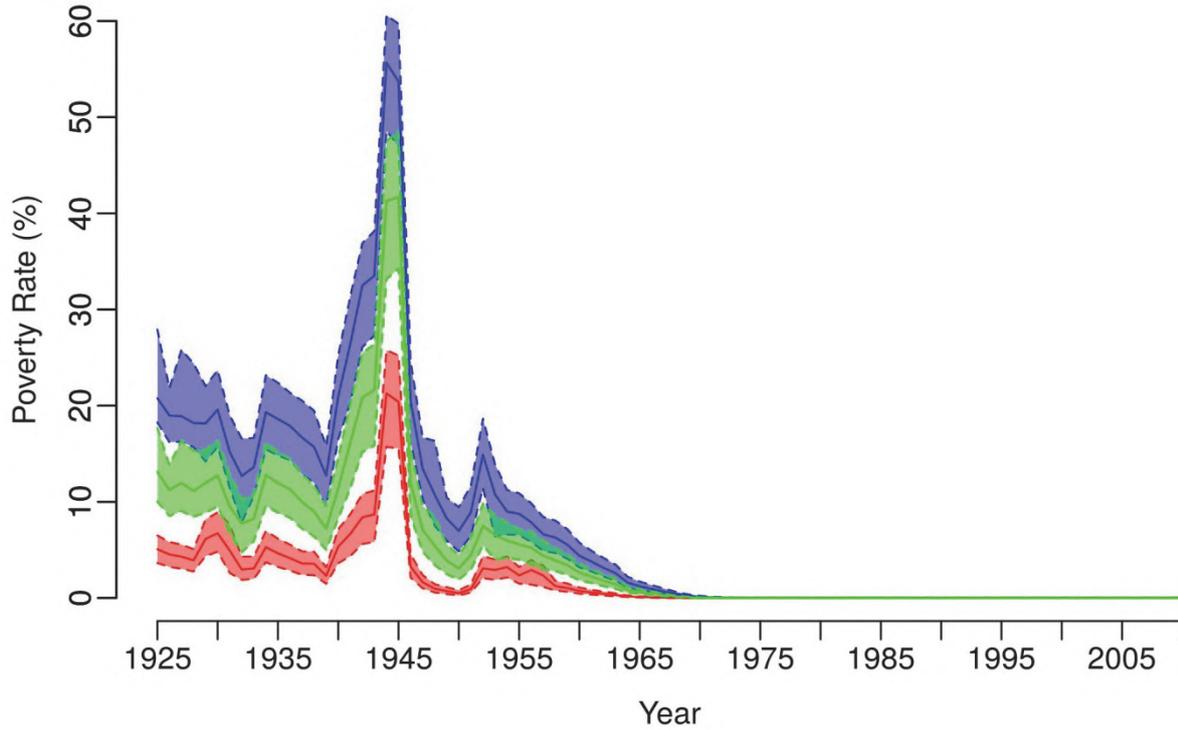
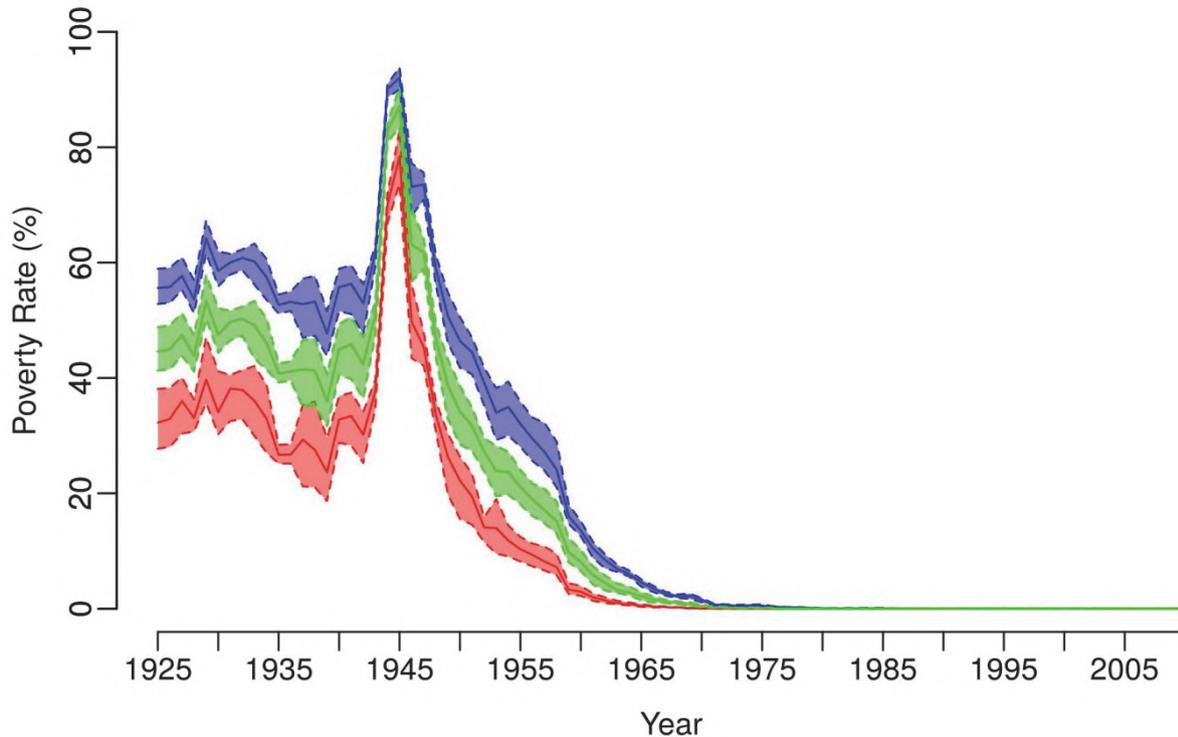
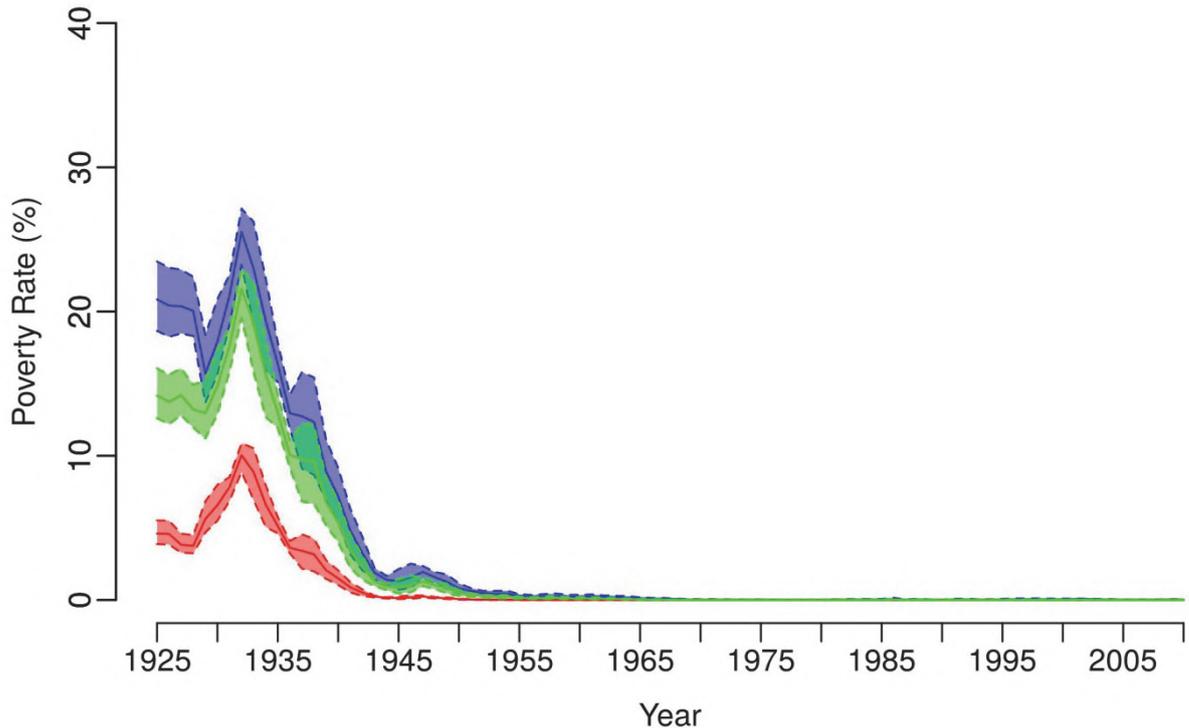


Figure 4: *Evolution of global poverty rates in Italy*



Poverty rates for the United States start at similar levels as in the Netherlands in 1925. However, the crash of 1929 substantially amplifies the prevalence of poverty at all PL types. From that point on the reduction of all traced types of poverty is an impressive one, and is only briefly and rather “lightly” interrupted in the aftermath of WWII. Thus, in the period before the end of WWII where poverty was claiming a strong foot in the two European countries, the United States demonstrated a sharp reduction. In subsequent periods, they achieved small poverty rates some 10-20 years in advance of Italy or the Netherlands.

Figure 5: Evolution of global poverty rates in the United States



Conclusions

A first attempt to consistently trace the evolution of global poverty paths throughout the twentieth century has been presented here for a small number of countries. The method and the data used have certain limitations that must be acknowledged. First, the methodological focus is entirely in a one-dimensional (material) poverty, and our method excludes multidimensional poverty considerations. Second, a number of methodological improvements, too numerous to mention here in detail, can be implemented to provide a more solid framework for drawing conclusions. One example is to use population weighted temperatures to calculate more accurately the relevant degree-days. Third, the data utilized, e.g. the gross income distributions, are not the most appropriate ones for the purpose of poverty measurements, and further research is needed to pinpoint the margin of error with respect to more appropriate data when available.

Nonetheless, this research has demonstrated the feasibility to construct standardized poverty lines for historical research implemented in such a way that basic statistical comparisons (e.g. statistical significance) can be performed. Moreover, the identified trajectories in poverty levels provide an in depth glance at the development stages at well-defined welfare levels within a country, that are – with certain data limitations – comparable globally. Expanding the set of countries and the time period covered is next in this project.

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Honest Elites?

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Introduction

Poor countries are often poorly governed. Young nations without many democratic institutions and traditions can be particularly hit by bad governance. The rulers can control power by distributing favours in exchange for political support. Put bluntly the rulers exploit the majority in order to favour the minimal coalition of necessary supporters. Favouritism of some sort seems to be typical for nations with weak democratic institutions and a new state apparatus with limited capacity.²⁵⁶ Yet one might wonder whether this is all? Can we never have honest elites from the start? The immediate material rewards to good guys may be less, but the positive link between good governance and long term economic development may create considerable long term rewards.

In this paper I investigate the extent of favouritism in the establishment of institutions and a new state administration in a country that today is characterized by good governance and high GDP per-capita. Specifically, I will use the process of founding a central bank to investigate the extent of favouritism in the newly established government in Norway in 1814.

The first part of the investigation looks at how the law concerning the funding of the bank came about, and whether the rules favoured certain groups. The second part uses tax records to see whether certain groups were favoured in the enforcement of the law. In the extreme case of favouritism, the elite will be exempt from paying for the new bank and have all the control over it once it is established. However, favouritism can also take less extreme forms. All signs of the rules favouring certain groups, either by tax exemption or by receiving advantages in the bank, are signs of favouritism.

The institutional setting

In the Treaty of Kiel in January 1814, Denmark had to renounce Norway to Sweden. The treaty stated that Norway would be a separate state under the Swedish king. The Danish king did not settle with this and planned for a revolt in Norway. After advice from senior public officials, The Danish Crown prince, who had governed Norway, called for a constitutional assembly that would introduce democracy. The senior officials argued that if he resigned the sovereignty would be given to the Norwegian people and the Crown Prince was promised to be elected as the new king.²⁵⁷

Both for the constitutional assembly and the following parliament elections, men over the age of 25 that were either farmers owning land, public official or burgher had the right to vote. The constitutional assembly decided on an indirect electoral system, where the number of voters in a sub-parish determined the number of electors and the number of electors in a county decided the number parliament representatives the county would have. The cities and the surrounding counties had separate representatives.

Influence on the tax law and its interpretation

The debate on how to stabilize the economy and fund a central bank started already before the constitutional assembly in 1814. The debate reflected the classical opposites between the urban and rural areas, between the elite among the land owners and the merchants and between what can be called the middle class and the elite (Austnes 2014). Two proposals were made at the assembly. The first proposed that private individuals would fund a bank that was obliged to lend money to the government. It was seen as unlikely that the rich would

²⁵⁶ For an overview see Baland, Moene and Robinson (2010).

²⁵⁷ For an overview of the events and strategies, see Pryser (1999) pages 198-202.

invest in a bank that was obliged to lend to the government so the proposal was rejected. The second proposed to sell the public land that was at the public officials' disposal to fund a public bank. This would reduce the income of the public officials and was rejected by the senior officials that dominated the assembly (Austnes 2014). The assembly did not reach a conclusion and appointed a committee that would present a proposal at the first parliament.

The committee proposed that private individuals would buy stocks in the new bank paying with old bank notes and precious metal in a certain ratio. The catch was that the old bank notes would be made valueless by the end of the year so investing in the bank was the only way to get value of old bank notes. If only a few held precious metal, they would be able to speculate in people's need for precious metal to get value for their bank notes. The opposition argued that this was the case, and that the proposal would favour the elite in the cities that held precious metal greatly.

The parliament did not manage to reach an agreement on the matter. It was decided that a new committee would rewrite the proposal and that the new proposal only needed simple majority contrary to two thirds majority to pass (Lie et al., 2016). The bank ended up as an independent limited company funded by private individuals, but controlled by the parliament. The parliament would appoint the leadership of the bank and all changes in the activity had to be approved by the parliament (Rygg, 1918). The law established that the bank would be funded in two steps. First it would be attempted to raise the necessary funds through voluntary deposits like already established central banks (Johansen, 2006). If the necessary funds were not acquired within a certain time, the government would issue forced deposits according to people's wealth.

Whether the passed law favoured certain groups depended largely on whether it was possible to fund it through voluntary deposits. If it was funded through voluntary funds, the individuals investing in it chose to do so and the bank would still be controlled by the parliament. If the bank had to be funded by forced deposits, whether certain groups were favoured depends on how the forced deposits were assessed. The necessary funds were not obtained through voluntary deposits. The next section will investigate whether the parliament representatives used their power to benefit themselves and their constituency. Since the future returns from the deposits were very uncertain and they were involuntary, I will refer to them as a tax in following.

Data

The main dataset in the empirical analysis is the tax records from the funding of the bank in 1816. In addition, data on wealth held in land from tax records from 1802 are used in part of the analysis. Both sources are recorded at the individual level and are recently made available digitally.

Favouritism in the enforcement of the law

Even though the law stated that tax burdens were to be allocated according to wealth, individuals' wealth was not formally assessed. The tax burden would be distributed in three steps. First the parliament distributed the total tax burden across the 32 counties and cities. Then, in each county, an elected committee consisting of one man from each parish met and distributed the county's tax burden onto the parishes. Lastly, an elected committee met in each parish and distributed the tax burden on to individuals. I will in the following focus on the parliament representatives possibly favouring in the assessment of the tax.

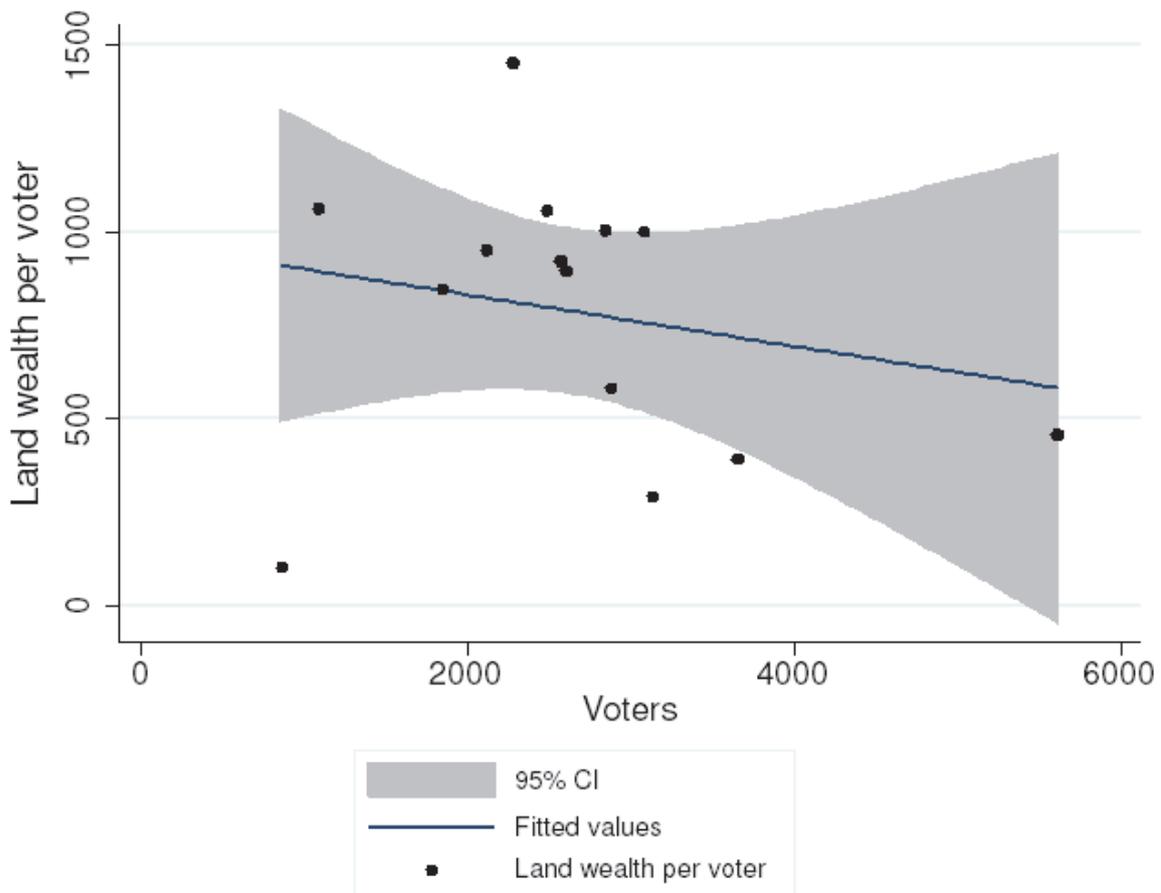
The parliament representatives could manipulate the assessment of the tax in all three steps of the distribution of the tax burden. The representatives have clear incentives to do this to reduce the tax burden placed on him, his acquaintances and his constituents.

If the allocation of the tax burden followed the law, the tax burden should only be associated with the constituencies' wealth not with the constituencies' representation in parliament. For the parliament representatives, reducing the tax burden for their constituency

would satisfy both reducing their own and their constituents’ potential tax. If the parliament representatives used their relative representation in the parliament to reduce the tax burden for their constituency, we would see a decrease in the tax burden when representation increases. If the parliament representatives were accountable for anyone, it was their constituents. In addition to the electorate being the ones the representatives had to answer to, the voting rules make the electorate the most probable taxpayers. For these reasons tax per voter will be used as the dependent variable. If the allocation is done according to the law, the magnitude of tax per voter should not be associated with representation in parliament.

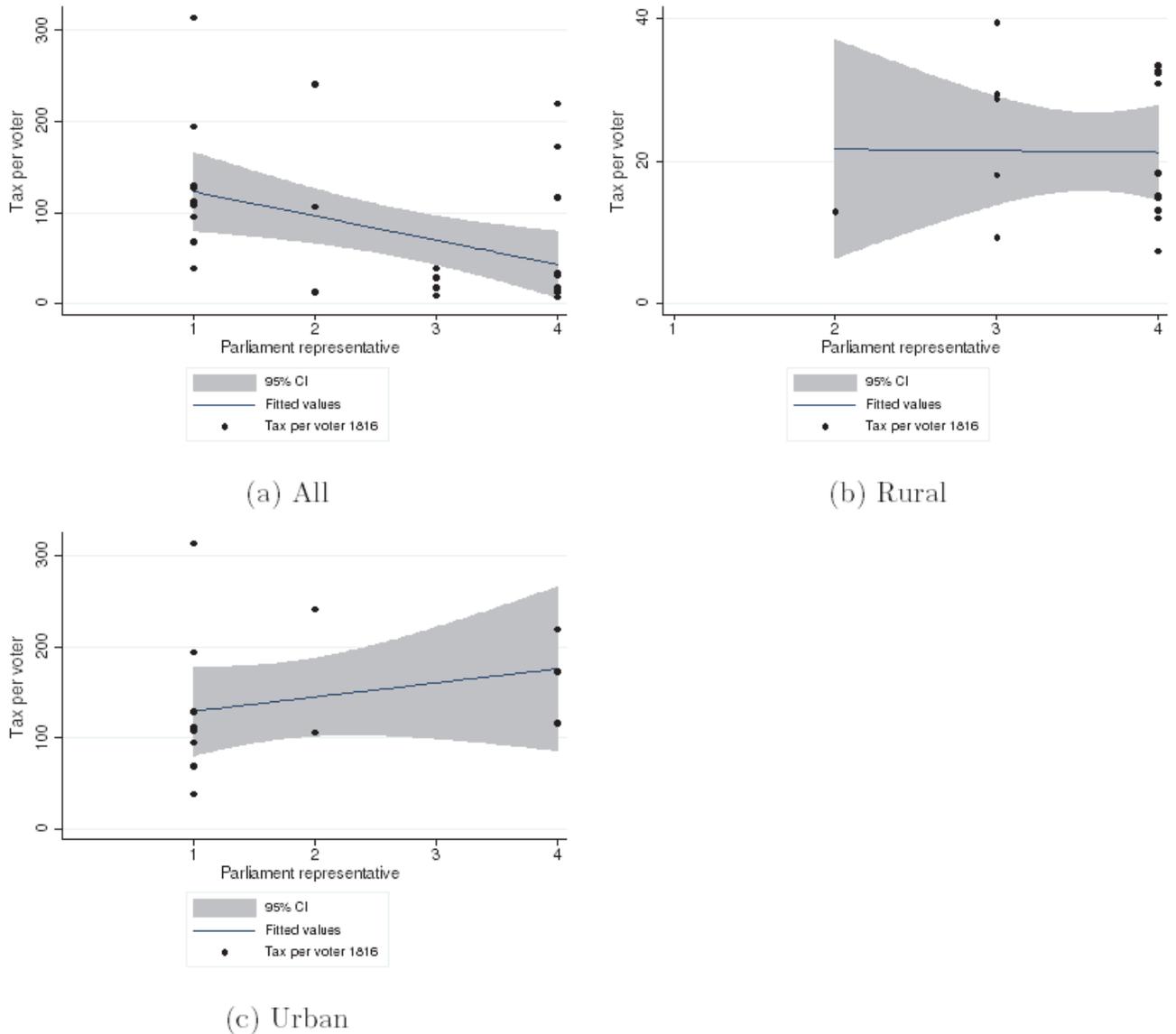
The electoral system creates a positive correlation between the number of voters and the number of parliament representatives in a county. This creates a potential bias when using tax per voter. If the tax is set according to wealth, tax per voter will be negatively correlated with the number of representatives unless the wealth increase proportionally or more with the number of voters. How wealth is related with the number of voters in the county is therefore important for the bias of the result. Using the wealth in 1802, a negative relationship between the number of voters and wealth per voter is found, as can be seen from figure 1. This indicates that there is a risk of overestimating the abuse of power by the political elite when using tax per voter as the dependent variable.

Figure 1: *The relationship between the number of voters and wealth in 1802 per voter in counties*



It is a sign of power abuse if the areas with more parliament representatives have lower tax per voter. Panel (a) in figure 2 suggests a negative relationship between the number of parliament representatives and the tax per voter assessed to a district, but there are multiple outliers from the trend. When looking at the counties and cities separately, panel (b) and (c), we see a clear difference both in the magnitude of tax per voter and its association with parliament representatives.

Figure 2: Relationship between tax per voter and number of parliament representatives in the constituencies



Let y be the tax per voter, r be the number of representatives, x be the control variables and i be the county:

$$\ln(y)_i = \alpha + \beta r_i + \mu x_i + \varepsilon_i \tag{1}$$

Then column 1 in table 1 presents the relationship depicted in panel (a) in figure 2. We can see that having an extra parliament representative is associated with a 45 per cent decrease in the tax per voter for a city or county. However, when whether a district is rural or urban is included in column 2, having an extra representative is no longer associated with lower tax. Instead, we see that being a city contrary to a rural county is associated with a tripling of tax per voter for a district. As there are reasons to believe the economy differed greatly between the cities and the country district, we need to control for this.

Table 1: *The relationship between number of representatives and tax per voter in the constituencies*

	(1)	(2)	(3)	(4)
	ln(Tax per voter)	ln(Tax per voter)	ln(Tax per voter)	ln(Tax per voter)
Representatives	-0,45*** (0,12)	0,11 (0,10)	0,11 (0,14)	0,22 (0,11)
Urban		2,08*** (0,26)		1,65*** (0,32)
1000 Voters			-0,58*** (0,11)	-0,23* (0,11)
_cons	5,05*** (0,37)	2,54*** (0,38)	4,58*** (0,29)	2,88*** (0,39)
<i>N</i>	32	32	32	32

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The thresholds for an extra elector or parliament representative and the way voters are allocated into sub-parishes can cause similar counties to end up with different representation in the parliament.²⁵⁸ And on the flip side, two different counties in terms of number of voters can end up with the same number of representatives. By controlling for the number of voters, this can be used to see if political power is used in the assessment of the tax. The number of voters is included alone in column 3 and together with whether the district is urban or rural in column 4 in table 1. An effect from the number of voters suggests that it is political power at the county level or variables correlated with this that has an effect on the tax. An effect from the representatives shows that the allocation of voters in to sub-parish matters and that the representatives used their power in parliament. Columns 3 and 4 show the same, the extra power gained by allocation into sub-parishes is not associated with lower tax. There is no sign of parliament representatives having abused their power in parliament to reduce their own and their constituency's potential tax burden.

The parliament representative was not supposed to be involved in the counties' distribution of the tax burden on the municipalities or the municipalities' distribution on individuals. However the parliament members can have interfered in the process. They are voted on by electors from the whole county and thereby the voters from the whole county. Still reducing the tax burden placed on their home municipalities would reduce the potential tax burden placed on them. It can be that the parliament representatives are from the wealthier municipalities. If this is the case, just seeing that the tax burden is not lower in the home municipalities of the representatives compared to the rest of the county would give a false verification of the absence of power abuse. To minimize this problem, I control for the wealth in the municipalities in 1802. Let y be the tax in 1816, r the number of parliament representatives, t the land wealth and j be the municipality:

$$\ln(y)_i = \alpha + \beta r_i + \mu \ln(t)_i + \varepsilon_i \quad (2)$$

Then we can see from column 1 in table 2 that the home municipalities of parliament representatives are not taxed less relative to other municipalities. If anything, the tax is higher in municipalities where parliament representatives live. This suggests that if the parliament representatives interfered in the county commission's work, they did not manage to minimize their own potential tax burden.

²⁵⁸ A simple example: two counties both consist of two sub-parish and have 200 voters each. In county A there are 100 voters in each sub-parish and the county will therefore have two electors, one from each sub-parish. In county B there are 102 voters in one sub-parish and 98 voters in the other sub-parish and the county will have 3 electors, two from the first and one from the second sub-parish.

Table 2: *The parliament representatives' interference in the county and municipality commissions*

	(1)	(2)	(3)
	ln(1816 tax)	Portion of taxpayers without representation	Portion of taxpayers without representation
Representatives	0.171* (0.0680)	-0.340** (0.117)	-0.101 (0.0881)
ln(land wealth)	0.660*** (0.0245)		0.105** (0.0353)
Constant	0.517 (0.271)	0.284*** (0.0523)	-0.912* (0.399)
Observations	320	240	205

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

If the parliament representatives were to interfere in the municipalities' commissions work, they would have conflicting interests. They would like to minimize their own tax burden, but not get unpopular among their voters by placing a high tax burden on them. A way to solve this would be to tax the people without the right to vote. Let v be the portion of taxpayers without representation, r the number of parliament representatives, x control variables and j the municipality:

$$\ln(v)_i = \alpha + \beta r_i + \mu x_i + \varepsilon_i \quad (3)$$

Column 2 of table 2 shows that the proportion of tax payers without the right to vote is lower in municipalities where a parliament representatives lives compared to other municipalities. This is the opposite effect of what would be expected if the parliament representatives interfered in the municipality commissions' work. A reason to place the tax burden on people without the right to vote can also be that there are not enough resources among the people with the right to vote. We have already seen results suggesting that municipalities where representatives live are taxed higher relative to others. When controlling for the land wealth in column 4, it is still fewer taxpayers without the right to vote in municipalities where it lives parliament representatives, but the result is no longer significant.

Conclusion

None of the findings in the paper suggest that the parliament representatives abused their power to benefit themselves. If the parliament representatives were more concerned about their self-interest than following the law, we would see a lower tax burden in the counties with high representation in parliament and municipalities where parliament representatives lived. This is not the case. Neither is it the case that more of the tax burden is placed on people without suffrage in home municipalities of parliament representatives. However, the paper does not state if the absence of the power abuse is due to noble-minded representatives or if the newly established institutions succeeded in constraining their power. Several of the proposals on how to fund the bank favoured certain groups. However, the diverse interests among the representatives in both the constitutional assembly and the first parliament stopped these proposals. The final law did not favour certain groups on paper and it might have been the rules for enforcement in combination with the geographical diversity in the parliament that constrained the parliament from favouritism in the enforcement.

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The migration of Flemish weavers to England in the fourteenth century: the economic influence and transfer of skills, 1331-81

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London and the Flemish exiles

At the start of the Hundred Years War, the Flemish count Louis of Nevers decided to honour his feudal obligations towards his suzerain, King Philip VI of France. His pro-French policy met with opposition from Flanders' politically powerful cities, whose all-important production of luxury cloth crucially depended on the import of high-quality English wool.²⁵⁹ In Ghent, the county's most prominent urban centre, the radical textile guilds led by James of Artevelde managed to gain control of the magistracy, after which similar regimes were installed in Bruges and Ypres. Together, the so-called Three Cities took over the government of the surrounding countryside and in 1339 they forced Louis of Nevers to leave the county. They forged an alliance with the English and, in 1340, recognized Edward III as suzerain and king of France. After 1345, however, following Artevelde's death and the absence of effective English support, the rebellious regime disintegrated and Nevers' son Louis of Male was able to gradually reconquer the county. In January 1349, a bloody battle in the streets of Ghent eliminated the last pockets of resistance.²⁶⁰

With the intention of bringing those who had disputed his father's authority to justice, the new Flemish count launched an investigation.²⁶¹ In England, Edward III anticipated the potential persecution of hundreds of skilled artisans who had been involved in the revolt. Already in May 1350, he issued letters of protection to those Flemings who, following the failure of the rebellion, had emigrated to London, Canterbury, Norwich, Salisbury, King's Lynn and other English cities and towns. Very similar to those granted to a number of French residents in England during the same years,²⁶² the documents qualified the Flemings as *incolae*, a term derived from Roman law to denote permanent inhabitants born outside the kingdom. As a reward for their loyalty during the Flemish conflict, they were allowed to live in the realm, to leave, enter and move around freely and to trade their goods. Officers were instructed to protect them against physical aggression and their property against confiscation.²⁶³

In October 1351, Louis of Male's inquiry was concluded and those who had compromised themselves during the years of rebellion were permanently exiled from Flemish soil. Lists of those banished in 1351 and of those eligible for pardon drawn up in 1359 make clear that at least 1,500 people, most of who came from Ghent, Bruges and the rural district of the Liberty of Bruges, were convicted. Confronted with the forced departure of such numbers

²⁵⁹ In Ghent, a city with about 64,000 inhabitants, the cloth industry provided work to over 13,000 people in 1357. David Nicholas, *Metamorphosis of a Medieval City: Ghent in the Age of the Arteveldes, 1302-1390* (Leyden, 1987), 19.

²⁶⁰ Henry Stephen Lucas, *The Low Countries and the Hundred Years' War : 1326-1347* (Ann Arbor, 1929), 257-267, 339-347, 358-374, 438-455, 480-492, 516-527, 559-564; David Nicholas, *The van Arteveldes of Ghent: the Varieties of Vendetta and the Hero in History* (Leyden, 1988), 19-71.

²⁶¹ *Cartulaire de Louis de Male, Comte de Flandre. Decreten van den Grave Lodewyck van Vlaenderen, 1348 à 1358*, ed. Thierry de Limburg Stirum (2 vols, Bruges, 1898), i, 78-79.

²⁶² Bart Lambert and W. Mark Ormrod, 'Friendly Foreigners: International Warfare, Resident Aliens and the Early History of Denization in England, c.1250-c.1400', *English Historical Review* cxxx (2015), 8-14.

²⁶³ The letters were not entered on the chancery's patent rolls but were recorded in an *inseximus* confirmation by London's court of husting in 1364. London Metropolitan Archives [hereafter cited as LMA], CLA/023/DW/93, n. 19. For the context of the confirmation, see *infra*.

of experienced cloth makers, Edward III proved even more determined to capitalize. On 25 September 1351, before the outcome of the investigation was made public, he issued new, more open-ended letters of protection, inviting all those who had been banished from Flanders and were willing to work to his kingdom.²⁶⁴

In spite of systematic evidence, it is hard to establish how many of those convicted accepted the offer and moved to England. In a recent study, Bart Lambert and I have demonstrated that in the fifteen years following the exile, 126 immigrants from the Low Countries settled with their wives and children in the middle-sized town of Colchester in the county of Essex, possibly adding about 10 per cent to its population. At least 30 of them figured on the lists of Flemish exiles in 1351. Most new arrivals were found working in the town's cloth production and the sale of textiles, which, during the same decades, grew exponentially. In the thirty years that followed, no signs of anti-alien hostility were recorded.²⁶⁵ It is hard to determine the exact number of Flemish immigrants who moved to England voluntarily or were forced to do so for political reasons. As can be seen, the number of Flemings that appear in English sources is a lot higher than of those whose names match the ones on the lists. On the other hand, in a recent article it has been shown that when it comes to sentencing to exile in fourteenth century Flanders, the count's chancery would usually make lists of the main instigators of rebellion, and their partisans would follow.

The only other place in England where Edward III's letters of protection are known to have had a considerable effect is London.²⁶⁶ The names of fifty-one exiles included in the 1351 lists of banishments match almost exactly with those of Flemish artisans who, according to the city's letter books, the memoranda and fine rolls, the aulnage accounts, and a variety of other sources, were dwelling in the capital during the twenty-five years following the investigation (see table 1). Whereas some of the exiles in Colchester, Great Yarmouth or York came from smaller Flemish towns and villages, all but two of those found in London originated from the large cities of Ghent, Bruges, and Ypres. In thirty-four of the fifty-one cases, the Flemish lists of exiles provide us with an occupation. Only one of them, carpenter John de Gaunt from Bruges, had no connection to the textile sector. John de Langford worked as a fuller; Lamsin Iperling was a shearer. The remaining thirty-one immigrants were all banished weavers. Many of the exiles in London had occupied key positions in Flanders during the years of the revolt. Levin Godhalse had served as alderman of Ghent in 1348.²⁶⁷ Giles Ripekast had been one of the city captains in Ghent,²⁶⁸ John de Cranburgh in Bruges.²⁶⁹ Lamsin de Vos was one of Bruges' most important drapers and had acted as dean of its weaver's guild in 1347.²⁷⁰ Exiles John Cockelar and Lamsin Iperling had sold large quantities

²⁶⁴ CPR, 1350-1354, 147; *Foedera, Conventiones, Literae et Cujuscunque Generis Acta Publica*, ed. Thomas Rymer (4 vols, London, 1816-1869), iii, 232.

²⁶⁵ Bart Lambert and Milan Pajic, 'Drapery in Exile: Edward III, Colchester and the Flemings, 1351-1367', *History* xcix (2014), 733-753.

²⁶⁶ One exile, Coppin Issac from Diksmuide, was admitted to the freedom of Lynn in 1351. *A Calendar of the Freeman of Lynn, 1292-1836, Compiled from the Records of the Corporation of the Borough by Permission of the Town Clerk* (Norwich, 1913), 12. Banished Flemish weaver Lawrence Conync became a freeman of York in 1354. Francis Collins, ed., *Register of the Freeman of the City of York: Vol. I, 1272-1558*, Surtees Society no. 96 (Durham, 1897), 48. Another exile, Jan van Oostborch, was pardoned for the murder of a Brabanter in Norwich in 1355. CPR, 1354-1358, 284.

²⁶⁷ Napoleon De Pauw and Julius Vuylsteke, eds., *De Rekeningen der stad Gent: tijdvak van Jacob van Artevelde 1336-1349, Volume 3* (Ghent, 1885), 273.

²⁶⁸ Ripekast was one of the few who returned to Flanders after being pardoned in 1359. Paul Rogghé, "Gemeente ende Vrient: Nationale Omwentelingen in de XIVde eeuw," *Annales de la Société d'Emulation de Bruges* 89, no. 3-4 (1952) : 101-135, at 125.

²⁶⁹ Expenses for Cloth and Lining, 1343-4, City Accounts, 1343-4, fol. 56 r., Bruges City Archives.

²⁷⁰ As Ripekast, de Vos returned after 1359. Georges Espinas and Henri Pirenne, eds., *Recueil de documents relatifs à l'histoire de l'industrie drapière en Flandre : volume 2* (Brussels, 1906), 576 ; James M. Murray, *Bruges, Cradle of Capitalism, 1280-1390* (Cambridge, 2005), 287, 292.

of cloth and fabric for linings to the Bruges city government throughout the 1340s.²⁷¹ Unlike Colchester, London attracted the top layer of Flanders' reputed textile industry. Their prominent roles during the years of the rebellion had cost them most of their political leverage, but they brought economic and social capital with them to England.

Only very exceptionally do the London sources allow us to establish whether the Flemish exiles were accompanied by their wives and children. In 1353, Lamsin Iperling was sued before the Court of Common Pleas together with his spouse Agnes for breaking into a house near the Tower.²⁷² Only one exile, John Marchaunt of Ypres, figures on the 1351 lists with his wife. It does not necessarily follow that the others immigrated alone, as the case of Henry Clofhamer shows. Clofhamer, banished from Ghent, appears repeatedly in the London sources throughout the 1350s and 1360s.²⁷³ In 1359, his anonymous wife, who had never been mentioned before, was pardoned and recalled to Flanders,²⁷⁴ which implies she had been in England during the previous years. Some of the exiles, such as John and William Brunhals from Ghent or Jacob and John van Loo from Bruges, bear the same surnames and may have been related to each other. The banished Flemings in London still maintained contact with friends and relatives on the other side of the Channel as well. According to a verdict by the Ghent bench of aldermen, for example, John van Wetere received annual visits from Ghent money changer Feyns de Backer in his house in the English capital at the end of the 1350s.²⁷⁵

The aulnage accounts, which record the payment of a fee for the measurement and sealing of woollen cloth, make clear that the Flemings in London focused on the production of rays, medium-quality fabrics with striped bands or checks, and coloureds, the most expensive, heavily finished kind of cloth.²⁷⁶ In 1374-77, the only years for which particulars of account have survived for the capital, the separate membranes devoted to these types of textiles contain almost exclusively names of Flemish artisans.²⁷⁷ Eight of them were people exiled from Flanders in 1351. John van Dorme, from Ypres, brought eight short ray cloths and two scarlets, the most exquisite kind of woollen dyed with kermes, to the aulnager on 13 December 1374. On 28 September 1376 he did the same with nine short rays, on 17 February 1377 he had another three rayed cloths sealed.²⁷⁸ John Capelle, an exile from Ghent, paid the fee for six short rays on 12 October 1374 and another 18 rayed cloths six days later.²⁷⁹ John van Loo took 14 pieces of rayed cloth to the aulnager on 2 October 1376.²⁸⁰

It looks as if the Flemish arrivals in London operated their business on the same capitalist basis as they used to do in their home county.²⁸¹ Five of the exiles are referred to in the London sources as either merchants or merchant-drapers. Three acquired citizenship, which, according to London's charter granted by Edward II in 1319, was required in order to

²⁷¹ Expenses for Cloth and Lining, 1343-4, 1344-5, City Accounts, 1343-4, fols. 56 v., 58 v., 61 v; 1344-5, fols. 58 r., 63 r., Bruges City Archives.

²⁷² Verdict Court of Common Pleas, 1353, CP 76, m. 15, LMA.

²⁷³ Verdict Court of Exchequer, 1352, E 13/76, mm. 97-98d, TNA; *CPMR*, 2: 65-6.

²⁷⁴ De Pauw, *Cartulaire des Artevelde*, 715.

²⁷⁵ Verdict Aldermen of the Keure, 18 January 1360, Series 301: Registers of the Keure, volume 1, 1360-1, fol. 64 r, Ghent City Archives.

²⁷⁶ For the different ranges of cloth on the London market, see John R. Oldland, *London Clothmaking, c.1270-c.1550* (London, 2003), 24-25, 59-60.

²⁷⁷ TNA, E 101/340/ 22, m. 3; E 101/340/23, mm. 5, 5d. The only known Englishman to have rays or coloureds aulnaged during between 1374 and 1376 was weaver John Bures, on 12 August 1374.

²⁷⁸ TNA, E 101/340/ 22, m. 3; E 101/340/23, mm. 5, 5d.

²⁷⁹ TNA, E 101/340/ 22, m. 3.

²⁸⁰ E 101/340/23, m. 5.

²⁸¹ For the organization of the Flemish cloth industry, see John Munro, 'Industrial Entrepreneurship in the Late-Medieval Low Countries: Urban Draperies, Fullers, and the Art of Survival', in *Entrepreneurship and the Transformation of the Economy (10th - 20th Centuries)*, ed. Paul Klep and Eddy Van Cauwenberghe (Leuven, 1994), 383-384; Peter Stabel, 'Guilds in Late Medieval Flanders: Myths and Realities of Guild Life in an Export-Oriented Environment', *Journal of Medieval History* xxx (2004), 208-209.

trade retail in the city.²⁸² The amounts of cloth the Flemings aulnaged are consistently very high and exceed the capacities of individual artisans. By contrast, the other types of woollens recorded in 1374-77 were invariably brought to the aulnager by high numbers of English fullers in much smaller quantities.²⁸³ Some of the immigrants probably possessed the capital to organize the whole production process and subcontracted stages of the work to their fellow-Flemings or their families. Given the presence of only one fuller and the absence of dyers among the exiles, they must have entrusted the finishing stages to local workers, whilst marketing the finished product themselves.

The fortunes of London's native weavers contrasted sharply with those of the Flemish exiles. During the second quarter of the fourteenth century, the English cloth workers had experienced a revival as they had been able to extricate themselves from the dominance of the burellers and technological advancement had enabled them to broaden their range from semi-worsted to cheap, coarse full woollens. The Black Death did reduce the demand for lower-quality cloth, however, be it not as much as the drop in the population figures would suggest. In 1364, the native weavers were also denied the sale of their own products, as only drapers now had the right to market cloth in the city. This did not automatically mean the latter would buy from local cloth workers. In 1351, London's exemption from the statute of York had been lifted, allowing provincial weavers, who were able to work against lower costs, to flood the city with their less expensive textiles. While London developed into the kingdom's most important cloth market, its native cloth workers became uncompetitive. Many moved out of the city to escape payment of the farm to the crown. Their political weight in London's decision-making bodies, such as the common council, was limited.²⁸⁴

Switching to the types of cloth the Flemings' were specialized in, where demand was sufficient and provincial competition less fierce, could have solved part of the native weavers' problems, but they were unable to do so. The production of rayed cloth required specialist weaving and shearing skills,²⁸⁵ which they did not have. Making coloureds demanded even more specific know-how, mostly in the preparation of the yarn, which, during this period, no English producer had.²⁸⁶ The natives' lack of capital and control over the complete production cycle also prevented them from following up on the tastes of the end customers who specified the colours and other specifications of the rays and from imposing the very high quality standards needed for manufacturing coloured cloth. This probably explains at least partly why the London weavers pursued the supervision of the guild of alien cloth workers with such desperation: with the Flemings' incorporation came their expertise, their capital and their unique selling proposition. The Flemish weavers might already have refused to hire English apprentices and servants in order to avoid the dissemination of their skills, as they would do in the late fifteenth century.²⁸⁷

When, in a petition to the king in 1376, the native weavers deplored that the 'Flemings, Brabanters and other aliens have at present, and for a long time have had, the great part of the said mystery',²⁸⁸ they were, thus, not so much targeting a group of competing artisans who had conquered their segment of the market. Their desperation rather resulted from trends in the clothmaking business in London after the middle of the fourteenth century, which had turned out to be very detrimental to them. The incorporation of a group of exiled immigrant workers, who had fared much better, could give them access to new parts of the

²⁸² *The Historical Charters and Constitutional Documents of the City of London* (London, 1887), 47.

²⁸³ Oldland, *London Clothmaking*, 85.

²⁸⁴ Oldland, *London Clothmaking*, 67-78; Oldland, 'Making and Marketing Woollen Cloth', 95-96; Eleanor Quinton, *The Drapers and the Drapery Trade of Late Medieval London, c.1300-c.1500* (London, 2001), 113-117.

²⁸⁵ John Munro, 'Medieval Woollens, Textiles, Technology, and Organisation', in: *The Cambridge History of Western Textiles*, ed. David Jenkins (Cambridge, 2003), 183, 211.

²⁸⁶ Oldland, *London Clothmaking*, 62-63.

²⁸⁷ John R. Oldland, 'London's Trade in the Time of Richard III', *The Ricardian* xxiv (2014), 16.

²⁸⁸ TNA, SC 8/43/2127.

market and ameliorate their problems with the payment of the farm. To do so, they needed the support of Edward III. Yet the English king, who oracled to work for the common profit of his entire realm, continued to ignore what they were entitled to by privilege and preferred to court the Flemings.

‘She came not to her to be beaten, nor to be her drudge and she wolde not tarye long’: Evidence of female servant mobility and movement from the church courts of south-west England, 1550-1650

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In 1568, Joanne Large of Rockbeare in Devon came before the church court of the diocese of Exeter and deposed what she knew of Isott Riches, a pregnant servant who had recently left the parish. She deposed that Isott told her that ‘her Mres [mistress] had betten her ones [once] or twice but Isott told her not for what cause or upon what occasion, sayng that she came not to be beaten, nor to be her drudge and that she wolde not tarye long’.²⁸⁹

Isott’s declaration that ‘she wolde not tarye long’ with her employer raises several questions about patterns of service for women in early modern England. How much agency did female servants have in determining the conditions of their own employment? How often did they move between employers? How far did they travel from home in search of employment? How did they find work? What economic patterns affected their employment?

Using evidence from church court depositions of the dioceses of Exeter and Gloucester, this paper shows that female servants exhibited a more mixed pattern of mobility and employment than scholarship suggests, indicating that the controls placed over them by the labour laws were not always enforced.

Servant mobility and patterns of employment – what do we know?

In 1563, the Statute of Artificers laid out an agenda for regulating the employment of the young. Revising existing labour laws dating from as early as 1349, the statute set maximum local wage rates and established uniform conditions of employment.²⁹⁰ Primarily, it made service a compulsory form of employment for all unmarried men and women below the age of 60. The legislation therefore not only pursued the regulation of employment; targeted at the ‘masterless young’, the statute can only be understood within a context of fears of vagrant youth. The legislation was a means of social control through the authority of a master, with the promotion of good discipline and morality at its heart.²⁹¹ The statute stated that:

Every person between the age of Twelve yeres and the age of Threescore yeres, not beinge lafullie reteyned, nor [an] apprentice [...] nor beinge reteyned by the yere or half the yere at the leaste [...] be compelled to serve.²⁹²

Servants were expected to remain with their employers for a minimum of half a year, with annual contracts preferable. Mirroring the preoccupations of earlier legislation, the 1563 statute also attempted to regulate labour mobility, specifying that servants were only permitted to leave the parish if they held a testimonial letter ‘under the Seale of the [...] Constable’ and ‘twoo other honest house holders’.²⁹³

²⁸⁹ Devon Heritage Centre, Chanter 858, Case 1132, John Roo v Frances Yarde (1568).

²⁹⁰ For earlier labour laws, see, for example, the 1349 Ordinance of Labourers, printed in P. A. Brown, R. H. Tawney, and A. E. Bland (eds.), *English Economic History: Select Documents* (London: Bell, 1920), pp.164-167. The agenda laid out in the 1349 ordinance was consolidated in the 1351 Statute of Labourers (see R. B. Dobson, *The Peasants’ Revolt of 1381* (London: Macmillan, 1970), pp.63-68.)

²⁹¹ See Paul Griffiths, *Youth and Authority: Formative Experiences in England, 1560-1640* (Oxford: Oxford University Press, 1996), pp.351-389, esp. p.356.

²⁹² R. H. Tawney and Eileen Power (eds.), *Tudor Economic Documents: Being Select Documents Illustrating the Economic and Social History of Tudor England* (London: Longmans, Green, 1951), pp.340-341.

²⁹³ *Ibid.*, p.341.

The extent to which the labour laws were enforced in early modern England has been the subject of some scrutiny, with a particular focus on Quarter Sessions evidence from Norfolk. Jane Whittle's study of surviving warrants connected with the enforcement of the labour laws in the county between 1532 and 1572, shows that almost half related to compulsory service.²⁹⁴ She notes an increase in the number of prosecutions in the years immediately before the introduction of the Statute of Artificers, indicating the climate in which this legislation was introduced.²⁹⁵ Tim Wales adds that those who remained within the family home also frequently faced prosecution in later seventeenth-century Norfolk.²⁹⁶ Furthermore, Paul Griffiths' study of young people in Norwich pinpoints a peak in civic anxieties towards those living outside of service at the turn of the seventeenth century.²⁹⁷ Bernard Capp suggests that elsewhere in England the enforcement of the statute was patchy. He notes that while Quarter Sessions records of North Yorkshire document numerous breaches of the Act by young people and employers alike, 'such zeal is rarely found elsewhere'.²⁹⁸

Sources

Enforcement of the labour legislation is therefore well documented in Quarter Sessions records. However, this type of evidence represents only those apprehended for avoiding employment in service and it is difficult to ascertain how effective the legislation was in controlling labour mobility and hiring patterns. As Griffiths notes, court records typically document evidence of dissent and 'conformity and orthodoxy can appear remote'.²⁹⁹

However, patterns of female servant employment can be identified using church court depositions, which recorded the parish of residence and place of birth of each witness appearing before the court. Alongside this detailed evidence of mobility, contextual or incidental evidence of conditions of service are also recorded, including the length of time a woman remained with a particular employer and the time of year that her contract commenced.

Servant mobility in early modern England

Peter Laslett's pioneering work on mobility demonstrates the high population turnover of early modern parishes and presents servants as the most mobile occupational group.³⁰⁰ Given that the Statute of Artificers aimed to reduce labour mobility, this is perhaps surprising. Laslett's findings are supported by evidence found in the church court depositions of the dioceses of Exeter and Gloucester: table 1 shows that mobility of female servants was higher in both dioceses than the mobility of men and women more generally.

²⁹⁴ Jane Whittle, *The Development of Agrarian Capitalism: Land and Labour in Norfolk, 1440-1580* (Oxford: Oxford University Press, 2000), p.281.

²⁹⁵ *Ibid.*, pp.259-260, 277-287.

²⁹⁶ Tim Wales, "'Living at their own Hands": Policing Poor Households and the Young in Early Modern Rural England', *Agricultural History Review*, 61 (2013), 31.

²⁹⁷ Griffiths, *Youth and Authority*, pp.382-384.

²⁹⁸ Bernard Capp, *When Gossips Meet: Women, Family, and Neighbourhood in Early Modern England* (Oxford: Oxford University Press, 2003), pp.131-132.

²⁹⁹ Griffiths, *Youth and Authority*, p.395.

³⁰⁰ Peter Laslett, *Family Life and Illicit Love in Earlier Generations: Essays in Historical Sociology* (Cambridge: Cambridge University Press, 1977), pp.65-67.

Table 1: *Mobility of witnesses recorded in the depositions of the dioceses of Gloucester and Exeter, 1550-1650*

	Diocese of Gloucester					Diocese of Exeter				
	Stationary		Moved		Total	Stationary		Moved		Total
	N	%	N	%		N	%	N	%	
Male	2458	50.7	2390	49.3	4848	2054	42.8	2744	57.2	4798
Female	398	38.8	629	61.2	1027	298	36.9	510	63.1	808
Total	2856		3019		5875	2352		3254		5606
Female servant	18	12.9	121	87.1	139	23	30.3	53	69.7	76

Sources: Gloucester Archives, GDR deposition books and Devon Heritage Centre, Chanter deposition books.

While Ann Kusmaul also confirms this mobility in her analysis of eighteenth-century settlement examinations, she notes that servants rarely travelled more than 15 kilometres from their place of birth.³⁰¹ Whittle found the same pattern of mobility for sixteenth-century Norfolk servants.³⁰² To return to the case of Isott Riches outlined at the beginning of this paper, her experiences of service represent a different pattern of mobility. Witnesses deposed that although Isott was employed in the vicarage house of the parish of Rockbeare, she was not from Rockbeare but came from Torbyran, a parish some 34 kilometres away. Isott's former master, John Brook deposed that two years before his examination in the court, Isott had come to Staverton, a parish adjacent to Torbryan. She offered her service to his wife, Katherine, subsequently travelling with them to work in their Rockbeare home. Her movement did not end here; the deposition of John Brooke further noted that upon discovery of her illegitimate pregnancy, Isott was conveyed out of Rockbeare to one 'Clapham's house in Kilmington', 24 kilometres east of Rockbeare and nearly 55 kilometres away from Torbryan, Isott's starting point.³⁰³ Isott's mobility was therefore more extensive than the patterns found by Kusmaul in the eighteenth century and Whittle in sixteenth-century Norfolk.

The distances that Isott travelled were not necessarily atypical. Table 2 shows that 43.5 per cent of female servants across the two dioceses travelled less than 15 kilometres from either their parish of birth or previous residence. Over half had travelled further, with the highest proportion travelling between 15 and 25 kilometres. This range represents roughly 'a day's walk', a distance which Jeremy Goldberg suggests was typical for late medieval servants.³⁰⁴ The fears of vagrancy that underpinned the Statute of Artificers did not preclude female servants from migrating to other parishes in search of work.

³⁰¹ Ann Kusmaul, *Servants in Husbandry in Early Modern England* (Cambridge: Cambridge University Press, 1981), p.52.

³⁰² Whittle, *Development of Agrarian Capitalism*, p.273.

³⁰³ DHC, Chanter 858, Case 1132, John Roo v Frances Yarde (1568).

³⁰⁴ P. J. P. Goldberg, *Women, Work and Life Cycle in a Medieval Economy: Women in York and Yorkshire c.1300-1520* (Oxford: Oxford University Press, 1992), p.282.

Table 2: Distances travelled by female servants in the dioceses of Gloucester and Exeter, 1550-1650

Distance (km)	Diocese of Gloucester		Diocese of Exeter		Total	
	N	%	N	%	N	%
> 0 and < 5	9	13.0	1	7.1	10	12.1
≥ 5 and < 10	11	15.9	1	7.1	12	14.5
≥ 10 and < 15	12	17.4	2	14.3	14	16.9
≥ 15 and < 25	16	23.2	4	28.6	20	24.1
≥ 25 and < 35	10	14.5	2	14.3	12	14.5
≥ 35 and < 50	5	7.3	3	21.4	8	9.6
≥ 50	6	8.7	1	7.1	7	8.4
<i>Total</i>	69		14		83	

Sources: As in table 1.

Hiring patterns

The Statute of Artificers permitted a minimum period of six months in service but most strongly advocated annual contracts. Kussmaul shows that 75.8 per cent of (mostly male) servants in the eighteenth century spent exactly a year in the continuous employment of a particular master.³⁰⁵ She connects this annual pattern of hiring with regional agricultural requirements, noting that contracts ending in Michaelmas were a phenomenon of areas of arable farming that required seasonal labour. Pastoral farming, on the other hand, required care of animals all year round.³⁰⁶ She found that over 90 per cent of hiring took place around the religious festivals of Michaelmas (29 September) and Martinmas (11 November), the former representing hiring patterns of the south and east of England and the latter determining hiring patterns in the north.³⁰⁷ Simon Penn and Christopher Dyer also found that late medieval servants started annual contracts at Michaelmas or Martinmas and Michael Roberts adds that annual contracts of service were ‘orientated by the year of church festivals, itself rooted in the seasonal rhythms of the farming year’.³⁰⁸

Servant hiring in early modern England is therefore often characterized as a seasonal, agricultural phenomenon. Penn and Dyer note that the uniformity of late medieval servant hiring patterns implies ‘some machinery for bringing masters and servants together’, such as hiring fairs. Continuity between late medieval and nineteenth-century hiring might be suggested: Kussmaul notes that hiring fairs were important sites of employment throughout the long eighteenth century.³⁰⁹ Roberts suggests that statute sessions, the administrative machinery designed to enforce the labour laws, developed labour markets that provided service with an institutional framework: those who were not in service could find employment at these sessions.³¹⁰ The labour legislation is therefore presented as determining and controlling patterns of hiring. However, Whittle’s study of service in sixteenth-century Marsham in Norfolk shows that while the county’s arable economy might have lent itself to a Michaelmas hiring pattern, servants were hired irregularly throughout the year.³¹¹ She argues

³⁰⁵ Kussmaul, *Servants in Husbandry*, p.52.

³⁰⁶ *Ibid.*, p.97; Whittle, *Development of Agrarian Capitalism*, p.256.

³⁰⁷ Only in Lincolnshire was a different pattern found, with many servants in husbandry hired on May Day. Kussmaul, *Servants in Husbandry*, pp.50-51.

³⁰⁸ Simon Penn and Christopher Dyer, ‘Wages and Earnings in Late Medieval England: Evidence from the Enforcement of the Labour Laws’, *The Economic History Review*, 43 (1990), 365; Michael Roberts, ‘“Waiting upon Chance”: English Hiring Fairs and their Meanings from the Fourteenth to the Twentieth century’, *Journal of Historical Sociology*, 1 (1988), 124.

³⁰⁹ Penn and Dyer, ‘Wages and Earnings in Late Medieval England’, 365; Kussmaul, *Servants in Husbandry*, pp.59-61.

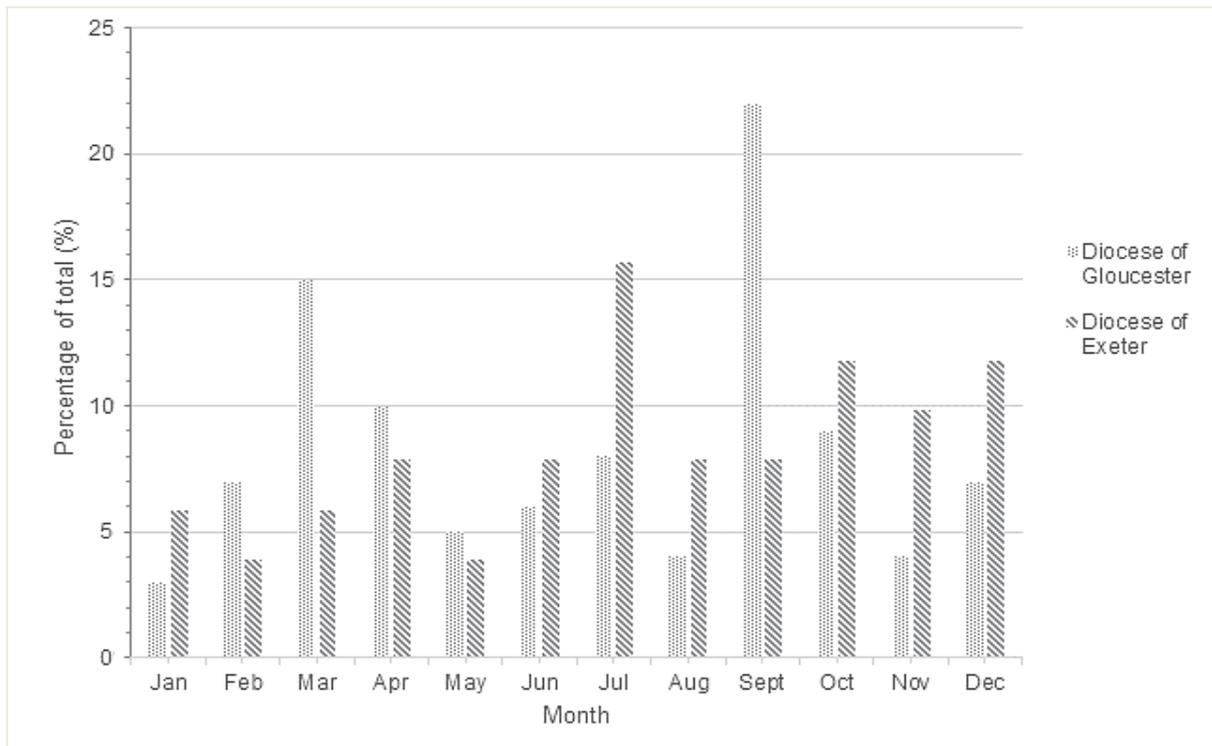
³¹⁰ Roberts, ‘“Waiting upon Chance”’, 124, 130.

³¹¹ Whittle, *Development of Agrarian Capitalism*, p.272.

that there is no evidence that the petty sessions (as the statute sessions came to be known) operated as hiring fairs during this period; this was a later phenomenon.³¹²

Mirroring Whittle's findings, patterns of hiring were neither seasonal nor regular in the South-West of England between 1550 and 1650. Figure 1 shows the estimated month in which female servants were hired, based on their descriptions of how long they had been in service at the time of their court examinations. It shows that while Michaelmas hiring was more commonplace in the diocese of Gloucester, it does not adequately represent all patterns of female servant hiring. Patterns were even more irregular in the diocese of Exeter, the data showing that there was no particularly common period of servant hiring.

Figure 1: *Estimated monthly hiring patterns of female servants recorded in the church court depositions of the dioceses of Gloucester and Exeter, 1550-1650*



Note: Calculations have been possible for 100 female servant hirings in the diocese of Gloucester compared to 51 female servant hirings in the diocese of Exeter. Each instance of hiring has therefore been represented as a proportion of the total number of hirings for each diocese in order to make the data comparable.

Sources: As in table 1.

Annual patterns of service also fail to account for the majority of experiences for most women across both dioceses. Table 3 shows that between a third and 40 per cent of female servants were employed for less than a year, indicating that the Statute of Artificers' endorsement of an annual contract of service was not typically followed nor enforced. Alice Mathewe of Cheltenham deposed in 1611 that 'aboute the beginning of Aprill last past Thomas Mathewes [...] did hire this deponent to be his servant until Michaelmas the next cominge', but remained in his service for just one week.³¹³ In October 1604, Elizabeth Greene was recorded as a servant in John Sheile's house in Gloucester and deposed that 'she doth worke taske worke with John Sheile in his house in bargaine by the weeke tell [till] Christmas next': her weekly-negotiated contract lasted just three months.³¹⁴

³¹² Jane Whittle, 'A Different Pattern of Employment: Servants in Rural England c.1500-1660', in Jane Whittle (ed.), *Servants in Europe, c.1400-1900* (Woodbridge: Boydell and Brewer, forthcoming).

³¹³ Gloucester Archives, GDR/114, Case 860, Elizabeth Mathewes v Thomas Mathewes (1611). Italics my own.

³¹⁴ GA, GDR/95, Case 701, Sheile v Thomas Bishop (1604).

Table 3: *Number of years of continuous employment within a household recorded for female servants in the church courts of the dioceses of Gloucester and Exeter, 1550-1650*

Length of service (years)	Diocese of Gloucester		Diocese of Exeter	
	N	%	N	%
< 1	38	33.3	34	40.0
≥ 1 and < 2	29	25.4	14	16.5
≥ 2 and < 3	16	14.0	12	14.1
≥ 3 and < 4	8	7.0	5	5.9
≥ 4 and < 5	4	3.5	6	7.1
≥ 5 and < 6	4	3.5	2	2.4
≥ 6	15	13.2	12	14.1
<i>Total</i>	<i>114</i>		<i>85</i>	
<i>Mean length of service</i>		<i>2.68</i>		<i>2.81</i>

Sources: As in table 1.

Implications and conclusions

In 1607, servant Joanne Daingerfield of Uley in Gloucestershire was described by witnesses as ‘a poore lame gerle [who] hath no certen habitacion or dwelling but goeth from one to an other to gett worke’, and that she ‘stragleth upp and downe to gett worke’.³¹⁵ While the witnesses sought to stress her vagrancy to undermine her deposition, servant movement between parishes was commonplace. A memorandum issued in 1572 complained that many employers hired servants without asking for testimonial letters from their previous place of residence, indicating that they may have been infrequently issued and therefore scarcely deemed important.³¹⁶ The data presented in this paper show that young women frequently moved around their counties, sometimes travelling as far as 50 kilometres. Many women also migrated to urban centres in search of work, as studies of London service show and the data from this study also indicate.³¹⁷

Other patterns of employment exhibited by female servants across the South-West of England indicate that the Statute of Artificers had little bearing. How long a woman remained in the service of an employer or the time of the year at which she was hired was determined by the needs of the individual servant and her employer. Service was more flexible than the Statute of Artificers suggests, with women travelling various distances, employed throughout the year and for different lengths of time.

³¹⁵ GA, GDR/100, Case 619, *George Birche v Thomas Payne* (1607).

³¹⁶ Proposals for the Better Administration of the Statute of Artificers (1572) in Brown, Tawney, and Bland (eds.), *English Economic History* (London: Bell, 1920), pp.333-336. See also, Capp, *When Gossips Meet*, pp.131-132.

³¹⁷ See Laura Gowing, *Domestic Dangers: Women, Words and Sex in Early Modern London* (Oxford: Oxford University Press, 1996), pp.18-20; Roger Finlay, *Population and Metropolis: the Demography of London, 1580-1650* (Cambridge: Cambridge University Press, 1981), p.140; Vivien Brodsky Elliot, ‘Single Women in the London Marriage Market: Age, Status and Mobility, 1598—1619’, in R.B. Outhwaite (ed.), *Marriage and Society: Studies in the Social History of Marriage* (London: Europa, 1981), p.88.

Constructing equality? Women's wages for physical labour, 1550-1759

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Recent research has challenged assumptions about early modern women, showing that unskilled women participated in the extra-household paid labour market in similar ways to unskilled men by patching together a full-year's work schedule from short-term jobs as they became available (Humphries & Sarasua 2012). But there remain many unanswered questions about the extent of women's participation in physical labour, such as construction work, and about how women were paid, especially relative to men.

This paper uses new data from archival sources at both aggregate and individual levels on the wages of women and men engaged in unskilled construction work in Sweden 1550-1750, showing that women were active participants in construction work. Findings also challenge theories about what factors influence women's wages – women may have been hired secondarily to men, but did not appear to systematically receive lower wages based on discrimination or productivity differences.

This work further complements theories which connect women's work only to women's labour supply, which is assumed to change dramatically after marriage and childbirth. Although this paper does not present direct evidence about women's labour supply, it shows that the feminization of the labour force and women's wages are positively connected with construction labour demand.

Data and methodology

The primary data are daily wages for unskilled construction workers collected from payment records from city, church, and manorial archives in modern day Sweden, predominantly from Malmö, Kalmar, and Stockholm.

Women are less frequently represented than men. Men are paid for over 68,400 days of work 1550-1759; in the same period women are paid for 8,530. Published annual wages for men and women in Stockholm 1600-1719 (Jansson, Andersson Palm, and Söderberg 1991) are incorporated into the series, as are data from Johan Söderberg's personal archival notes.

Annual daily wages are calculated as the unweighted mean of daily payments. Each individual payment is given equal weight. When necessary, data are separated into skilled and unskilled work using the HISCO and HISCLASS systems (van Leeuwen et al. 2002; van Leeuwen and Maas 2011).

Women's relative wages are computed by dividing women's unskilled daily wages by men's. A value of one indicates men and women earned the same daily wage: 0.8 indicates women earned 80 per cent of what men did. Relative wages are computed locally to avoid regional price effects; the unweighted average is taken across regions.

The gender pay gap: discrimination, or market forces?

Despite recent strides in documenting women's paid work in the historical record (c.f. Humphries and Weisdorf 2015) the reasons why women's and men's pay are different often remain unclear.

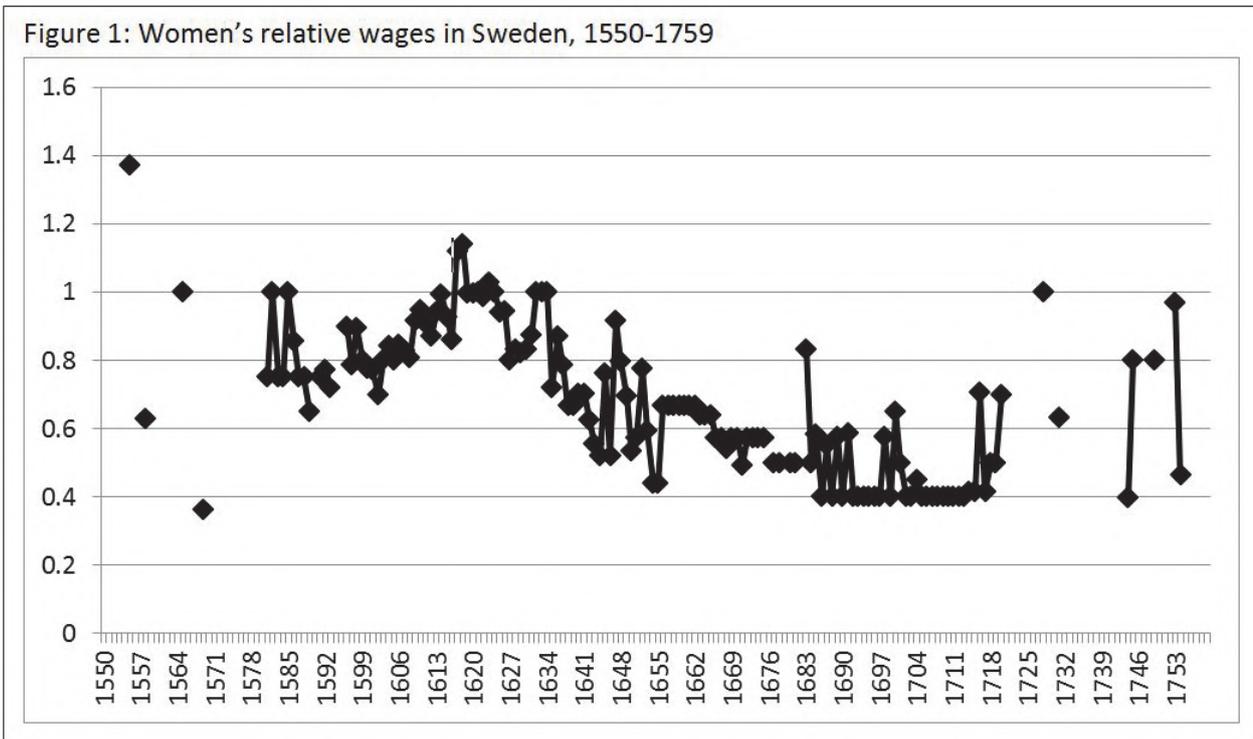
The debate centres on whether women were paid less because they were less efficient than men or if women were paid less because they were discriminated against on the basis of sex. Because women have less physical strength than men they can be less efficient in strength-based jobs, such as construction. If women are less productive over the same time period, a lower wage for one day's labour can still reflect equal wages for relative productivity and is economically efficient (Burnette 2008). Alternatively, women could be

sorted into poorer-paying tasks or sectors solely based on sex, even when labour was lacking for higher-paying ‘male’ occupations and sorting was not an economically efficient response (Bardsley 1999). This argument counters a third literature that describes the post-Black Death period as a ‘Golden Age’ for unskilled women in particular, with the expectation that they gained even higher bargaining power than men due to labour shortages. Women lost this advantage, and their higher wages, with demographic recovery (van Zanden 2011).

This paper finds little evidence for productivity-determined wages, or for systematic sorting or discrimination within unskilled work. Instead I find that while women were probably not the preferred construction workers, they were thoroughly integrated and wielded considerable bargaining power in periods of high labour demand, which were characterized by both high wages and feminized labour forces. Both women’s relative wages and participation fell during lower work periods, similar to the partial agency post-plague.

Women’s relative wages in Sweden

Sweden in the early modern period was backward and agricultural – much like Eastern and Central Europe at large. City growth was slow, with an urban population of only 10 per cent in 1850, and industrialization beginning only at the end of the nineteenth century (Andersson-Palm 2000), which meant there were no major changes in the labour market regime during this period.



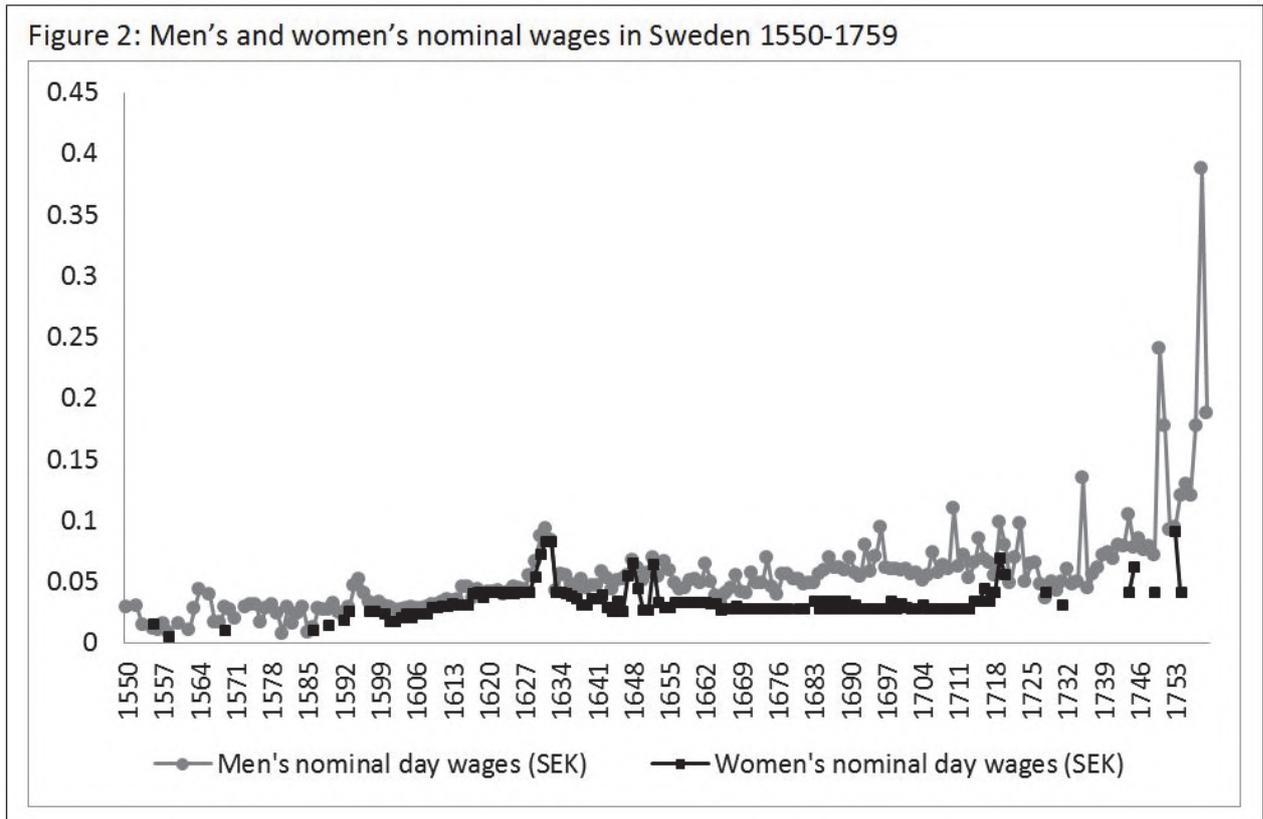


Figure 1 shows the development of women's relative wages in Sweden 1550-1759. Some shifts in women's relative wages are directly connected to historical events. The data from Kalmar, an average Swedish town with about 2,000 inhabitants around 1700 (Andersson-Palm 2000) is more complete than the data from other sources. Kalmar was previously a border town between Sweden and Denmark; the Kalmar War was fought between these two countries 1611-13, and the high wage ratios in the 1610s-20s are likely due to rebuilding efforts coupled with a fall in male labour supply. Kalmar continued to face high labour demands: though not visible in the aggregate series peaks in Kalmar women's relative wages reached as high as 1.33 in individual years during the late 1640s-50s, directly following a fire that devastated the town in 1647 and necessitated rebuilding at a new location (Hedlund, 1982).

After these building crises women's wages fall as low as 40 per cent of men's – this drop can be seen clearly as women's nominal wages stagnate while men's rise (figure 2). Women's wages catch up to men's starting in the eighteenth century, and climb through the end of the period.

Demand-pull on women's work

Figure 3 shows the development of total labour demand, proxied here as the total annual number of paid work days, together with women's relative wages. This comparison is somewhat flawed; the women's relative wage data contain published data from Stockholm, while the labour demand data do not. However, the development of women's relative wages is quite consistent with and without Stockholm's inclusion.



Building demand and women's relative wages were strongly associated. It is clear that women's relative wages are higher in periods of greater labour demand, falling when work disappears, and recovering again with a renewed building market. Again, the 1640s-50s were characterized by extensive construction work in Kalmar, though in the private sphere.

Women's economic response to different labour demand intensities is strengthened when looking at the changing sex composition of the workforce. Because the records from Kalmar identify almost all workers by gender I use it as a case study.

Table 1 shows the number of payments made to women working as a percentage of all payments to unskilled workers in Kalmar and as a percentage of skilled and unskilled workers in Kalmar, compared to the number of workers being paid. The 1620s and 1630s were the biggest years for construction, likely due to the extensive repair work necessary after the Kalmar War. Women regularly comprised the bulk of the unskilled labour pool, and even when skilled (male) labour is included they still constitute half of all builders.

When building intensity declined women were a smaller proportion of the labour force. Intuitively, the number of people employed on each individual project is also smaller when overall building demand declines. This is an important feature for understanding women's relative wages: when women were working in large groups alongside men, wages were typically equal. It is when women worked in smaller groups, or apart from men, that their wages were typically lower. In addition to giving evidence to women's agency, however limited, this also indicates that women were able to take part in some degree of collective bargaining when their numbers were stronger.

After the fire in 1647 the Swedish government elected to rebuild Kalmar at a new location, and tax reliefs were offered to burghers who rebuilt in stone instead of wood (Hedlund, 1982); mason’s assistant was a very feminized occupation in Kalmar, and so we can assume that this type of female labour was in high demand in these years, though it is not reflected in the cathedral archives presented here. This can explain women’s high wages in this decade, despite the lower number of work days in this source. This also explains the large proportion of skilled workers, in these years predominantly carpenters; carpenters usually worked alone, while masons typically worked with unskilled assistants.

Table 1: Women’s work days as a percentage of all workdays in Kalmar, 1614-1706. Workdays rounded to nearest full day.

	As % of unskilled workdays	unskilled workdays (n)	As % of total workdays	Total workdays (n)
1614- 1620	68.6	2502	39.0	4406
1621- 1625	31.8	4039	18.6	6903
1626- 1630	60.8	2907	52.7	3354
1631- 1635	69.4	762	54.1	977
1636- 1640	54.5	130	11.5	607
1641- 1645	40.3	144	38.4	151
1646- 1650	18.9	354	4.2	1601
1651- 1655	13.2	46	6.2	97
1656- 1660	0	69	0	73
1661- 1665	0	13	0	20
1666- 1670	0	27	0	130
1671- 1675	17.4	383	15.2	438
1676- 1680	100	13	52.0	25
1681- 1685	27.8	18	15.4	33
1686- 1690	20.0	175	16.3	215
1691- 1695	5.7	35	4.1	49
1696- 1700	4.1	122	4.0	126
1701- 1705	0	135	0	135
1706- 1710	0	13	0	51

<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #333; margin-right: 5px;"></div> > 60% women </div>	<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #ccc; margin-right: 5px;"></div> Top quartile (n) of workdays </div>
<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #999; margin-right: 5px;"></div> 30-59% women </div>	

This can explain women’s high wages in this decade, despite the lower number of work days in this source. This also explains the large proportion of skilled workers, in these years predominantly carpenters; carpenters usually worked alone, while masons typically worked with unskilled assistants.

Women’s responses to high labour-demand periods should encourage us to look at complex influences on women’s work to supplement supply-side frameworks relating work to marriage and childbirth.

Women’s work days

A closer look at individuals’ work patterns also gives insight into the differences between men’s and women’s labour. In Kalmar, we can individually trace workers and account for how many days they worked every year. There is one individual who works far more than anyone else in the entire dataset – a woman, Anna Dikerska. Because she is a strong outlier I look at women’s annual work days both with and without her included.

Anna’s unusual work habits are visible in the original sources, even without any statistical analysis. The original data are organized into weekly

payments, recording men and women together, in order of days worked in the week. Those who worked the most days top the list, a position consistently held by Anna Dikerska with six-and-a-half days weekly.

Table 2 shows the average number of days worked in a year by unskilled men, all women, women without Anna Dikerska included, and skilled men. Skilled men worked the most, which is reasonable, as they were specialized. What is less expected is that women, while fewer in number than unskilled men, worked more than man in a physical industry. This could be due to several things – for instance, it could indicate that unskilled men had other options than women for earning an income on a casual basis, or that this employer in particular was more inclined to hire women. But it remains clear that women were a regular presence in the construction industry.

	mean	s.d.	min	median	max	n
unskilled men	8.87	14.05	0.5	5	143	377
women	15.7	15.7	1	7	141	243
women w/o A.D.	11.35	15.73	1	6	114	242
skilled men	31.82	36.92	0.5	14	144	99

Qualitative evidence from southern Sweden

A constant refrain from those who study women and their wages is the tendency for women to slip through the cracks of the historical record (Humphries and Sarasua 2012). This is certainly the case in this study as well. A female worker can be identified either through a gendered occupational title, a female relationship indicator, or through her name. In Kalmar virtually every individual is named, making gender identification straightforward.

In Malmo fewer workers are named, and many have no gendered title. Women are sometimes identified as a digger's wife (*grävarens hustru*), but most often they are called simply a digger (*grävare*), the same title given to men. In these cases women are only identifiable if their name is included, but because many are unnamed they are misidentified since workers are assumed male by default.

While possibly less common than in Kalmar, women's paid construction work also seems to have been regularized in Malmo. The lack of gendered titles implies that women's work was not seen as different enough to warrant recording separately. When women were given gendered titles it appears to have been arbitrary. Karine, wife of Niels the digger (possibly Niels Graffuer), appears at least five, and possibly six times, 1589-93. She is never named in the same way twice; she is Nils' Karine (Karine Nilssis); Niels' woman Karine (*Niels kvinna Karine*); and Karine Gräverska (Karine Digger). Her occupation is recorded once as just a digger (*grävare*) and twice as digger's wife (*grävares kvinna*). In 1592 another Karine, Karine Wogns, is paid 12 *skillings* for one-and-a-half days' work on the foundation of Malmo castle's east tower. She worked with her husband, Wogn Jensön, who receives eight *skillings* for one day's work, the same per-day rate as Karine. For both Karines neither their occupational titles nor their wage identify them as female – it is almost certain that other women are not identifiable at all.

Kalmar's Anna Dikerska is notable because of her work habits, but also because of her surname; it is an occupational title, rather than the typical patronym of pre-twentieth century Sweden. She is one of a small number of women who appear with an occupational title as her surname, along with Karine Gräverska and Anna Kalkslagerska. Some master men adopted the names of their professions, of course; there are men called '*Murmästare*' (mason) and '*Timberman*' (carpenter), but in general women with occupational names are rare. The women's titles are less prestigious than the men's; '*Kalkslagerska*' is a mortar mixer or plasterer, and '*Grävare*' and '*Dikerska*' are diggers. The suffix '*ska*' unambiguously indicate that these titles are female, and not inherited from a father or husband. Instead these names must refer to these women's identification as professional, or at least publically recognized, construction workers.

Conclusion

This study has shown that not only did women work extensively in the early modern Swedish construction industry, but that they were able to command high wages when labour demand was high, and entered construction work in response to demand factors. The combination of the potential for women to earn wages on par with their male peers in construction, a physical industry, argues against women being less productive workers than men, or at least against a payment structure based on such a relationship, as in Burnette (2008). At the same time, high earning periods alongside periods of decline argue against pure discrimination, as in Bardsley (1999), though it does indicate some reversion to a discriminatory state after the building crises were over, in which women were not the preferred workers. When physical labour was needed women were not excluded or underpaid, especially when recorded in the payrolls directly with men – women’s relative wages are often lower when they were worked without men, indicating women yielded a certain amount of bargaining power in periods of high work demand, though it was unsustainable. Together this indicates a limited agency due to demographic pressures and labour needs, as theorized to have happened after the Black Death (van Zanden 2011). Women’s response to demand factors also enriches a literature which tends to focus on the supply side of women’s labour in pre-industrial Europe (see Humphries and Weisdorf 2015; van Zanden 2011), and urges us to continue investigating historical labour markets in deeper detail.

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Ystad stadsarkiv: Rådhusrättens och magistratens arkiv (Ystad city archive: City Hall Court and magistrate archive)

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Vittskövle

Malmö Stadsarkiv (Malmö City Archives)

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S:t Petri kyrkoarkiv (*Saint Petri church archive*)

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The outports versus the metropolis: Practical responses to restrictions on the overseas tobacco trade in seventeenth-century England

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In April 1671, an anonymous adviser to Parliament proposed that all colonial tobacco should be imported into the port of London only. The writer perceived other ports in England as a threat to London's pre-eminence over the tobacco trade. According to the writer, tobacco imports to places other than London – the so-called outports – had contributed to two fundamental problems. First, merchants in the outports concealed significant proportions of their tobacco, thereby diminishing the king's revenue. Subsequently, and second, tobacco stalks and other impurities were used in London to compete with merchants in the outports. What was more, the author claimed, it was only in the last 15 years that the outports were permitted to import tobacco; this was a break with the past that was 'inconsistent with the interest of the king and kingdom'.³¹⁸

The proposal to restrict tobacco imports to Restoration London was never implemented. However, the concerns of the anonymous writer reveal how some tobacco merchants in the city felt threatened by competition from traders further afield. Indeed, as the anonymous proposer asserted, during Charles I's reign (1625-42) direct tobacco imports had been theoretically restricted from the outports. Furthermore, a raft of legislation on the tobacco trade remained in force either side of the English Civil War; the primary aim of which was to increase central state revenue through levying import duties.³¹⁹ As one might expect, however, the embargo and import duties created opportunities for the illicit trader; opportunities that I've termed as 'practical responses' owing to the sometimes semi-legal justification for such trade. This paper assesses these practical responses during Charles I's Personal Rule (1629-40). I begin by quickly outlining the two central restrictions on the tobacco trade in the first half of the seventeenth century. I then analyse two categories of practical responses: customs fraud and direct smuggling.

I

The main restrictions on the seventeenth-century tobacco import trade can be summarized as follows. In the first instance, all tobacco had to pay import duties. Under Charles I these were made up of what were technically two distinct indirect taxes: the subsidy, which was 5 per cent of good's value as determined by the Book of Rates; and the impost, valued in 1634 at four pence per pound of Virginian tobacco and six pence for every pound of West Indian tobacco. The impost was justified by the royal prerogative and, in 1641, was subsequently declared illegal by Parliament.

Second, tobacco imports outside of London were closely monitored. From 1625 onwards, the direct trafficking of tobacco was theoretically prohibited from every port except London. On paper this gave the capital a monopoly on the tobacco trade.³²⁰ Only after payment of customs and manufacturing in London, was tobacco to be shipped coastwise or overland to other destinations. However, as we shall see, this prohibition was not strictly observed. Concessions by way of special licences were granted to privileged merchants.

³¹⁸ Harley MS 1238 no. 12, pp.20-27. The proposal is untitled.

³¹⁹ See below.

³²⁰ See proclamations of Charles I: 1625, 1627, 1634, 1638 and 1639.

Figures provided by Neville Williams long ago show a healthy trade across the outports between 1621-31.³²¹

For the remainder of this paper, I show how these two restrictions were circumvented throughout the pre-civil war period. In particular, the concentration of incidents in places like Bristol explains how the tobacco trade dominated the port's economy when official surviving trade records begin in the 1650s. During the 1620s and 1630s, Bristol was second only to London as the largest port in early modern England. However only relatively small amounts of tobacco are recorded in the port books for these decades. For example in 1627, just over 8,000 lbs. of tobacco arrived lawfully into the city. This was during a time when some half a million pounds were imported nationally.³²²

However, over the next decade more tobacco arrived in Bristol than official figures would suggest. There existed two main techniques to circumvent the above restrictions. The first was through connivance with customs officers. Before 1640, the use and abuse of the import-by-licence system enabled leading merchants to import significant quantities of tobacco. The second technique did away with the customs officers. By directly smuggling (or 'running') tobacco ashore, mariners and planters similarly brought considerable quantities of tobacco into the western city.

II

Despite the embargo on tobacco imports, the Lord High Treasurer granted special licences that allowed merchants to import tobacco into the outports. In 1637, one Richard Lock was granted a warrant to import tobacco from St Kitts.³²³ Lock was a foremost Bristol merchant and a member of the city's principal trading organization: the Society of Merchant Venturers.³²⁴ One William Pennoyer owned a second licence to import tobacco to Bristol. The son of a Bristol glover, Pennoyer was based in London for much of his mercantile career although he evidently held commercial influence in both cities.³²⁵ Whereas the amount that Lock was allowed to import was unspecified, Pennoyer's permitted allowance was capped at 9,000 lbs.³²⁶ Domestic traders, too, testified that they had purchased tobacco from certified individuals. One Nathaniel Cale, a Bristol soap-maker confessed that he and 'others of his company' had purchased 40,000 lbs. of tobacco from a tobacco customs commissioner.³²⁷ This commissioner was part of a private syndicate that collected the tobacco impost on behalf of the crown.³²⁸

Both the tobacco commissioner's sales and the Lord Treasurer's warrants transmitted authority that superseded any customs officer's. Such trade thereby remained above board, if contrary to royal proclamation. Transactions such as these demonstrate how the overseas and domestic trades operated in practice, away from the wording laid down in royal declarations. Nonetheless, there was still something suspicious about these special licences. For instance, there is no evidence that import duties were paid for the tobacco in question. The port book for 1638 recorded two ships as having discharged unspecified amounts of tobacco, along with a third entry simply stating that there were 'more certaine rowles resting in the

³²¹ Neville Williams, 'England's tobacco trade in the reign of Charles I', *The Virginia Magazine of History and Biography*, 65, 4 (1957), pp.403-49, 408, 419-20; *Acts of Privy Council, 1627-1628*, p.349; *Acts of the Privy Council, Colonial Series, I*, 123-124.

³²² Williams, 'England's tobacco trade', pp.403-49, 419-20; TNA E 190/32/8.

³²³ TNA E 134/17Chas1/Mich29, 'Miles Lavington v Brian Rogers, William Pennoyer and others', see 3rd interrogatory for the plaintiff and deposition of Anthony Harrison.

³²⁴ Lock was admitted into the society in 1632, see Patrick McGrath, *Records Relating to the Society of Merchants Venturers* (Bristol, 1952), p.28.

³²⁵ Robert Brenner, *Merchants and Revolution* (London, 1993)

³²⁶ TNA E 134/17Chas1/Mich29, 4th interrogatory for the plaintiff and deposition of Anthony Harrison.

³²⁷ TNA E 134/17Chas1/Mich29, deposition of Nathaniel Cale.

³²⁸ *Ibid.* The tobacco commissioner, or customs farmer, was Timothy Butts. See TNA E 44/56; TNA E 214/583.

warehouse'.³²⁹ However, there was no exact amount recorded nor was there a record that import duties were paid. Instead the clerk noted that the tobacco was 'landed without lawful order.'³³⁰ In addition, at least two other tobacco ships also arrived in Bristol in this year, although these vessels were not mentioned in the port book.³³¹

The import-by-licence system was, moreover, open to abuse. For instance, one local customs officer accused his superior, the collector of Bristol, of forging such warrants.³³² These forgeries ostensibly permitted the aforementioned William Pennoyer to import more tobacco than was specified in his official licence. In connivance with Pennoyer, the collector had allegedly monopolized tobacco from two of the ships that came into Bristol by forcing the owners to either sell their tobacco at below-market rates or to pay exorbitant import duties, over three times the impost.³³³ The potential profits made following the tobacco's resale would have been huge: each ship contained a considerable amount of tobacco. One boatload alone held 420 tobacco rolls, each of which weighed at least 50 lbs.³³⁴ Another consignment was later appraised at over 70,000 lbs.³³⁵

The collector no doubt received some form of compensation for forging the warrants, although there is only a hint in the records that he was bribed. However even the port's controller (another chief officer), but who was not directly involved in the scheme, was given some tobacco for permitting tobacco to be landed at the port. The controller played down this inducement by claiming that it was only 'one salt wett roll' of tobacco. In other words, the tobacco was a trivial amount because it had been damaged by saltwater.³³⁶ Even so, the collusion of the chief officers of Bristol with some of the main Bristol merchants made prosecution difficult. Many witnesses seemed to agree that the collector had been acting within the law but as with the licences more generally, suspicions were aroused.

III

Other cases of tobacco trafficking were manifestly illegal. For instance, earlier inquiries at Bristol concerning goods taken as prize during the Anglo-Spanish war (1625-30) unearthed several cases of direct tobacco smuggling.³³⁷ By this, I mean the direct 'running' of tobacco ashore without the collaboration of officers. One John Evans, a sailor, reported that men had clandestinely brought ashore five tobacco hogsheads.³³⁸ During the same inquisition, customs officers similarly claimed that large quantities of Spanish tobacco, along with Spanish wool and salt, were entered without entry.³³⁹ A further eight tobacco hogsheads, probably Virginian and of 'very good value' were concealed and illicitly imported without any payment of duties. At least two principal merchant venturers – William Fitzherbert and Richard Vickris – were indicted in the last two incidents here.³⁴⁰

These early cases of tobacco smuggling were not exceptional. During the 1630s, tobacco continued to be illegally trafficked into the city of Bristol. Local boats were used to transport packages from ships lying at anchor outside the mouth of the river Avon. One of these ships carried the planters themselves, who had sailed across the Atlantic with their year's crop. During one winter's night in 1635, several boats were used to smuggle what was,

³²⁹ TNA E 190/1136/10.

³³⁰ *Ibid.*

³³¹ TNA E 134/17Chas1/Mich29, deposition of Anthony Harrison.

³³² TNA E 134/17Chas1/Mich29, 11th interrogatory for plaintiff and deposition of Anthony Harrison.

³³³ TNA E 134/17Chas1/Mich29, 13th interrogatory for plaintiff depositions of Anthony Harrison, Richard Goodyear, Robert Neason and John Bush.

³³⁴ TNA E 134/17Chas1/Mich29, deposition of Thomas King.

³³⁵ TNA E 134/17Chas1/Mich29.

³³⁶ TNA E 134/17Chas1/Mich29, deposition of John Ham.

³³⁷ TNA E 178/5319, 'Bristol Inquisitions as to unlawful exports and imports'.

³³⁸ *Ibid.*, deposition of John Evans.

³³⁹ *Ibid.*, unspecified deponent.

³⁴⁰ *Ibid.*, unspecified deponent.

according to one witness, forty tons of tobacco directly into the city. The parcels were taken to Redcliffe on the southern side of Bristol rather than the city's main quay.³⁴¹ As above, a prominent merchant venturer – Thomas Heathcott – was implicated in the scheme as the tobacco was deposited at his house. However, a host of other individuals were involved, including mariners, boatmen and porters. Furthermore, such profiteering was not limited to men. Heathcott's wife was cited for selling-on tobacco from her husband's house whereas in a similar scheme the daughter of 'one Cox' held shares in the contraband tobacco.³⁴²

Other successful attempts at smuggling tobacco in Bristol involved landing the tobacco in more obscure locations and concealing it in a safe house, before transporting the contraband into the city overland. For instance, around thirty horse loads of tobacco were concealed in an outhouse in north Somerset during the early 1630s.³⁴³ Sixteen loads (each weighing 'two hundred pound weight or thereabouts') made their way to Bristol and were deposited with one Mr Whitton's at the Red Lion on Redcliffe Street.³⁴⁴ The remainder of the same shipment was taken to Bridgewater.

Unlike customs frauds, smuggling did not require cooperation with customs officers. In any case, there were many incidences of tobacco being directly smuggled into Bristol during the pre-civil war period that circumvented the import-by-licence system and which increased the amount of tobacco that arrived annually.

IV

A number of conclusions can be drawn from this paper. First, there are obviously problems involved in using just the port books to give an estimation of trade in the early modern period. Although no attempt is made in my work to quantify the illicit tobacco trade, tobacco imports were clearly higher than official sources would suggest.³⁴⁵ This is not saying anything new, however; but I think that highlighting several depositions does demonstrate the extent of illegal trade in some parts of the country as well as showing some of the techniques that were used. Although I have focused on Bristol, similar stories could also be told for elsewhere, particularly in the southwest region and around the Thames estuary.³⁴⁶

Second, illicit trade in this period can help explain how the tobacco trade developed in Bristol during the 1650s and onwards. When official records do begin, in 1654/55, Bristol tobacco imports stood at 3,400 hogsheads (1 million lbs.) and grew to over 10,000 hogsheads (3 million lbs.) per annum by the mid-1670s.³⁴⁷ Customs fraud in the 1630s, moreover, set a precedent for mercantile practices later in the century. The anonymous writer of the 1671 proposal mentioned in my introduction, for instance, alleged that vast quantities of tobacco avoided payment of customs in the outports. The writer specifically cited Bristol as well as Plymouth and Liverpool.³⁴⁸ Indeed, as W.B. Stephens has recently shown in his excellent monograph, when a customs-surveyor was sent to Bristol ten years later, the officer found a customs service riddled with corruption.³⁴⁹

Third, and this is something that my thesis explores further, is that there often appears to be a fuzzy definition of illegal and legal tobacco imports. The granting of special licences is

³⁴¹ TNA E178/5239, depositions of Thomas Robins, John Hall, John Butler, John Lane, Patrick Neason, William Evans, Edward Iles and William Brutton.

³⁴² Ibid.

³⁴³ TNA E178/5239, depositions of Lawrence Kaynes and Walter Patience; see also TNA E133/160/60, deposition of Walter Patience.

³⁴⁴ Could this Mr Whitton have been Mr Christopher Whitson, a member of the Bristol SMV?

³⁴⁵ Robert Nash has attempted quantification for the early C18th tobacco trade.

³⁴⁶ For example.

³⁴⁷ Bristol Record Office, SMV 7/1/1/1; SMV 7/1/1/6.

³⁴⁸ Harley MS 1238 no. 12, pp.20-27.

³⁴⁹ W. B. Stephens, *The Seventeenth-Century Customs Service Surveyed: William Culliford's Investigations of the Western Ports, 1682-84* (Farnham, 2012), pp.13-49; TNA, T 64/139.

a case in point: the practice of legitimate imports during the 1630s contradicted what was stated in royal proclamations; nonetheless, such imports were seemingly permissible.

And finally, also with utmost relevance for my thesis, is that early modern consumers had access to a wide-range of different tobacco. Variation encompassed not just the location of origin and who and where English suppliers were based, but also whether tobacco was legitimately imported or not. I have stated that there is no way of knowing the true extent of unofficial trade, but I believe that a considerable factor for the spread of smoking in the seventeenth century was the availability of tobacco that was cheap and ‘uncustomed’ (as contemporaries termed it). The concerns of the anonymous proposer mentioned at the start of this paper were probably warranted. Unrealistic regulative measures contributed to substantial quantities of unwholesome assortments of tobacco making their way into the pipes of English consumers.

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Walled cities and urban density: Evidence from prefectural-level cities in China

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1. Introduction

Throughout the imperial era, Chinese cities were surrounded by defensive walls. Although almost all of those city walls have vanished, many of the cities have survived. This study analyses a sample of nearly 300 prefectural-level cities in China at the present time, among which about half had city walls in history. The estimation results document that cities that had walls in late imperial China have higher population and employment density today, despite the fact that their walls have long gone. This paper proposes several possible explanations of this fact. Using data from various sources, this study tests which explanation is more plausible. Empirical findings contribute to the budding literature on the persistence of urban economic activity.

This study is motivated by the observation that many historically-walled cities are sites of major cities today. We present three major questions regarding this phenomenon: Have the cities declined since the obsolescence of initial advantages? Did the rise and decline of the city walls alter the economic path of the city? How can we empirically test the hypotheses through which the persistence of economic activity is achieved? These research questions all belong to an important theme in the field of economic geography – path dependence. The theory holds that the ultimate outcome of density distribution might depend on a series of historical shock, which are the rise and fall of ancient city walls in our context.³⁵⁰

Complementing the existing literature, this paper attempts to interpret the economic persistence in China from a new perspective – the rise and the demolition of Chinese ancient city walls. This study is related to this wide literature in a sense that the existence of defensive walls in China, which lasted for over a century, offers a historical shock that might have a permanent effect on the distribution of economic density.

The paper uses a simple regression model to empirically test the long-run impact of building ancient defensive walls on the persistence in the distribution of economic activity. This study adopts the presence of walls as a proxy for city age, since walled areas were likely to be the sites that first became a city due to their early advantage in local competition. Old cities tend to have higher intra-urban density, suggesting a positive effect of wall presence on the persistence of urban density. G. Williams Skinner's unique data on the presence of Chinese ancient city walls allows us to empirically test this association. Data on other controls are obtained from the China City Statistical Year Book.

Estimation results show a strong positive association between the wall presence and the persistence in economic density in modern China. We attribute the persistent urban density in historically-walled cities to their success in locational competition because of the initial benefits from the construction of city walls. As extinct portage sites and street car stations, cities with defensive walls attracted commerce, manufacturing and supporting services during the early commercialization in China. Defensive walls provided these sites with early advantages to accumulate local institutions as well as other urban amenities,

³⁵⁰ For a broader range of literature studying the location of economic activity across regions or cities, see Hanson (1996,1997), Davis & Weinstein (2002, 2008), Kline & Moretti (2014), Redding & Sturm (2008), Redding et al. (2011), and Ahlfeldt et al. (2015).

resulting in a higher initial population growth which then led to a higher growth in the subsequent centuries.³⁵¹

2. Empirical model

The baseline regression equation to estimate in this study is as follows:

$$\log(\text{density}_i) = \alpha \text{wall}_i + \beta \log(\text{size}_i) + \mathbf{X}_i \gamma + \epsilon_{ij}$$

We regress population or employment density on a binary variable that indicates the presence of city wall in late imperial China. Both population and employment density are in logarithmic form so as to model any nonlinear data against control variables. In addition, we run two separate cross-sectional regressions in two different years. The regression in an early period allows us to examine persistence of economic density in walled cities, while the one in a more recent year is used to take a further look at the outcome in the long term. The economic concentration is expected to be weaker in the later period as the urban areas have sprawled in recent three decades.

The dependent variable – density_i – represents regional economic density of city i , as measured by municipal district population density or employment density. Since urban functionality divisions and most historic sites were contained inside city walls, the physical and economic boundaries of walled cities might well coincide with each other. There is a reason to believe that the intramural area of historically-walled city is comparable to that of the municipal district in modern China, rather than that of the entire city. In this sense, population density and employment density at municipal district level can be appropriate measures of regional economic density.

The key independent variable — wall_i — is a dummy variable indicating the presence of defensive city wall in city i between 1820 and 1893. α is the key parameter to estimate, which measures the strength of persistence in economic density. City wall presence is used as a proxy for city age. We expect a positive sign of α , as theories of local fundamentals and increasing returns suggest a positive correlation between city age and intra-urban density. size_i stands for contemporary city size as measured by municipal-district-level GDP. \mathbf{X}_i is a vector of contemporary prefectural-level characteristics, such as average personal incomes, share of service sector, number of industrial enterprises, etc.

The regression analysis also controls for some other observable differences to reduce potential omitted variable bias. First, seaports are hubs of commerce and trade and they attract certain economic activity because of their locational advantages. A harbour plays a central role in local economic life and may have continued value to the present day. Failure to control for this long-lasting feature could confound the attempt to attribute the persistence of density to the presence of a city wall. Second, cities were made provincial capital often for historical reasons. Provincial capitals are likely to be regional hubs in ancient China. The status of provincial capital could be positively correlated with the presence of city wall as well as local urban amenities.³⁵² Third, residents enjoy cultural and historic amenities. Population and employment density are usually higher around historic and cultural site. In this sense, the persistence of economic density in walled cities may result from the fact that most historic and culture sites formed inside city walls.³⁵³ Controlling for a variety of prefectural-level features reduces potential omitted variable bias as there is a positive association between these factors and city age. Since most of these factors are expected to have a positive effect on regional economic density, the failure to control for them may result in an upward bias in the coefficient estimate.

³⁵¹ For publications on path dependence of economic density distribution, see Bleakley & Lin (2012), Michael et al. (2012), and Brooks & Lutz (2014).

³⁵² See Chang (1977, p.90, p.95).

³⁵³ See Chang (1977, p.94)

Despite potential sources of endogeneity, the main regression specification does not include the regional specific fixed effects as there are concerns about losing some of the variations in wall presence across regions. Another concern of this approach is that locational fundamentals and urban institutions might be time-invariant and specific to regions as well. Therefore, controlling for fixed effects might absorb the effect of natural attributes and accumulated urban amenities that change little over time. It is difficult to disentangle these contributing factors of persistent density distribution without detailed information on geographic features as well as urban institutions.

3. Data

The data on ancient city walls come from the G.W. Williams's "ChinaW" dataset. An organized version can be obtained from the China Historical GIS at Harvard University. The data were originally compiled by Yue Zumou, G. William Skinner, and Mark Henderson.³⁵⁴ The "ChinaW" dataset contains a record for every city that served as an administrative capital during the period 1820-93. The sample dataset contains 1,761 geographic units and has detailed information on presence of wall, wall circumference, height of wall, thickness of wall at base and top, construction material of wall, number of sentry posts on the wall, etc. Note that this study only uses the presence of defensive walls during this period. The dataset also contains a record for every yamen³⁵⁵ at the prefectural and county levels and for every territorial unit at the county level of the field administration. This paper uses municipal district population and employment density from China City Statistical Year Book to measure local economic density. Such data have been made available since the publication of a 1985 city statistic year book (1984 sample). Extensive research shows that population and employment density capture underlying variations in local productivity and quality of life.³⁵⁶ These two measures would be equivalent under the assumption of inelastic labour supply and full employment. Moreover, population density also reveals an individual's preferences over local areas (Tiebout, 1956).

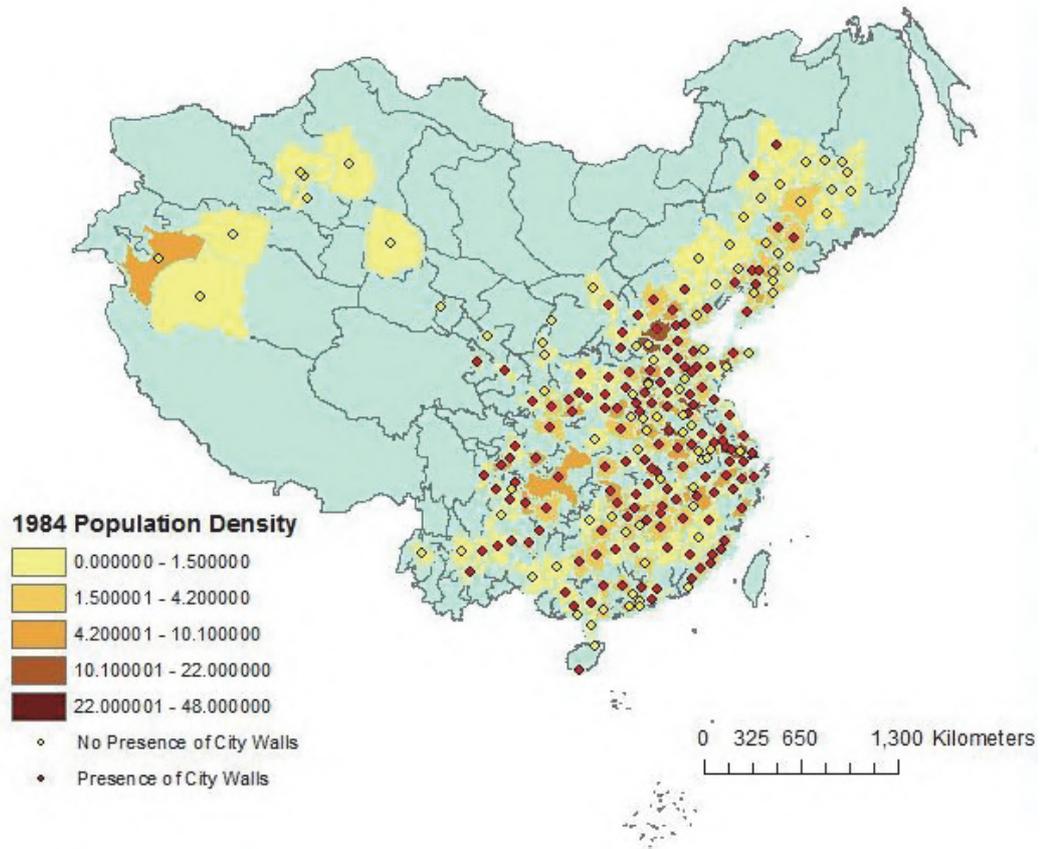
Figures 1 and 2 show the geographic distribution of population density and employment density in both the 1984 and 2013 samples. The map uses the historical domain of imperial China in the seventeenth century. Panel (a) presents the geographic distribution of economic density from prefectural-level cities in the 1984 sample, while panel (b) shows the spatial distribution of economic density from prefectural-level cities in the 2013 sample.

³⁵⁴ See Yue Zumou et al. (2007).

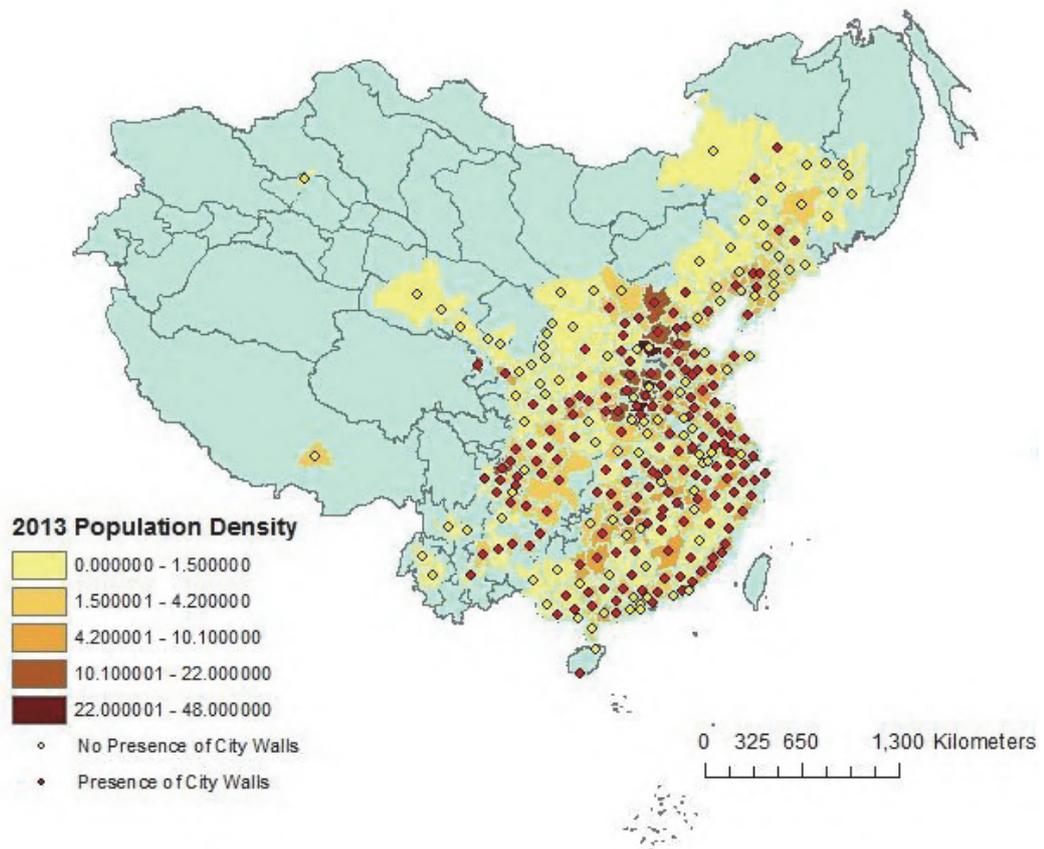
³⁵⁵ A yamen is any local bureaucrat's, or mandarin's, office, and residence of the Chinese Empire. The term has been widely used in China for centuries, but appeared in English during the Qing dynasty.

³⁵⁶ See Haurin (1980), Glaeser et. al. (1992, 1995), Ciccone & Hall (1996), Rapport & Sachs (2003).

Figure 1: *Geographic distribution of population density*

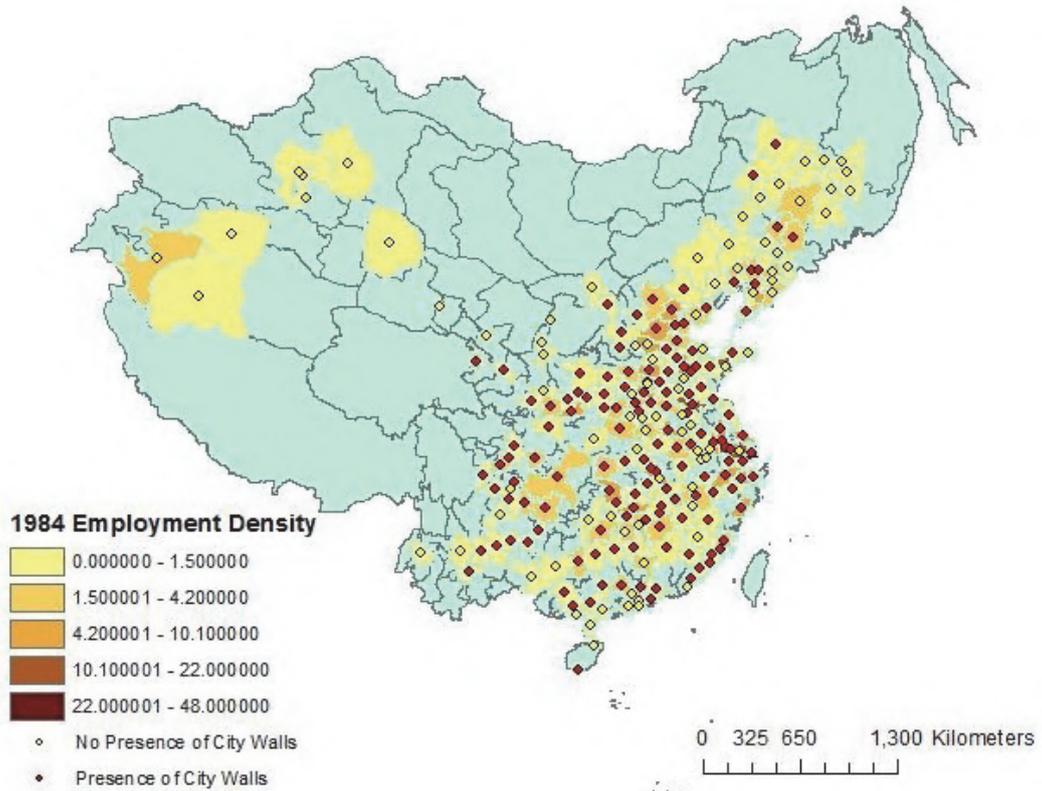


(a) 1984 Population density

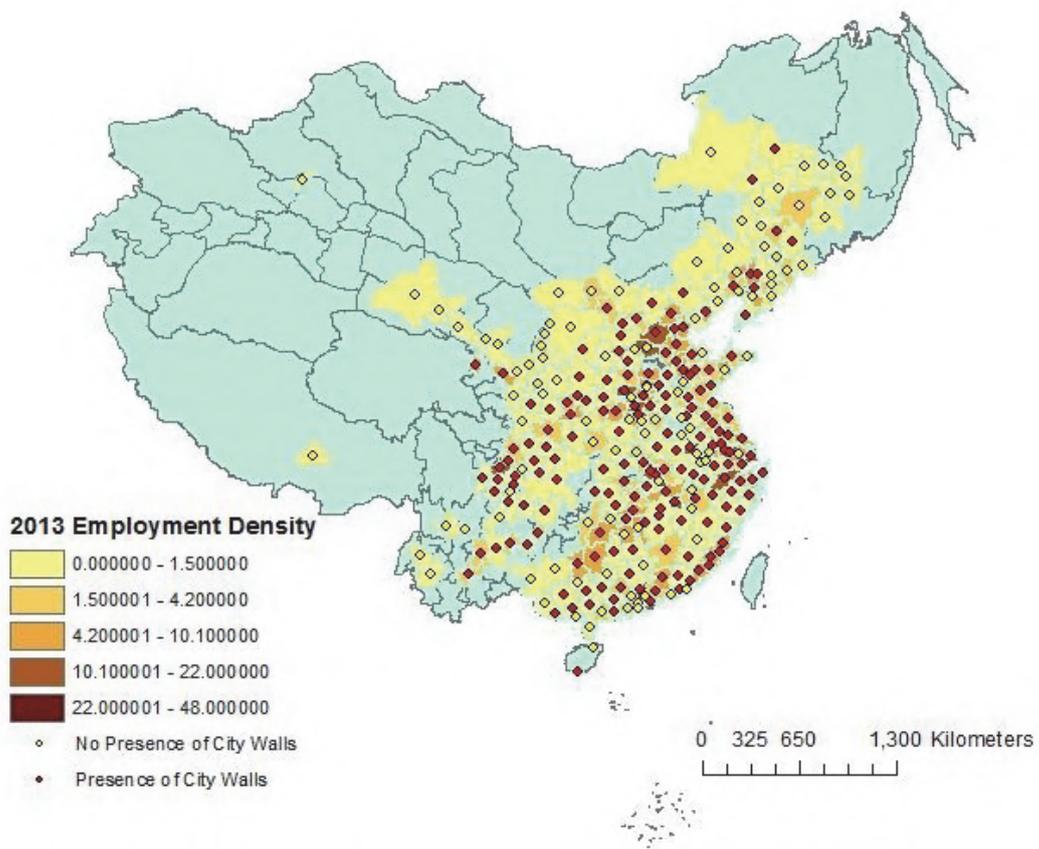


(b) 2013 Population density

Figure 2: Geographic distribution of employment density



(a) 1984 Employment density



(b) 2013 Employment density

Table 1 presents the description for the variables used in the regression analysis. Table 2 presents the statistics for two subsamples – walled and non-walled cities. Some preliminary results can be drawn based on this comparison. In accordance with predictions based on the theories of locational fundamentals and increasing returns, descriptive statistics show that population and employment density are higher in cities with the presence of defensive walls in late imperial China, suggesting the presence of persistent economic activity in these historically-walled cities.

Table 1: *Variable description*

Variables	Description
Wall presence	
<i>Wall</i>	Presence of defensive city wall (1820-1893)
Prefectural level characteristics	
<i>Population density</i>	Municipal district population density (person/km ²)
<i>Employment density</i>	Municipal district employment density (person/km ²)
<i>Population</i>	Municipal total population (×10 ⁴)
<i>No. of Historic sites</i>	Number of major national level historical/cultural sites
<i>GIOV per capita</i>	Municipal district per capita gross industrial value of output (×10 ⁴ yuan)
<i>GIOV</i>	Municipal district GIOV value (×10 ⁸ yuan)
<i>GDP per capita</i>	Municipal district per capita gross domestic product (×10 ⁴ yuan)
<i>GDP</i>	Municipal district total GDP value (×10 ⁸ yuan)
<i>Service share</i>	Share of service sector
<i>No. of industrial firms</i>	Number of industrial enterprises in municipal district
<i>Capital</i>	Whether the prefectural level city is the provincial capital
<i>Port</i>	Whether the prefectural level city has a port

Table 2: *Summary statistics – cities with and without wall presence*

	1984			2013		
	Obs.	Mean	Std. dev.	Obs.	Mean	Std. dev.
Panel A: non-walled cities						
Population density	143	735.958	945.319	110	751.034	939.530
Employment density	143	292.599	489.370	104	184.912	259.164
Population	143	44.451	36.212	110	137.575	248.433
GIOV/GDP	143	8.886	13.801	110	798.222	1.230
GIOV/GDP per capita	143	0.175	0.165	110	7.141	5.881
No. of historic sites	143	2.189	4.021	110	2.855	4.447
Service share	143	0.140	0.085	109	0.488	0.164
No. of industrial firms	143	269.105	290.915	110	404.718	941.113
Capital	143	0.021	0.144	110	0.036	0.188
Port	143	0.070	0.256	110	0.100	0.301
Panel B: walled cities						
Population density	145	1330.903	1856.885	176	1011.292	793.697
Employment density	145	561.502	1034.386	171	274.494	346.546
Population	145	86.852	100.518	176	159.321	208.638
GIOV/GDP	145	24.375	57.750	176	1560	3030
GIOV/GDP per capita	145	0.219	0.169	176	6.955	4.975
No. of historic sites	145	7.717	13.122	176	6.722	12.123
Service share	145	0.145	0.066	176	0.503	0.136
No. of industrial firms	145	592.021	740.896	176	659.932	1163.490
Capital	145	0.166	0.373	176	0.148	0.356
Port	145	0.117	0.323	176	0.114	0.318

4. Results

Tables 3 and 4 present the baseline regression results of the 1984 and 2013 samples. Columns (1) - (3) present population density regression results using data in the 1984 sample, while columns (2) - (4) report employment density regression results from the 1984 sample. To see how coefficient estimates behave after adding more controls, we run three different regression specifications in each sample dataset. The first regression (columns 1 and 4) is implemented with no controls for the number of historic sites and regional fixed effects. We then add the number of historic sites into the second regression (columns 2 and 5), without controlling for regional fixed effects. The third regression (columns 3 and 6) includes both controls.

In the 1984 sample, a positive, statistically significant coefficient on the presence of ancient city walls across all specifications suggests the persistence of economic density in historically-walled cities. Besides the statistical significance, the degree of persistence is economically significant as well. Population density are 25.2 - 43.7 per cent higher in cities with defensive walls than those in non-walled cities. Employment density regressions render similar results. We observe 24.3 - 34.7 per cent higher employment density in historically-walled cities. Note that both the magnitude and the significance level of the coefficient on wall presence decrease as we add more controls, implying that the permanent change in locational fundamentals mostly comes from other urban amenities that do not change much over time. Furthermore, the wall presence remains significant with the controls for historic sites, rejecting the first hypothesis that population density are persistent in walled cities because residents enjoy quality-of-life amenities inside the walled area.

Table 3: *Baseline density regression results, 1984 sample*

	DV: log(pop. density)			DV: log(emp. density)		
	(1)	(2)	(3)	(4)	(5)	(6)
Wall	0.437*** (0.128)	0.435*** (0.128)	0.252* (0.130)	0.347*** (0.133)	0.337** (0.134)	0.243* (0.138)
Log(1984 GIOV)	-0.218 (0.133)	-0.221* (0.134)	-0.225 (0.137)	-0.585*** (0.138)	-0.599*** (0.139)	-0.641*** (0.146)
Log(1984 GIOV per capita)	1.007*** (0.140)	1.008*** (0.141)	0.952*** (0.144)	1.753*** (0.146)	1.759*** (0.146)	1.743*** (0.153)
No. of historic sites		0.00115 (0.007)	0.000903 (0.007)		0.00534 (0.007)	0.00655 (0.007)
Share of service	4.654*** (0.940)	4.657*** (0.942)	3.645*** (0.981)	2.058** (0.979)	2.073** (0.980)	0.990 (1.043)
No. of industrial firms	0.603*** (0.135)	0.602*** (0.135)	0.601*** (0.142)	0.808*** (0.140)	0.804*** (0.141)	0.845*** (0.151)
Capital	-0.369 (0.236)	-0.377 (0.241)	-0.246 (0.238)	0.0630 (0.246)	0.0260 (0.251)	0.0839 (0.253)
Port	-0.0234 (0.209)	-0.0236 (0.209)	0.0294 (0.216)	0.0852 (0.217)	0.0842 (0.217)	0.140 (0.229)
Regional fixed effects	No	No	Yes	No	No	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
adj. R^2	0.485	0.483	0.527	0.627	0.627	0.643
No. of observations	288	288	288	288	288	288

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Estimation results of 2013 density regressions in table 4 are similar to those in table 3, except for slight differences in the coefficient size and the significance. Population densities are 15.3 - 27.8 per cent higher in walled cities and employment density in walled cities are generally 24.3 - 34.7 per cent higher. Note that, compared to 1984 density regression results, the presence of defensive walls becomes statistically insignificant in the 2013 sample, possibly

due to the massive urban sprawl over the last three decades. Literature shows that there are many factors that can cause the sprawl of urban development.³⁵⁷ After the city walls were demolished, the walled cities might have sprawled without the physical constraint of the urban area due to the massive migration from the countryside. One noticeable sign of urban sprawl in modern China is that a great majority of cities have built ring roads to stretch built-up areas outwards.

Table 4: *Baseline density regression results, 2013 sample*

	DV: log(pop. density)			DV: log(emp. density)		
	(1)	(2)	(3)	(4)	(5)	(6)
Wall	0.275*** (0.101)	0.278*** (0.101)	0.153 (0.100)	0.343*** (0.118)	0.342*** (0.119)	0.186 (0.117)
Log(2013 GDP)	0.270** (0.120)	0.314** (0.124)	0.291** (0.118)	0.0395 (0.139)	0.0365 (0.144)	-0.0111 (0.137)
Log(2013 GDP per capita)	-0.247** (0.116)	-0.263** (0.117)	-0.225** (0.109)	0.492*** (0.136)	0.494*** (0.137)	0.555*** (0.127)
No. of historic sites		-0.00831 (0.006)	-0.00761 (0.006)		0.000552 (0.007)	0.000940 (0.007)
Share of service	-0.721* (0.380)	-0.597 (0.390)	-0.711** (0.357)	-2.033*** (0.438)	-2.041*** (0.451)	-2.173*** (0.411)
No. of industrial firms	0.178** (0.079)	0.181** (0.079)	0.139* (0.081)	0.211** (0.091)	0.210** (0.092)	0.165* (0.094)
Capital	0.0523 (0.214)	0.0897 (0.216)	0.256 (0.201)	0.690*** (0.247)	0.687*** (0.250)	0.920*** (0.234)
Port	0.159 (0.158)	0.135 (0.159)	0.266* (0.151)	0.321* (0.188)	0.322* (0.190)	0.434** (0.180)
Regional fixed effects	No	No	Yes	No	No	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
adj. R^2	0.300	0.302	0.423	0.494	0.493	0.582
No. of observations	284	284	284	275	275	275

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5. Conclusion

In modern China, cities are the key to propelling economic growth and innovation. There are some historical reasons that might help determine the spatial distribution of regional density. This study hypothesizes that the distribution of economic density in modern China might depend on a particular historical shock – the construction of ancient defensive walls. Although cities in late imperial China had a long tradition of building defensive city wall, its role in sustaining the persistence of economic activities has not been well discussed in economics literature. This paper is the first attempt to assess persistence in the geographic distribution of economic density from a new perspective – the presence of ancient city walls.

A simple regression model regresses economic density on the presence of ancient city walls and a variety of other prefectural-level characteristics. The presence of defensive walls in the records of Skinner’s “ChinaW” dataset is used as a proxy for the age of cities in China. Data on other prefectural-level features are obtained from the China City Statistical Year Book. The regression includes these regional features to address the omitted variable bias. Using data from 1984 and 2013, we run two parallel regressions to investigate any differences in the economic concentrations over the last three decades. The estimation results provide suggestive evidence of the role city walls played in sustaining economic growth over recent centuries. Cities with presence of walls in late imperial China have continuing importance in terms of economic density, despite the obsolescence of initial advantages, suggesting the

³⁵⁷ See Burchfield et al. (2006)

importance of path dependence. Estimation results are robust to various measures of economic density and samples. Including Puga's ruggedness index in the regression, estimation results show that cities with more rugged terrain have lower employment/population density. The results also suggest walled cities today tend to have different industry compositions that are un conducive to decentralization. Further analysis shows that quality-of-life amenities (such as cultural and historic sites) cannot fully explain the persistence of economic density in historically-walled cities.

This study presents several plausible hypotheses about the channel through which the persistence in economic density is achieved, including: (1) walled cities have a well-defined historical core that helps hold economic activity close to the city centre today; (2) walled cities are situated in regions where the local geographies make it more difficult to build out; (3) walled cities today tend to have different industry compositions that are un conducive to decentralization; (4) walled cities are located in more populated regions where rural land is more valuable today and resists urban sprawl; and (5) walled cities have more regular shapes that facilitate high density development. To sum up, history provides a shock to locational fundamentals (building defensive walls), which gives rise to a city. In this context, early advantages in locational competition help determine the long-run outcome. On the other hand, economies of density and local institutions contribute to strengthening the degree of spatial differentiation in face of a permanent change in locational fundamentals (the demolition of city walls). This paper argues that locational fundamentals, local institutions, and economies of density together explain the spatial distribution of economic activity.

‘Manchester Goods’: African consumers and the British textile trade with West Africa, 1850-1914

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In the second half of the nineteenth century the majority of printed textiles produced in Manchester and the surrounding towns were exported across the globe, especially to India, South America and Africa. Manchester-made cloth became ubiquitous in West Africa, where the term “Manchester Goods” became current.³⁵⁸ This paper considers the ways in which Manchester Goods were specifically designed for the West African market and the extent to which British manufacturers understood and catered for West African tastes. This paper presents the findings of an analytical survey of over four thousand surviving patterns produced for the West African markets from the 1860s to 1914. These samples are held in the Logan Muckelt collection at the Manchester Archives.³⁵⁹

Market specialization: The argument for material evidence

The history of the textile printing industry in the second half of the nineteenth century is one of increasing specialization for the export markets, which had come to dominate the trade accounting for approximately four-fifths of production by the end of the century.³⁶⁰ Commission merchants and shipping agents were central to the operation of the export trade providing access to vital trade networks, essential knowledge on market demands and undertaking a large proportion of the financial risk.³⁶¹ Merchants increasingly specialized in particular export markets, this specialization then extended to production as manufacturers came to specialize in markets and processes at the demands and instruction of their agents.³⁶²

The process of specialization amongst merchants is visible in the trade directories, shipping lists and business records.³⁶³ The extent of specialization in the manufacturing sector is harder to find but can be seen in the designs produced. With a lack of documentary evidence relating to the specialization of design for export, the designs themselves are a vital source of information. Object-analysis of these designs can reveal the extent to which manufacturers specialized designs for export and what mechanisms they employed to remain successful in an increasingly competitive trade.

Previous studies of export figures and the structure of the trade have linked the declining success of British goods abroad to the refusal of manufacturers and merchants to cater to the tastes of their foreign consumers and for taking export markets for granted, yet without reference to the designs themselves.³⁶⁴ While these studies have undoubtedly contributed significantly to our understanding of the export textile trade, an examination of the material evidence when placed alongside the broader economic fluctuations in the trade

³⁵⁸ Alyson Valda Cooper, ‘The Manchester Commercial Textile Warehouse, 1780-1914: A Study of its Typology and Practical Development’, (Unpublished PhD Thesis, Manchester Polytechnic, 1991), p.77.

³⁵⁹ The Logan Muckelt Collection, GB127.M831, 1880s-1960s, Manchester Archives.

³⁶⁰ Sykas, P. A., ‘Material Evidence: Nineteenth-Century Calico Printers’ Pattern Books’, (PhD Thesis, Manchester Metropolitan University, 2000), p.355.

³⁶¹ Farnie, D. A., *The English Cotton Industry and the World Market, 1815-1896* (Oxford: Clarendon Press, 1979), p.84.

³⁶² Sykas, ‘Material Evidence’, p.369; Chapman, S. D., *Merchants Enterprise in Britain from the Industrial Revolution to World War I* (Cambridge: Cambridge University Press, 1992), p.63.

³⁶³ *Slater’s Directory of Manchester and Salford 1879* (Manchester: Issac Slater, 1879); *Slater’s Manchester, Salford and Suburban Directory 1911* (Manchester: Slater’s Directory Ltd., 1911).

³⁶⁴ Kirby, M. W., *The Decline of British Economic Power since 1870* (London: Allen & Unwin, 1981), p.8; Landes, David S., *The Unbound Prometheus: Technical Change and Industrial Development in Western Europe from 1750 to the Present* (New York and Cambridge: Cambridge University Press, 2003), p.337.

reveals a much more nuanced picture. In the case of the West African market an analysis of design specialization is useful in understanding the relationship between the extent to which manufacturers catered designs for particular markets and market growth. Export figures indicate that the textile trade with West Africa grew as a percentage of overall trade from 5 per cent in 1856 to 9 per cent in 1913, almost equal to the Americas.³⁶⁵

The survival of numerous pattern books from the firm of Logan Muckelt & Co., manufacturers for the West African markets, allows for a micro-analysis of the designs produced by one firm over a thirty-year period. The samples from the Logan Muckelt collection illustrate that British manufacturers had knowledge of West African cultures and design traditions. However, they also demonstrate that while British manufacturers imitated particular elements of African textile design, they did not simply create reproductions of locally made West African cloth. Material evidence shows that British manufacturers were combining Western traditions of textile design with elements of West African visual culture.

The Pattern Books: An analysis of design specialization

The analysis of the textile samples is here approached in two ways. Firstly, a database of 4,000 individual samples has been compiled from the two collections. This database charts the characteristics of textile design, including the colours used, the subject of the motif (including flora, fauna, geometric, abstract and symbolic), pattern repeats and if and when the pattern was 'turned off'.³⁶⁶ These allow for the identification of common design characteristics. Secondly, a sample of designs has been subjected to object-analysis with a detailed study of the production techniques, the use of colour and the style of motif. These designs were chosen for examination because they were either representative of the overall collection or because they broke from this model.

The pattern books within the Logan Muckelt collection can be divided into two categories. The first group includes those which consist of series of mainly indigo patterns, often containing numerous samples based on the same design presented in multiple colour variations and with different backgrounds: 9 of the 14 books dating from the 1880s to 1914 belong to this category, accounting for around 3,000 individual samples (figure 1). Those belonging to the second group are different in character, each book having a unique and distinct style. There is almost no pattern repetition and no alternative colour variations are included. These designs are strikingly different from the majority of the patterns found in the collection and do not adhere to many of the common design practices of the period, such as pattern layering and variation.

One of the most striking characteristics of the samples surveyed is the frequent use of indigo. While it may not be surprising to find that indigo features frequently in designs for West Africa, in almost 70 per cent of all the Logan Muckelt designs indigo is the predominant colour. However, indigo was used for the background colour, rather than the motif. Of the 14 Logan Muckelt pattern books only one does not contain any indigo grounds, while few make use of the colour in the rest of the design. The textile samples indicate that indigo was the staple colour for designs for West Africa throughout the period of this study.

Notably there seems to be little change in the way that indigo was used by these manufacturers of goods for West Africa over the course of the second half of the nineteenth and early twentieth centuries despite the introduction of a synthetic alternative. As synthetic dyes became available from 1856 with the introduction of coal-tar dyes, a man-made substance for indigo was not developed until 1897.³⁶⁷ Yet, within the Logan Muckelt

³⁶⁵ Redford, Arthur, *Manchester Merchants and Foreign Trade, Vol. II 1850-1939*, (Manchester: Manchester University Press, 1956), p.60, p.75 & p.90.

³⁶⁶ 'Turning off' refers to the process through which designs engraved onto copper printing rollers were removed, meaning the roller could be re-engraved with a new design.

³⁶⁷ Mellor, C. M. and Cardwell, D. S. L., 'Dyes and Dyeing 1775-1860', *The British Journal for the History of Science* 1/3 (1963), pp.265-279, p.277.

collection there is no evidence in the textile samples of the change from natural to synthetic indigo around this date and unfortunately no written records to indicate whether and when the firm made the change.

While indigo is consistently a key feature of the designs surveyed other production techniques which are associated with West African textile consumption are less visible in the archives. Resist dyeing methods were popular in West African communities both as local traditions and through the importation of Indian and Indonesian textiles.³⁶⁸ The decorative effects achieved by these methods became central to West African textile preferences and consumption patterns, particularly in terms of wax-resist prints.³⁶⁹ Although these methods are not wholly absent from the archives, the evidence indicates that roller and block printing were still the preferred methods of production for British manufacturers of goods for West Africa. Of the samples analysed less than 10 per cent can be seen to imitate batik and tie-dye methods.

A dearth of knowledge may have been responsible for the reluctance to imitate these techniques. The methods for imitating wax-resist methods used successfully by Dutch manufacturers did not become known to British printers until the beginning of the twentieth century.³⁷⁰ Processes for applying wax with printing blocks were developed in the 1880s and evidence indicates that designs produced using these methods were exported to Africa from 1893.³⁷¹ The Logan Muckelt samples also indicate that British manufacturers were experimenting with other ways of imitating the “cracked” effect created in the batik process. The samples indicate that manufacturers were using common printing techniques, such as engraved rollers, to try and imitate batik effects (figure 2). However, to the trained eye and to the eye of the West African consumer these would be obvious imitations.

Other samples show similar attempts to represent “cracking” in different styles, with varying levels of success. Geert Verbong has argued that the cracked effect associated with wax-resist prints was not a desired result of the process.³⁷² However, as European manufacturers gained an increasing share of the market this cracked effect became a fundamental characteristic of wax prints.³⁷³ Nonetheless, these imitation designs only account for a very small percentage of the total designs, the majority of which are the product of the roller and block printing techniques.

Another noticeable feature is poor design registration. Print registration refers to the accuracy with which the different colours printed onto the fabric line up as they are applied by different rollers or blocks. Poor registration can be seen, for instance, when areas of colour extend beyond or do not fully fill the boundaries of shapes. In the early years of mechanization poor design registration was a common problem. However, by the second half of the nineteenth century highly accurate registration could be achieved and the majority of the Logan Muckelt patterns are testament to this. Pattern Book 114 contains numerous examples of inaccurate registration (figure 3).³⁷⁴ The pattern books in this collection were most likely factory copies, used as reference material for the manufacturing process and not as

³⁶⁸ Krieger, Colleen, *Cloth in West African History*, (Oxford: Altamira Press, 2006), p.3; Keyes Adenaike, Carolyn, ‘West African Textiles, 1500-1800’, in Fennell Mazzaoui, Maureen (ed.) *Textiles: Production, Trade and Demand*, (Aldershot: Ashgate Publishing Ltd., 1998), pp.251-261, p.255.

³⁶⁹ Barber, Karin and Newell, Stephanie, ‘Speaking Out: Dissent and Creativity in the Colonial Ear and Beyond’ in Casely-Heyford, Gus, Topp Fargion, Janet and Wallace, Marion (eds), *West Africa: Word, Symbol, Song* (London: British Library, 2015), p.119.

³⁷⁰ Sykas, Philip A., *The Secret Life of Textiles: Six Pattern Book Archives in North West England* (Bolton: Bolton Museums, Art Gallery and Aquarium, 2005), p.28.

³⁷¹ Pedler, Frederick, *The Lion and the Unicorn in Africa: The United Africa Company 1787-1931*, (London: Heinemann, 1974), p.242.

³⁷² Geert Verbong, ‘The Dutch Calico Printing Industry between 1800 and 1875’, in Robert Fox & Agusti Nieto-Galan (eds), *Natural Dyestuffs and Industrial Culture in Europe, 1750-1880*, (Canton, Mass.: Science History Publications, 1999), pp.193-218, p.208.

³⁷³ *Ibid.*, p.215.

³⁷⁴ Logan Muckelt Pattern Book No. 114, GB127.M831/114, c.1890-1905, Manchester Archives.

sales books intended to showcase the firm's designs to potential buyers. Consequently, the samples found in these pattern books could be preliminary prints made before the registration process was perfected. Yet, as this is the only pattern book in the collection to display this low level of print registration this seems unlikely. It is instead probable that this was a design choice which aimed to imitate the inaccuracies of hand-production. This is a trend in wax-prints for West Africa which Geert Verbong has also located amongst Dutch manufacturers.³⁷⁵ With the introduction of the lime resist method for imitating the batik effect, supplementary colours were added by hand leading to inevitable inaccuracies in the print registration.³⁷⁶ Verbong contends that these irregularities were appreciated by African consumers as they were evidence of the hand-crafted nature of the cloth.³⁷⁷ It is probable that the Logan Muckelt patterns are attempting to imitate this trend by purposely affecting poor print registration in an effort to respond to apparent market demands and compete with Dutch goods.

The designs within the Logan Muckelt collection show a wide range of motifs and styles, many of which are clearly designed specifically for the West African markets, drawing on symbols and styles popular in West African communities. For instance, a comb depicted in a sample dating from the late nineteenth century alludes to the 'duafe' which for the Ashanti people can represent femininity, love and care and looking after one's appearance.³⁷⁸ The manila is another common image used in designs for West Africa. A form of currency usually made of bronze or copper used in West African trade, the distinctive shape of the manila would have been familiar to West African and British traders and merchants.

However, alongside designs which have a clear influence from West African cultures there are many abstract and geometrical designs which have no obvious influence from West African design. The material evidence illustrates that designs produced for the West African markets followed many of the design practices common in the textile printing industry. For instance, a variety of colour combinations are presented for each design. One design, featuring an octopus, appears in 65 different permutations. This was common practice in the calico printing industry for the domestic market; these pattern books demonstrate that these same practices were also used for export. The variation of designs was one strategy used by British manufacturers of printed textiles to reduce costs and maximize potential profits while offering the consumer a wide selection.³⁷⁹ The application of this practice for the export market, indicates that manufacturers either saw variation as equally important for the export market or demonstrated a lack of sensitivity to the potential differences of the export market, relying on traditional design mechanisms rather than adapting their design and manufacturing techniques to suit foreign markets. Furthermore, although there are elements of West African cultures and design seen in the samples, these textiles do not on the whole imitate West African textiles or the popular imported textiles of India and Indonesia. The textile samples indicate that British manufacturers were not drawing from West African textile traditions but rather combined Western calico printing traditions with aspects of West African culture.

A preliminary analysis of these textile samples generates two hypotheses for the design process. The first is that manufacturers and designers had some knowledge of West African design and tastes but this was limited and inconsistent. This partial knowledge resulted in the production of designs which included elements of West African cultures but ultimately failed to comprehend the subtleties in these textile traditions. The second hypothesis is that manufacturers made a conscious decision to not directly imitate traditional

³⁷⁵ Verbong, 'The Dutch Calico Printing Industry', p.215

³⁷⁶ Ibid., p.215.

³⁷⁷ Ibid., p.215.

³⁷⁸ Willis, W. B., *The Adinkra Dictionary: A Visual Primer on the Language of Adinkra* (Washington D.C.: Pyramid Complex, 1998), p.189; Sykas, *The Secret Life of Textiles*, p.30.

³⁷⁹ Pevsner, Nicholas, *Pioneers of Modern Design: From William Morris to Walter Gropius*, (London: Penguin Books, 1991), p.42.

West African textiles. British manufacturers instead attempted to combine British printing technology with elements of West African design. In this way, they did not need to compete directly with local cloth.

Overall the pattern books demonstrate that Logan Muckelt did attempt to cater their designs to the West African markets adapting designs, with symbols, colour and effects such as imitation batik, in an attempt to secure and maintain a market share in West Africa. However, this was limited and design and manufacture for the West African market was based on the same fundamental practices as for the domestic market. The pattern books suggest that, alongside market specialization, manufacturers considered variety to be an efficient way to maximize sales while minimizing costs.

Figure 1: *Logan Muckelt Pattern Book, GB127.M831/55, c.1899, Manchester Archives*



Figure 2: *Logan Muckelt Pattern Book*, GB127.M831/114, c.1890-1905, Manchester Archives



Figure 3: *Logan Muckelt Pattern Book*, GB127.M831/114, c.1890-1905, Manchester Archives



Secrets for sale? Innovation and the nature of knowledge in an early industrial district: The North Staffordshire Potteries, 1750-1851

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Introduction

Although it was not one of the more traditional lead sectors of the industrial economy during the eighteenth and nineteenth centuries, pottery production in North Staffordshire *is* an example of a ‘classic’ industrial district. It warrants particularly close study because unlike other districts the Potteries did not experience the ‘terminal’ phase of its lifecycle until the close of the twentieth century.³⁸⁰ For more than 250 years the region hosted a highly innovative industry in which science and knowledge-intensive activity featured heavily.

By 1750 the pottery industry was heavily concentrated in the Potteries with pot shops and firing ovens crowded together often just feet apart. Such proximity promotes face-to-face contact between individuals which is particularly important in ‘creative’ industries where tacit knowledge looms large.³⁸¹ In sites of intensive material production, however, it also creates tensions between knowledge transfer and the need to retain competitive advantage. Pottery production continued to be dominated by craft-based processes and the skills of the Master Potters until well into the second half of the nineteenth century; reliable automated machinery was in general use only by the 1870s.³⁸² Practising pottery before this required an enormous amount of knowledge, skill and ‘ingenious manual labour’, much of which was extremely difficult to articulate or express explicitly.³⁸³

Figure 1 shows an advertisement for the sale or letting of a pottery manufactory, which ran for several weeks in 1795 in the *Staffordshire Advertiser*, and offers a perspective from which to examine these tensions and knowledge. It suggests several features of production in the Potteries: networks and connections mattered; ‘important secrets’ of the trade could be acquired either through ‘expensive Experiment’, or purchased for a ‘reasonable consideration’; producers could access an informal market for certain types of useful and reliable knowledge which were seen as providing competitive advantage in the industry.³⁸⁴

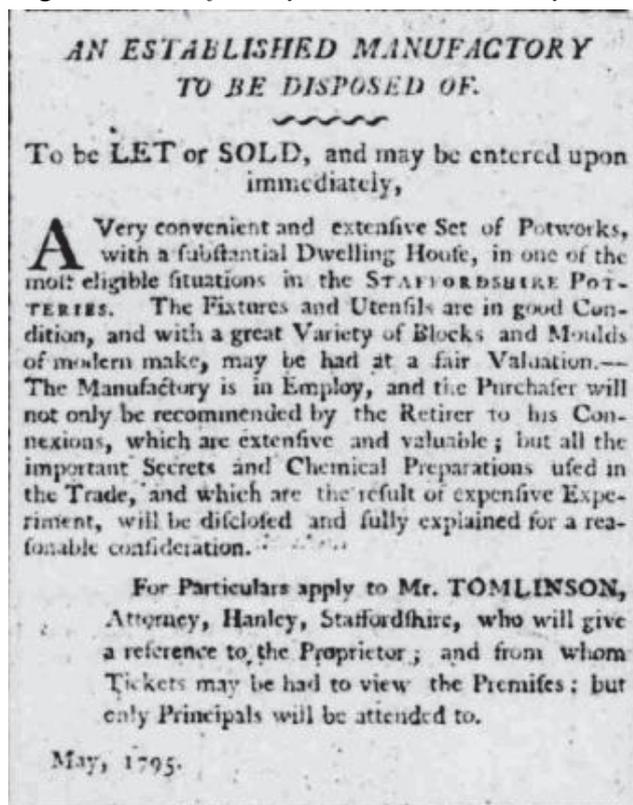
³⁸⁰ Andrew Popp and John F. Wilson, ‘Districts, networks and clusters in England: An introduction’, in Popp and Wilson (eds.) *Industrial Clusters and Regional Business Networks in England, 1750-1970* (Ashgate: Aldershot, 2003), pp.14-15

³⁸¹ Michael Storper and Anthony Venables, ‘Buzz: face-to-face contact and the urban economy’, *Journal of Economic Geography*, Vol. 4, No. 4 (2004), pp.351-370

³⁸² A. Lamb, ‘The Press and Labour Response to Pottery-making Machinery in the North Staffordshire Pottery Industry’, *Journal of Ceramic History*, Vol. 9 (1977), p.6.

³⁸³ Simon Schaffer, ‘Introduction’, in Lissa Roberts *et al* (eds.), *The mindful hand: Inquiry and invention from the late Renaissance to early industrialisation* (Edita KNAW: Amsterdam, 2007), p.315.

³⁸⁴ *Staffordshire Advertiser*, 16 May 1795.

Figure 1: *Manufactory Advertisement, May 1795*

Source: Staffordshire Advertiser

This paper investigates these features and explores the relationships between knowledge, innovation, and the behaviour of firms and producers in the English pottery industry during the eighteenth and nineteenth centuries. It presents and analyses a new database of 143 pottery patents and specifications for the period 1617-1851, and identifies distinct types of knowledge in the industry, and how differences between these led to a range of strategies on the part of producers to protect, share and appropriate the returns. Because innovation is ‘multidimensional’ it uses a range of additional indicators to explain the context in which the featured advertisement should be considered.³⁸⁵

I. Patenting in the pottery industry

Unlike the general trend at the national level, which saw patenting in England take off from around 1750, the volume of patents in the pottery industry was extremely low.³⁸⁶ There were 143 pottery related patents granted 1617-1851.³⁸⁷ After reading the specifications, 35 of these were either incorrectly or only speculatively referenced as pottery related, leaving 108 genuine pottery patents. Figure 2 presents the frequency of those pottery patents granted in England, 1720-1851. Patenting was minimal until 1839 when repeated attempts to mechanize were made by John Ridgway and George Wall amongst others.³⁸⁸ Table 1 also shows the pottery patent data alongside those for the brewing industry, a similarly highly innovative industry which demonstrated a ‘remarkably low propensity to patent’.³⁸⁹

³⁸⁵ Keith Smith, ‘Measuring Innovation’ in J. Fagerberg and D. Mowery (eds.) *The Oxford Handbook of Innovation* (Oxford University Press: Oxford, 2006), p.149.

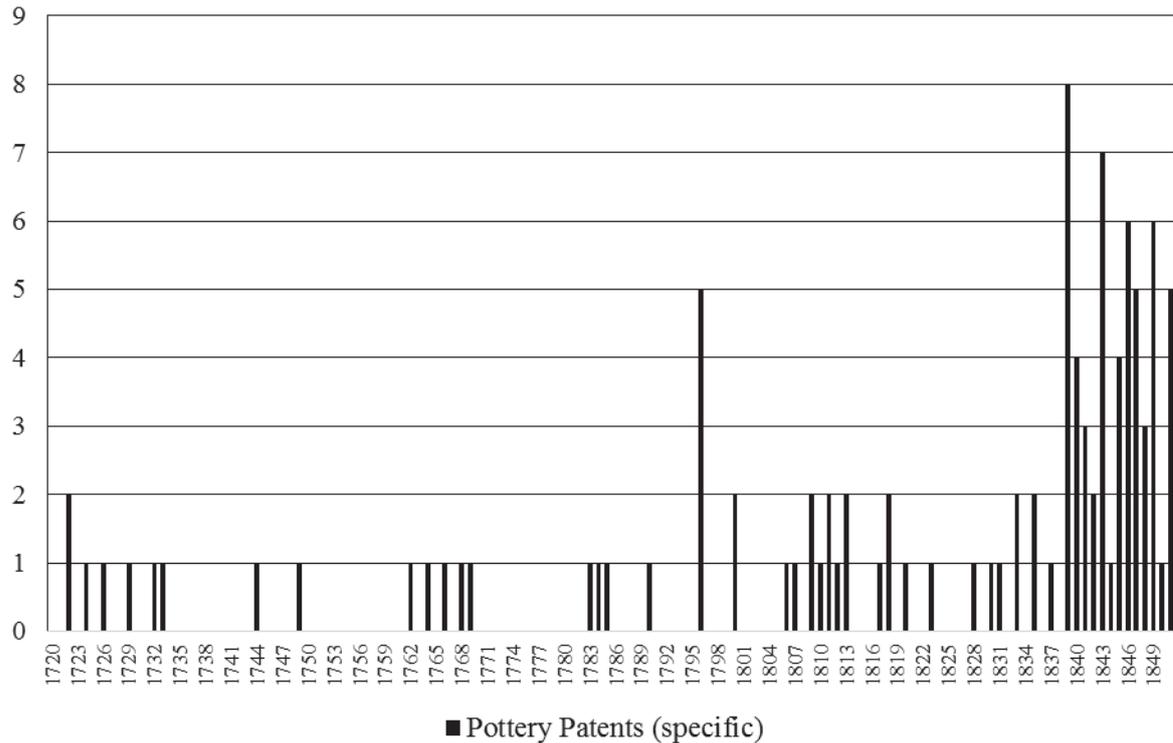
³⁸⁶ For total patent counts for England, 1617-1851 see: Richard J. Sullivan, ‘England’s “Age of Invention”: The Acceleration of Patents and Patentable Invention during the Industrial Revolution’, *Explorations in Economic History*, Vol. 26, No. 4 (1989), p.425.

³⁸⁷ Bennet Woodcroft, *Patents for Invention: Abridgements of the Specifications relating to Pottery* (Patent Office: London, 1863).

³⁸⁸ *Ibid.* see patents 8338-40; 9901; 11912.

³⁸⁹ Alessandro Nuvolari and James Sumner, ‘Inventors, Patents, and Inventive Activities in the English Brewing

Figure 2: Number of pottery related patents granted in England, 1720-1851



■ Pottery Patents (specific)

Sources: see fn. 388

Table 1: Brewing and pottery patents, 1751-1850

Years	1751-1800	1801-1850	1751-1850
Total patents	1,804	10,974	12,778
‘Genuine’ brewing patents	21	62	83
Brewing share of total	1.16%	0.56%	0.65%
‘Genuine’ Pottery patents	16	73	89
Pottery share of total	0.89%	0.67%	0.70%

Sources: see fn. 388 and 390

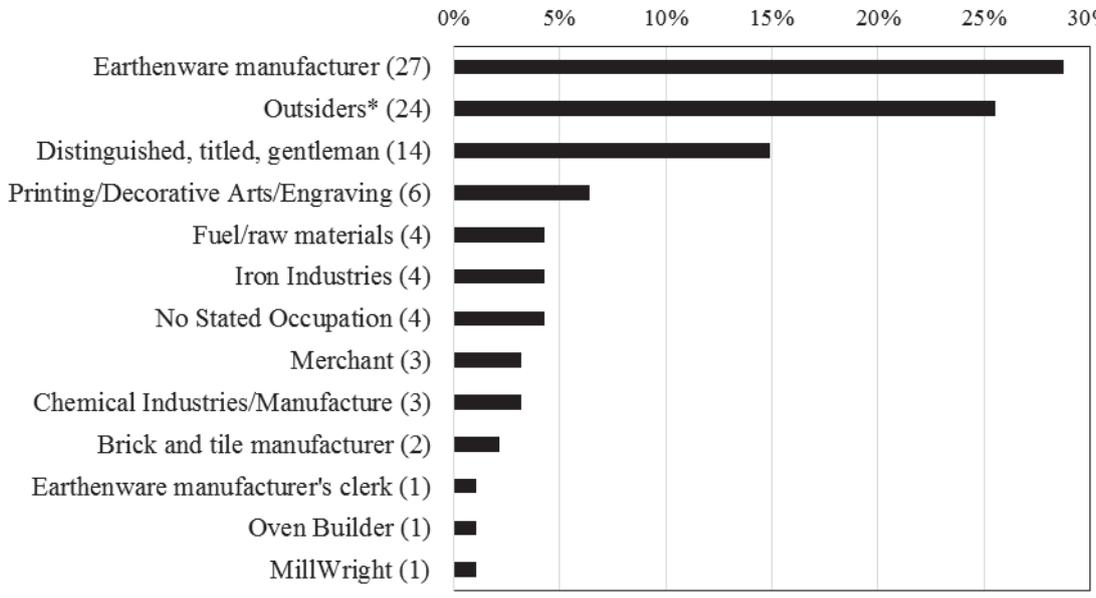
These data beg the questions: who were these few patentees? What were they patenting? To answer the first question, figure 3 shows the occupational distribution and figure 4 shows the geographical distribution at the county level in 1851 of pottery patentees for our period. Clearly, the few patents that were granted were not restricted to potters. Whilst earthenware manufacturers accounted for the largest single group, 71 per cent of patents were held by ‘outsiders’ to the industry such as engineers, the upper societal elite, and builders, the majority of whom were not resident in Staffordshire. Whilst this is a new finding and an addition to the available empirical evidence, it is not a phenomenon unique to the pottery industry by any means. To continue an earlier comparison, a quarter of all brewing patents for the same period were also held by ‘outsiders’.³⁹⁰ Figure 4 shows that geography of pottery patenting was complex and concentrated in Staffordshire and London which reflects the local concentration of the industry. Indeed, there was only one pottery patentee located in Staffordshire who was not resident in the Potteries district. However, the absolute numbers for the district were low compared to those outside. When the perspective is shifted to that of the outsiders to the industry and region, these patents were located in regions heavily involved in other industries such as Yorkshire, Lancashire, Cornwall and Northumberland. This shows,

Industry, 1634-1850’, *Business History Review*, No. 87 (Spring 2013), pp.95-120

³⁹⁰ Ibid.

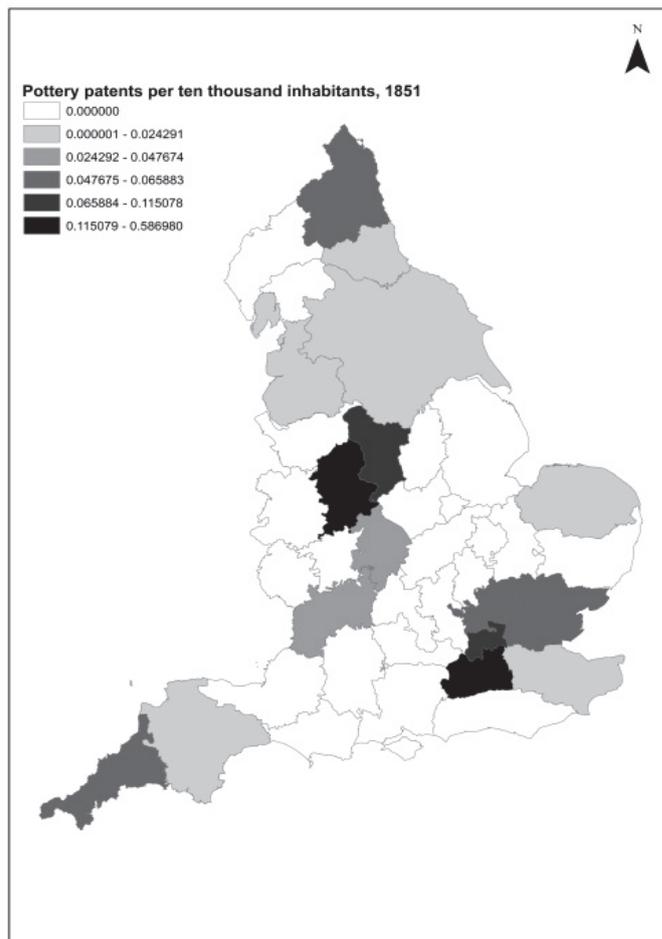
therefore, that the low propensity to patent a pottery innovation was exhibited at the industry level, rather than the regional level.

Figure 3: Pottery patentees by occupation, 1750-1851 (absolute numbers in parentheses)



Source: see fn. 388

Figure 4: Pottery patents per 10,000 inhabitants, 1851



Source: see fn. 388

To answer the second question we must turn to the specifications of the patents themselves. The 108 pottery patents have been categorized into the self-explanatory following groups: process (59 per cent), product (12 per cent), recipe (9 per cent), raw material (8 per cent), and ancillary (12 per cent). Pottery patents were thus dominated by process innovations such as John Pepper's improved kiln construction of 1796 to reduce fuel consumption, or the aforementioned attempts to mechanize production.³⁹¹ Product innovations such as William Cookworthy's English porcelain, or the garden pots of Cutten and Brown were uncommon.³⁹² Some of the innovations such as these were largely based on explicit practical knowledge rather than tacit scientific knowledge.

This was not true of all patents however. Thomas Frye submitted a patent for porcelain in 1749 which was extremely vague to the point of absurdity. A close reading of the specification reveals that almost any combination of a large list of ingredients would render 'a certain ware'. No amount of tacit understanding could decipher the recipe and this was most likely a deliberate attempt to obscure details and grant protection to the use of and experiment with the materials listed.³⁹³ It is possible that this patent was being used to protect knowledge which had not been fully articulated even in the head of Frye himself. Similarly, in April 1835 a Staffordshire potter, Godwin Embrey, obtained a patent for a decorative gold lustre recipe which was met with much criticism for much the same reasons as Frye's. The *London Journal* provided an account of the specification which 'appears [...] to possess but a very slight degree of novelty' and questioned whether there was actually any new information or knowledge in the supposed innovation.³⁹⁴ In contrast, Josiah Wedgwood's patent for his complex encaustic decoration granted in 1769 included a detailed list of the weights, measures, and description of the process required although it was not quite a 'how-to' guide to re-creating the innovation.³⁹⁵ A comprehensive patent was also granted in December 1839 for Henry Trewhitt's flatware machine.³⁹⁶ This extremely detailed specification was accompanied by an annotated diagram and notes on the materials each piece should ideally be made from (copper, iron, etc.). From a technical perspective, there is no reason to believe that someone with experience would not be able to reproduce the machine although it does not reveal any more information than could be gleaned by seeing the machine in person.

These specifications highlight the differences between patents based on the types of knowledge they are protected and the degree to which they can be reverse-engineered. The detailed patent offered potential readers a large amount of information and detail and the chance to replicate the innovation. The knowledge here was prescriptive mechanical knowledge and explicated by its embodiment in a tangible object and defensible through the patent system. The vague, abstract and occasionally incomprehensible patent offered little valuable information to a reader and often only signified that some sort of innovation had occurred. The potential knowledge behind these innovations was clearly extremely valuable. A certain degree of this scientific and chemical based knowledge was explicable, in the sense that quantities and procedures *could* be written down. However, much of the most valuable information was kept secret. The other component of this type of knowledge was the tacit element driven underscored by Polanyi's dictum 'we know more than we can tell'.³⁹⁷

So, why, in general, didn't potters patent their innovations? MacLeod argues that the lack of a suitable legal framework including design copyrights until the 1840s may explain much of this.³⁹⁸ However, given the importance of tacit and uncodified knowledge in pottery

³⁹¹ See patents 2140 and those listed in fn. 388: Woodcroft, *Patents for Invention*.

³⁹² See patents 898, 8254, 9518: Ibid.

³⁹³ See patent 649: Ibid.

³⁹⁴ *The London Journal of Arts and Sciences: and Repertory of Patent Inventions*, Vol. 13 (W. Newton: London, 1839), pp.22-3.

³⁹⁵ See patent 939: Woodcroft, *Patents for Invention*.

³⁹⁶ See patent 8295: Ibid.

³⁹⁷ Michael Polanyi, *The Tacit Dimension* (Peter Smith: Gloucester, Mass, 1983), pp.4-10.

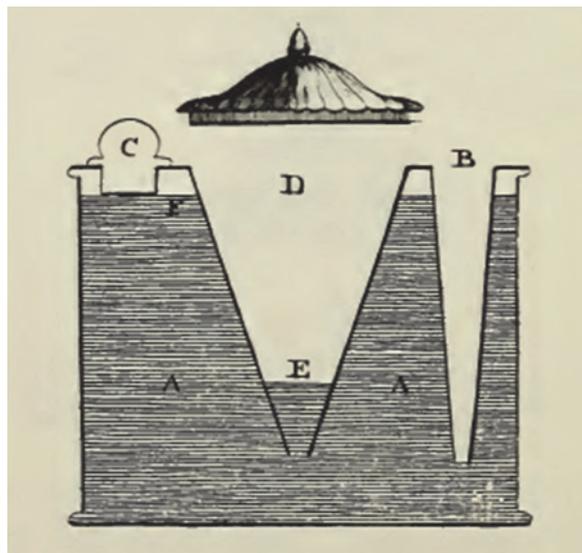
³⁹⁸ Christine MacLeod, *Inventing the Industrial Revolution; The English Patent System, 1660-1800*, (Cambridge

production as shown by the analysis of patents, and the lack of widespread mechanization, any explanation based solely on legislation is not sufficient. If we accept Moser's argument concerning the level of knowledge in an industry influencing the propensity to patent, we must engage with further evidence of innovation outside the patent system.³⁹⁹

II. Knowledge and innovation outside the patent system

Award citations for the Great Exhibition of 1851 suggest that novelty in innovation in the pottery industry relied on knowledge-intensive efforts in scientific and chemical based processes such as glazes, colours and body compositions.⁴⁰⁰ This knowledge was protected by virtue of the irreversible chemical reactions undergone during firing which rendered innovation somewhat elusive and difficult, if not impossible, to reverse-engineer. Such innovations could therefore remain protected without formal patents in place. Moreover, some key innovations were recognized in other ways such as the 'Large Gold Medal' awarded by *The Society of Arts* to Job Meigh in 1822 for his lead-free glaze. The receipt of such an award often prohibited attempts by a potter to 'monopolize to himself the advantages which may arise from his discovery'.⁴⁰¹ On this, and other, occasions, the knowledge and secrets which may have been appropriated were, by order of the *Society* published and 'freely given up to the public'.⁴⁰²

Image 1: Wedgwood's black basalt ink-stand, advertised in his product catalogue of 1787



Source: *The Wedgwood Catalogue of 1787* (The Wedgwood Society of New York: New York, 1980)

Sales catalogues are also an excellent supplementary source to examine knowledge and innovation. Josiah Wedgwood went to considerable lengths to illuminate the originality and innovation of a few choice pieces in his 1787 catalogue. For example, his new basalt black ink stand was highly prized and the entry contained an annotated technical drawing shown in figure 5 which detailed the innovative aperture above all. These design properties could easily be obtained by purchasing the item and 'reverse-engineered'. The secret chemical composition of the black basalt body, however, the most crucial innovation as it did not corrode, colour or absorb the ink, remained intangible. Again, we have two types of knowledge: secret scientific knowledge which formed the basis of key innovations, and visual

University Press: Cambridge, 1988).

³⁹⁹ Petra Moser, 'Why don't inventors patent?' *NBER Working Paper*, No. 13294 (Aug. 2007).

⁴⁰⁰ *First Report of the Commissioners for the Exhibition of 1851* (London, 1852).

⁴⁰¹ *Mechanics' Magazine*, 31 Jan. 1824, p.366

⁴⁰² *Transactions of the Society, Instituted at London*, Vol. 40, 1823, pp.vii-ix.

or tangible elements of design which were easily obtainable. Wedgwood appears, here, to have relieved the tensions between disclosure and secrecy with great effect.

A final point to highlight the importance of secret, scientifically focused knowledge can be found in an exchange in *Mechanics' Magazine* over several months in 1833. A contributor under the alias of 'Friar Bacon of Hulton Abbey' had published in March 1833 108 annotated recipes for glazes, one of *the* defining components of pottery ware and thus extremely valuable.⁴⁰³ These were far more detailed than those listed in patent specifications and, according to one reader, had 'put all in commotion', although not so much as to prevent him from requesting further recipes, a sign that they were indeed useful and worked.⁴⁰⁴ Clearly, then, whilst there were some moral and ethical issues raised, the pragmatic reader recognized the importance of the knowledge. The *Magazine* obliged and a further 67 recipes were published under the title 'More Pottery Secrets' in July of that year.⁴⁰⁵ This offered readers a rare opportunity to obtain the secrets of the trade for virtually nothing, without the need to purchase or rent a whole manufactory. This industry was clearly one in which secrecy was a possibility, and, given the evidence above, was preferred to more formal forms of appropriation.

III. Conclusion

The summary of findings presented here concludes that the nature of knowledge was extremely important in determining the behaviour of producers with regards to articulating and disseminating knowledge. Firstly, the paper finds there was an extremely low propensity to patent despite high levels of innovation. Much of the innovative activity during this period was conducted outside of the patent system. Indeed, it was far more common for an 'outsider' to the industry to patent a pottery innovation. Secondly, it constructs a more complex typology of knowledge in the industry than a simple tacit/explicit dichotomy and shows that Moser's assertions that the 'effectiveness of secrecy' was industry specific and underpinned by the nature of the knowledge required, also hold for the earlier period of 1750-1850.⁴⁰⁶ There was knowledge which was articulable and defensible in the formal sense which included mechanical or prescriptive knowledge which was relatively easy to decipher. There was also knowledge which could not be formally protected because it was difficult to fully articulate. Finally, there was knowledge which straddled the tacit and explicit distinctions. In its finished state as embodied in a piece of earthenware it was largely undecipherable except through extensive and expensive experimentation, with no guarantee of success. However, in its articulable form, the recipe or instruction manual, this knowledge was extremely useful to those with the experience and tacit knowledge to understand and apply it. Thus, it was deemed to be of such value to a potter that it was kept secret and passed on only at a price. Potters thus adopted different strategies toward protecting their knowledge depending on the type of knowledge it was.

⁴⁰³ *Mechanics' Magazine*, 31 March 1833.

⁴⁰⁴ *Ibid.* 29 June 1833.

⁴⁰⁵ *Ibid.* 20 July 1833.

⁴⁰⁶ Moser, 'Why don't inventors patent?'

The Ottawa Preference System and its impact on entrepreneurial activity in the British Empire: evidence from the colony of Cyprus

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Introduction

On 21st July 1932 Great Britain and her dependencies conveyed the Imperial Economic Conference in Ottawa in order to discuss measures for averting the consequences of the Great Depression, especially on the export trade of Great Britain and the dominions. With the new tariff policy the colonial raw materials shared a preferential advantage of 10 per cent ad valorem in their export to metropolis, while Great Britain gained wider preferential margins in the imperial markets for her industrial products.⁴⁰⁷ Historiography hitherto has focused on the effects of the Imperial Preference System in commerce and industry. Some scholars argue that the impact of tariff policy was rather disappointing for some parts of the Empire,⁴⁰⁸ while others suggest that it was effective.⁴⁰⁹ The paper will discuss the unexplored aspect of the positive impact of the Ottawa agreements on entrepreneurial activity in the British Empire. The paper draws on evidence from the Crown Colony of Cyprus in the eastern Mediterranean with emphasis on the story of a single exporting business venture.

In the 1930s protectionism was considered to be ineffectual for the Cyprus economy,⁴¹⁰ albeit its moderate beneficial effect on the wine industry and breweries.⁴¹¹ New research outputs show that a dire outcome of tariff policy was the attraction of foreign investment in the establishment of innovating export companies in the manufacturing and citrus industries.⁴¹² This interest emerged mainly from Jewish entrepreneurs in Palestine, who looked for new prospects within the imperial trade. Unlike Cyprus, Palestine remained outside the Imperial Preference System since she was a foreign country to Great Britain and therefore any grant of trading preferences to the Mandate would compel Great Britain to repeal the most-favoured-nation clause in treaties with other foreign countries.⁴¹³ The exclusion from the preferential area exposed Palestine's export trade with Britain to stiff competition with other Mediterranean producers and manufacturers. The Palestinian Jews preferred to search for new

⁴⁰⁷ For the Ottawa agreements see Tim Rooth, *British Protectionism and the International Economy: Overseas Commercial Policy in the 1930s* (Cambridge, 1993), 85-100; Forrest Capie, *Depression and Protectionism. Britain between the Wars* (London, 1983); David L. Glickman, 'The British Empire Preference System', *The Quarterly Journal of Economics*, 61 (1947), 439-470; Robert Boyce, 'The significance of 1931 for British Imperial and International History', *Histoire@Politique*, 11:2 (2010), 1-8.

⁴⁰⁸ See Charles P. Kindleberger, 'Commercial policy between the wars', in Peter Mathias and Sidney Pollard (eds.), *The Industrial Economies: The Development of Economic and Social Policies* (Cambridge, 1989); David S. Jacks, 'Defying gravity: The Imperial Economic Conference and the reorientation of Canadian trade', *Explorations in Economic History*, 53 (2014), 19-39.

⁴⁰⁹ See Glickman, *ibid.*; Edward A. Safarian, *The Canadian economy in the Great Depression* (Toronto, 1970); Edward Marcus, *Canada and the International Business Cycle, 1927-1939* (New York, 1954); Boyce, *ibid.*, 15; Toronto Feinstein and Temin Toniolo, *The World Economy Between the World Wars* (Oxford, 1997), 141-143. Also, Norman Miners, 'Industrial Development in the colonial empire and the imperial economic conference at Ottawa 1932', *The Journal of Imperial and Commonwealth History*, 30:2, 53-76.

⁴¹⁰ Alexander Apostolides, *Economic Growth or Continuing Stagnation? Estimating the GDP of Cyprus and Malta, 1921-1938*, PhD in Economic History (LSE, 2010), 147.

⁴¹¹ Frederick V. Meyer, *Britain's Colonies in World Trade* (London, 1948); Capie, *ibid.*, 32; Miners, *ibid.*, 55.

⁴¹² Evangelia Mathopoulou, *Jewish presence in British Cyprus, 1978-1949: ideological and socio-political transformations, entrepreneurship and innovation in a colonial setting*, PhD thesis, Department of History and Archaeology (University of Cyprus, 2016) (in Greek).

⁴¹³ Roza I. M. El- Eini, 'Trade Agreements and the continuation of tariff protection policy in Mandate Palestine in the 1930s', *Middle Eastern Studies*, 34:1 (1998), 183.

markets in order to tackle this major challenge.⁴¹⁴ Some businessmen who were trading with Great Britain decided to relocate their enterprises in the neighbouring British colony of Cyprus. Apart from the benefits of protectionism, Cyprus compared to Palestine was cheaper in cost of living, land prices and wages,⁴¹⁵ since the colony did not experience the unparalleled mass influx of population, labour and capital that provoked the rapid growth in Palestine in the late 1920s and early 1930s.⁴¹⁶

Thus, in the eastern Mediterranean protectionism spurred a capital and human capital transferral from the Mandate of Palestine to the colony of Cyprus⁴¹⁷ which particularly encouraged entrepreneurship in export trade. The Jewish entrepreneurs established companies in the port-towns of Larnaca, Limassol and Famagusta with a view to developing citrus production and manufacturing of industrial goods, which had an increasing demand in the British market. Their entrepreneurial activity within the preferential trading zone was pioneering; they opened up new prospects for the profitable citrus trade of the colony with Great Britain and paved the way for the modernization of local industry.⁴¹⁸

The case of the Dominion Manufacturing Co. Ltd

Within this context, a family of Jewish 'industrial migrants' established the Dominion Manufacturing Co. Ltd on the 17th of August 1936 with a capital of £3,000.⁴¹⁹ The company sought to take advantage of the fact that the import of buttons from a non-British territory, such as Italy and Japan, was liable to 33 per cent ad valorem duty, while the buttons from an imperial territory were exempt from import duty. The company was presented as the parent of 14 subsidiary companies in different parts of the world, such as London, Aden, Khartoum, Eritrea, Tel Aviv and Jamaica. The subsidiaries supplied the Dominion in Larnaca with raw materials and supported the distribution of buttons in the markets abroad. For marketing purposes in Great Britain the company founded the Overseas Supplies Ltd at Regent Street in London with a capital of £1,000.⁴²⁰

The familial networking of the Jewish Palestinian businessmen, as well as their established experience with the Cyprus business environment, was of catalytic importance in shaping Feinsteins' decision to set up the company on the island. Raymond Feinstein was an already established entrepreneur on the colony when he decided to form the Dominion along with his brothers. In 1934 his father-in-law Simon Bloom, owner of the American Porcelain Tooth Co. in Tel Aviv, transferred his business venture in Larnaca with a view to taking advantage of the Ottawa trading zone, founding the Empire Dental Industry Ltd for the export of artificial teeth to Western Europe.⁴²¹ Raymond Feinstein was the principal partner in the Empire Co. and had a substantial interest in Bloom's company in Tel Aviv.⁴²²

The colonial government facilitated the operation of the Dominion. The existence of an exporting firm was expected to have a positive impact on the local economy, creating new jobs during a period of high unemployment rates on the island. Also, it was likely to prompt local industrial activity and develop the island's steamship connections especially with Great

⁴¹⁴ *Ibid.*, 185.

⁴¹⁵ David De Vries, 'From Porcelain to Plastic: Politics and Business in a Relocated False Teeth Company, 1880s-1950s', *Enterprise and Society*, 14:1 (2012), 163; For a detailed estimation, see Mathopoulou, *ibid.*, 75-76.

⁴¹⁶ Jacob Metzger, *The Divided Economy of Mandatory Palestine* (Cambridge, 1998), 16-24.

⁴¹⁷ De Vries, *ibid.*, was the first to refer to a 'capital relocation' from Palestine to Cyprus in the 1930s.

⁴¹⁸ See 'Pioneers in a stagnant economy: the Jews in British Cyprus, 1899-1939', in Giorgos Kazamias and Giorgos Antoniou (eds.), *Historical Perspectives on Cypriot-Jewish Relations* (Nicosia, 2015), 28-49.

⁴¹⁹ State Archives of the Republic of Cyprus (hereafter SA): SA1/871/1938, Wright to MacDonald, 12.8.1938.

⁴²⁰ *Ibid.*

⁴²¹ For an overview of Blooms' and Feinstein's business activities in Palestine and Cyprus see De Vries, *ibid.*, 159, 163.

⁴²² SA: SA1/871/1938, *ibid.*

Britain.⁴²³ In December 1936, following a petition by R. Feinstein, the government ordered that the raw materials imported in Cyprus for the purpose of button manufacturing and export would be exempted from duty, provided that this material was produced and exported from a British territory.⁴²⁴ Under the provisions of an Order in Council, the Comptroller of Customs accorded exemption from import duty to dom nuts from the Anglo-Egyptian Sudan, which was not regarded as a part of the British Empire, ‘for the reasons that they were not obtainable locally and that the kind of dom nuts most suitable for the manufacture of button was not obtainable in the British Empire’. Moreover, the company imported apple nuts from the Solomon Islands in the Pacific Ocean and corozo ivory nut from Ecuador in South America.⁴²⁵ Additionally, the buttons imported into Great Britain were eligible for preferential tariffs if at least 50 per cent of their value was derived from materials grown or produced or from work done within the British Empire.⁴²⁶ Up to the Second World War the slicing, facing, drilling and polishing work was undertaken wholly in Cyprus. By 1943 the company imported dom nut blanks which were faced, drilled and polished in Larnaca.⁴²⁷

Lacking the existence of a developed button industry in imperial territory, the Jewish company sought to monopolize the production of buttons in Cyprus, albeit without success. In 1938 another company, the Cyprus Button Co. Ltd, was established in Limassol by a joint venture of Greek and Cypriot capital.⁴²⁸ The operation of both factories within protectionism had as a result the creation of a new industrial product, while the range of Cypriot export products to Great Britain was extended (figure 1).

Figure 1: *Exports of buttons from Cyprus (gross), 1941-47*



Sources: SA: SA1/476/1942, Stanley to Woolley, 18.5.1942; *Cyprus Blue Books*, 1943-47.

The rise and fall of Dominion Co.

During the first years of its operation, the industry manufactured 100,000 buttons for men’s clothes on a daily basis.⁴²⁹ In November 1938, the company attempted to open up to the markets of Canada, South Africa, Australia, New Zealand, India and Burma urging the

⁴²³ SA: SA1/1327/1938, Palmer to MacDonald, 10.2.1939.

⁴²⁴ SA: SA1/ 1659/36, Palmer to Ormsby-Gore, 12.8.1937. Also, SA1/1659/36, Order in Council No. 1722 made under the Customs Law, 1936, 21.12.1936.

⁴²⁵ SA: SA1/1327/1938, Comptroller of Customs to Colonial Secretary, 9.4.1941 and Commissioner of Larnaca to Colonial Secretary, 11.12.1945.

⁴²⁶ SA: SA1/452/1938, Colonial Secretary to Mahrous, 15.2.1938.

⁴²⁷ SA: SA1/1113/1936, Feinstein to Comptroller of Customs, 26.6.1943 and Chapiro to Colonial Secretary, 16.11.1944.

⁴²⁸ SA: SA1/1659/1936, Galanides to Colonial Secretary, 6.8.1937.

⁴²⁹ *Kypriakos Phylax*, 16.3.1938.

Cyprus government to introduce the men's buttons in the catalogue of the Cypriot products exported to the dominions and other parts of the empire. By early 1939 the buttons were included in the catalogue of Cypriot products which enjoyed tariff reductions within the Empire and the dominions, except for Australia.⁴³⁰ This development satisfied the main goal of the company of advancing in the trade of buttons within the Empire, competing with the Italian and Japanese firms.⁴³¹

With the outbreak of the Second World War, the company showed high returns. This development came along with the operation of the Middle East Supply Centre in Cairo, which was created by Great Britain in April 1941 for the control and supply of agricultural and industrial production in the region.⁴³² The total production of the industrial plant in Larnaca was required for military garments and utility clothing and thus passed under the control of the Middle East Supply Centre.⁴³³ During war, the company exported buttons mainly to Great Britain, but also to the Middle East, East Africa, Palestine and India.⁴³⁴ In addition, the Board of Trade in Great Britain provided free licences for the import of buttons from Cyprus, requesting the entire quantity of buttons manufactured by the Dominion.⁴³⁵ By 1941 one million gross of buttons (144 million pieces in total) were exported from Cyprus to Great Britain, of which 550,000 gross (more than 79 million pieces) were manufactured by the Jewish company.⁴³⁶

The impact of war on the capacity of the factory was remarkable. Amidst the military operations in 1942 and while tons of imported raw material from Sudan and Ecuador was rising,⁴³⁷ the factory employed 860 workers, mainly women. The company appeared to have rocketed its profits and declared large dividends, which were kept for two to three years as high as 18 per cent on the nominal value of the shares.⁴³⁸

The revenues, however, were of temporary character. In 1944/5 the company's profits fell from £45,707 to £15,734. For the first time since its establishment, the company marked a loss amounted at £13,533 in 1947 and £24,132 in 1948 (figure 3). As late as 1947 it was obvious that the company could not pay its debts.⁴³⁹ The aftermath of the war actually revealed the fragile position of the export enterprise founded within protectionism and its exposure on competition triggered from postwar technological advances and emerging global markets. As early as 1944 plastic buttons gained ground within the world market. In order to overcome the reduced demand in domestic products and tackle the competition of the plastic ones, the owners decided to develop a new style of buttons and open up to the United States market.⁴⁴⁰ They requested, and were granted, exemption from the duty on unfaced mother of pearl blanks from Eritrea,⁴⁴¹ despite the fact that it was a semi-manufactured material, that is contrary to the Ottawa provisions.

⁴³⁰ SA: SA1/1327/1938, Note of Comptroller of Customs to Colonial Secretary, 12.1.1939.

⁴³¹ SA: SA1/1327/1938, Feinstein to Colonial Secretary, 4.11.1938 and Commissioner of Larnaca to Colonial Secretary, 31.12.1938.

⁴³² Martin W. Wilmington, *The Middle East Supply Centre* (Albany, 1971). Also, see D. P. E. "The Middle East Supply Centre: I—Organization and Functions", *Bulletin of International News*, 21:16 (1944), 619–625.

⁴³³ SA: SA1/1113/1936, Feinstein to Comptroller of Customs, 26.6.1943.

⁴³⁴ SA: SA1/1327/1938, Feinstein to Secretary of State for the Colonies, 10.12.1945. Also, SA1/637/1941, Acting Governor to Creech Jones, 24.11.1947.

⁴³⁵ SA: SA1/476/1942, Chapiro to Commissioner of Larnaca, 1.6.1942.

⁴³⁶ SA: SA1/476/1942, Stanley to Woolley, 18.5.1942.

⁴³⁷ SA: SA1/476/1942, Woolley to Stanley, 2.3.1942.

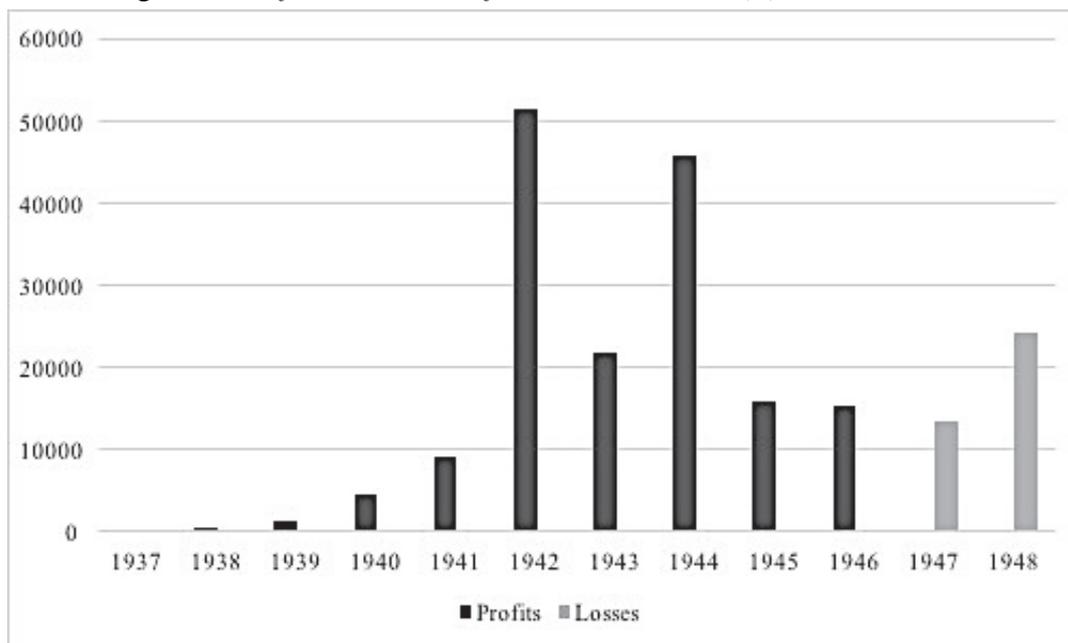
⁴³⁸ SA: SA1/1436/1949, Report of the Official Receiver delivered at the First Meeting of Creditors of the Dominion Manufacturing Co. Ltd (in Liquidation), 11.1.1950, 6.

⁴³⁹ SA: SA1/1436/1949, Report of the Official Receiver..., *ibid.*, 7.

⁴⁴⁰ SA: SA1/637/1941, J.E. Bell's minutes, 19.11.1947.

⁴⁴¹ SA: SA1/1113/36, Chapiro to Colonial Secretary, 16.11.1944; The Customs Law, 1936 to (No.2) 1944, 20.12.1944.

Figure 2: Profits and losses of the Dominion Co. (£), 1937-48



Source: SA: SA1/1436/1949, Official Receiver and Registrar to Colonial Secretary, 1.2.1950.

This tactic was fatal for the company, since it deprived its privileged access to the British market. By 1945 the company's products were excluded from the preference system on the ground that 50 per cent of the cost of production was not incurred in Cyprus.⁴⁴² The fact that the Overseas Supplies could not manage the shipments of buttons in the UK 'was detrimental' to the financial position of the company. The distributors could not ascertain whether the kinds and sizes of buttons were actually in demand by the British market⁴⁴³ and the stock, amounting to £170,000 by 1949, was hoarded at the Ionian Bank and Bank of Cyprus.⁴⁴⁴ Additionally, since 1947 the markets in East Africa, Palestine and India were seriously curtailed due to the outbreak of the balance of payment crisis, and foreign markets outside the British Commonwealth absorbed a negligible quantity of the factory's total production.⁴⁴⁵

The owners' decision to embark on a new industrial initiative on mother of pearl buttons following the end of the Second World War entailed in retrospect a risky planning. It appears that the local technical staff and labourers were unqualified and inexperienced in the manufacturing of buttons using mother of pearl shells. The percentage of losses of material in the course of production and the percentage of substandard qualities obtained was high, causing an excessive expenditure for the companies in Cyprus and Aden.⁴⁴⁶ As a result, the factory manufactured buttons of poor quality leading to a 20 per cent reduction of the overall production.⁴⁴⁷ By 1947 the company was considered to be insolvent. The bankruptcy of the Dominion in June 1949, one of the largest factories and employers on the island, was characterized as an unprecedented economic catastrophe for Larnaca's economy causing the loss of £340,000.⁴⁴⁸ Bank of Cyprus absorbed the heavy economic burden. On 29th of January 1950, the Bank purchased the factory premises, covering an area of nine donums, and

⁴⁴² SA: SA1/637/1941, *ibid.* Also, SA: SA1/1058/1947, Colonial Secretary to Commissioner of Larnaca, 9.6.1952.

⁴⁴³ SA: SA1/1436/1949, Report of the Official Receiver..., *ibid.*, 10.

⁴⁴⁴ SA: SA1/1436/49, The Official Receiver's Report on the Investigation of the affairs of the Dominion Manufacturing Co. Ltd. (in Liquidation), 24.10.1949, 7-8.

⁴⁴⁵ SA: SA1/637/1941, Acting Governor of Cyprus to Creech Jones, 24.11.1947.

⁴⁴⁶ SA: SA1/1436/49, The Official Receiver's report..., *ibid.*, 10.

⁴⁴⁷ *Ibid.*, 11.

⁴⁴⁸ SA: SA1/1436/1949, Official Receiver and Registrar to Colonial Secretary, 1.2.1950.

its machinery for £5,000. A new company, the Dominion Button Co. Ltd, resumed the Jewish Dominion's operations in October 1950.⁴⁴⁹

Conclusions

The case of the Dominion Co. demonstrates how protectionism nurtured export business activity. Evidently, the Ottawa preference system created a flow of capital investment in commercial business ventures and offered new prospects for profit and gain. However, the character of business activity deemed to be ephemeral, especially for those firms heavily dependent on the British market. Profoundly, the operation of the company lasted as long as protectionism served its founding objectives, while the developments in global trade and technological advance of the 1940s should not be perceived as negligible variables of its downfall. A further study in enterprises emerging from protectionism in the British Empire and their short-term or long-term viability is expected to give new insights to this unknown aspect of entrepreneurial history.

⁴⁴⁹ *Ethnos*, 1.5.1957.

The long-term effects of management and technology transfer: Evidence from the US productivity programme

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This paper uses a unique historical episode to assess the long-run effects of management and technology transfer on firm performance. During the 1950s, as part of the Marshall Plan, the US administration sponsored management-training trips for European managers to US firms and granted state-of-the-art machines to European firms. I use newly-assembled data on the population of Italian firms eligible to participate in this programme, tracked over a twenty-year period. By exploiting an unexpected cut in the US budget, I compare firms that eventually participated in the programme with firms that were initially eligible to participate, but were excluded after the budget cut. I find that management transfer significantly increased Italian firms' survivorship, sales, employment and productivity. These positive effects persisted for at least fifteen years after the programme, a finding that can be explained by the increased investment rates, capital-to-labour ratio, more educated managers' hires, and employees training expenditures in such firms. Companies that received new machines also improved their performance, but the effects were short-lived.

A historic(al) run on repo: Repo lending and bank distress during the Austro- Hungarian *Gründerkrach* of 1873

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Why did 40 per cent of all Austro-Hungarian joint-stock banks fail during the *Gründerkrach* (founders' crash) of 1873? The *Gründerkrach* was the most severe financial crisis which hit the Habsburg Empire during the 50 years of dualism (1867-1918). However, the crash of 1873 is under-researched in modern economic history. Earlier contributions discount the explanatory power of economic theory or neglected to investigate the banking crisis in a systematic empirical way⁴⁵⁰ Drawing on new bank-level and stock market data as well as on qualitative archival evidence, my paper fills this gap in the financial history literature.

I show that bank closures during the *Gründerkrach* were tightly connected to the fate of a vibrant repurchase agreement (repo) market in Vienna. From an economic point of view, repos are short-term loans collateralized by tradeable bonds and securities. Legally, repos are composed of two separate transactions: the borrower sells securities to the lender in exchange for cash and simultaneously agrees to repurchase them, often for a higher price, in the future. Repos play a crucial role in financial systems. They generate market liquidity for many types of securities, they represent a major funding source for market-making broker dealers and they play a role in the smooth functioning of the general payment system.

I first document the role repos played in the business model of joint-stock banks preceding the *Gründerkrach*. Second, I show that the Austro-Hungarian repo market completely shut down for several months during the crisis. Third, I find that banks' repo exposure before the crash is a strong predictor of their survival during the crisis. There is also evidence that liquidity provision by an unconventional lender of last resort (LLR) mitigated lender distress. Fourth, I interpret these findings by drawing on descriptive evidence suggesting that repo lenders closed permanently due to a combination of funding pressures and market illiquidity.

To the best of my knowledge, this study is the first to examine a historical repo market crisis and its consequences using microdata. Although repo markets are known to have existed for centuries, their microstructure, evolution and role during past financial disruptions remain largely unexplored.⁴⁵¹

Data

I construct a new bank-level panel dataset which contains variables covering background information, balance sheets as well as profits and loss statements of joint-stock banks operating in Austria-Hungary between 1868 and 1878. The data for the panel was retrieved from two independent primary sources: the official statistical yearbooks for Austria and Hungary compiled and the *Compass – Finanzielles Jahrbuch*.

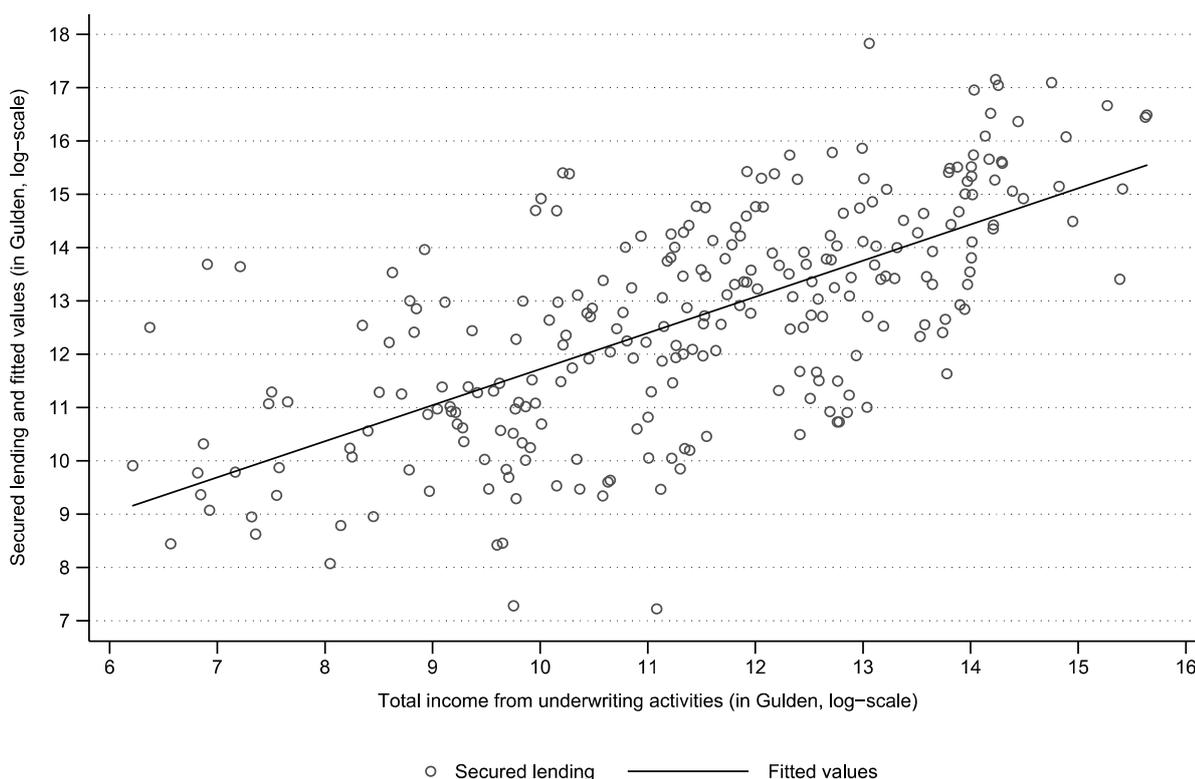
To provide a continuous long-run picture of the repo market in Austria-Hungary, I draw on the daily official stock market report of the Viennese Bourse, the *Coursblatt des Gremiums der k.k. Börse-Sensale*. For each settlement date on the stock exchange, the *Coursblatt* reported average costs for repos for selected collateral securities covering government bonds, bank, industry, and railway stocks. The *Coursblatt* reported these repo costs averaged across counterparties. I compute repo rates on a weekly basis.

⁴⁵⁰ Two examples of earlier research are Matis (1971) and Kövér (2000).

⁴⁵¹ c.f., however, Flandreau and Sicsic (2003) for a description of the French repo market in the nineteenth century.

To inform my discussion of the policy response to the crisis, I draw on extensive readings of the contemporary press and the archives of the stock exchange committee as well as the central bank (*Oesterreichische Nationalbank*, OeNB) archives in Vienna. The most binding a priori constraint on liquidity support by the central bank consisted of the OeNB's narrow definition of eligible collateral.⁴⁵² To overcome this obstacle, joint-stock bank organized in local support funds (*Aushilfs-Comités*) in major cities which lent against non-central bank eligible paper and collateral. The assets and liabilities of these funds were mutually guaranteed which enabled the OeNB to rediscount the funds' acceptances. Since the press published the list of banks subscribing to these funds, I can link individual bank membership to the financial institutions in my panel.

Figure 1



Source: Compass and Statistisches Jahrbuch

Gründerbanking and the Viennese repo market

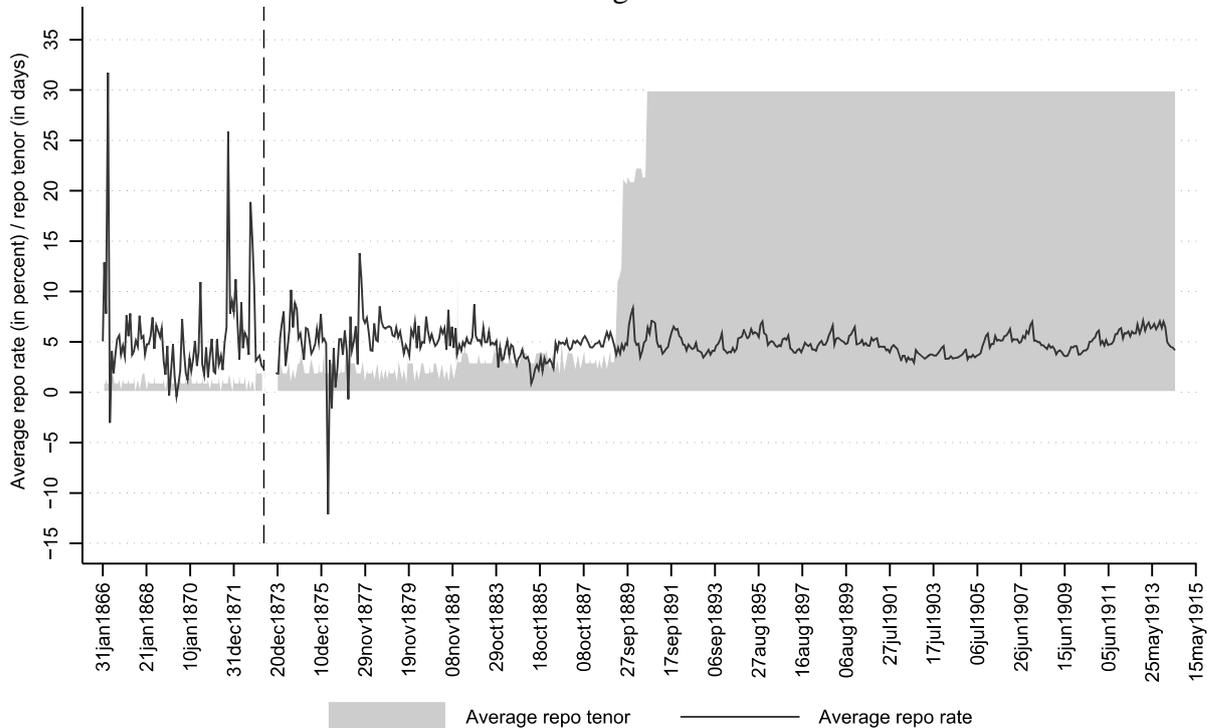
Repos played a crucial role in joint-stock banks' business model during the financial boom episode between 1867 and 1873, known as *Gründerzeit*. Investment banking was at the core of banks' commercial activities. The most important source of bank income during this time consisted of underwriting the stocks of newly founded companies. Banks organized initial public offerings (IPOs) on behalf of the founders from a large variety of sectors (e.g. banks, construction, industry and infrastructure).

In this context, repos were used in several ways. First, banks lured founders into choosing them for their company's IPO by providing bridge-financing in the form of repos against the stocks of the newly created firm. These repos were granted even before the stocks serving as collateral were officially traded. Second, banks offered to lend temporarily against the stocks they introduced to the market to attract brokers and investors to buy into an IPO. Thus, buyers only necessitated equity worth a fraction of the stocks they wanted to purchase.

⁴⁵² For a detailed discussion of the monetary policy setting, c.f. Jobst and Rieder (2016) who also show that, on aggregate, the OeNB rationed credit provision via the discount facility during the crash of 1873.

Third, repos were used by brokers to extend credit to individual clients. Finally, due to attractive interest rates, banks considered repos also as an attractive short-term investment of their cash reserves: repos bore seemingly low counterparty and liquidity risk while the boom lasted. Figure 1 reflects the tight connection between underwriting activities and secured lending on the bank-level. At the end of 1872, 75 per cent of secured lending was done in repos. At this time, repos represented 20 per cent of total banking sector equity.⁴⁵³

Figure 2



Source: own calculations; Compass, Coursblatt des Gremiums der k.k. Börse-Sensale and Wiener Zeitung

Figure 2 summarizes the long-run evolution of the repo market. It displays the average maturity and average interest rate charged for repos between 1866 and 1914. The *Gründerzeit* stands out as a period of high rate volatility and very short average maturities. The *Gründerkrach* also emerges as an exceptional period. On 8 May 1873, the market shut down for seven months, after a prime brokerage house and major repo borrower filed for bankruptcy. This collapse followed a pronounced decrease in stock prices starting in April 1873, when many of the recently founded companies first published their balance sheets. Not surprisingly, contemporary accounts of the *Gründerkrach* link banking sector distress directly to the demise of the repo market:

On the eve of the Krach, most of the banks' capital was employed in repos and precisely this caused the crisis to have such a fatal origin and evolution. The repo lenders immediately placed margin calls when prices started to fall; at first, these margin calls were met. Yet, the continuous erosion of prices was soon accompanied by the market illiquidity and worthlessness of collateral (...); the investment banks, which held repo portfolios ten times as high as their equity capital, intended to gain some room for manoeuvre by selling collateral into the market, but the securities offered could not be sold even at the very lowest prices. (...) Repo lenders suddenly became owners of securities, they never wanted to possess, and at prices which devoured the previously gained profits and parts of their equity at least momentarily.⁴⁵⁴

⁴⁵³ This paper always uses the term 'equity' to refer to paid-up capital plus contingency reserves.

⁴⁵⁴ Translated by the author from Wirth (1874: 139-141); c.f. also Neuwirth (1874) and Schäffle (1874).

Empirical strategy

In order to investigate the drivers of bank failures during the *Gründerkrach*, I use Cox proportional hazard regressions. This type of semi-parametric survival analysis does not assume any underlying distribution of failure times while allowing for the inclusion of explanatory variables.

Discussions of causal identification in bank survival models are rare and authors often implicitly rely on the assumed exogeneity of shocks to banks' financial health. An instrumental variable approach may be a solution for one particular regressor, but is difficult to implement if many variables are of simultaneous interest. In an attempt to address the problem of omitted variable bias more explicitly, I draw on a technique called 'baseline hazard stratification'. This method is the survival analysis analogue to a fixed effects estimator in panel regressions.⁴⁵⁵ It can be used to purge the model of unobserved heterogeneity at a specified group-level. To my knowledge, I am the first to employ stratification techniques in the context of bank-level survival regressions. My baseline model is the following:

$$h_i(t) = h_0(t)_{b,c} * \exp(\beta * X_{i,1872}) \quad [1]$$

Equation 1 models the hazard h for bank i at time t as a function of a baseline hazard h_0 and a vector X of variables indicating bank health or risk exposure. The dependent variable is the time-to-event in months, where 'event' is defined as terminal bank closure (liquidation, bankruptcy, or merger). The onset of risk in equation 1 is 31 December 1872 and the end of my observation period is 31 December 1874. To minimize simultaneity problems, my baseline model only uses the cross-section of bank characteristics measured at the end of 1872 for X . I stratify the baseline hazard h_0 to account for the different riskiness of joint-stock bank specializations (b) and heterogeneity of risk exposure at the city-level (c). There are four bank types (universal bank, mortgage bank, savings bank and pawn bank) and 73 cities present in my sample of 181 banks; 64 banks or, 35 per cent of the sample, fail before the end of 1874. Table 1 provides the summary statistics for the variables in X . In the selection of variables, I followed 'best practice' in similar bank failure studies⁴⁵⁶ and included two *Gründerkrach* specifics (the repo exposure and membership in *Aushilfs-Comités*).

Results

Table 2 summarizes the main results. For all regressions, the variables have been standardized and the coefficients show the effect on survival performance of a one standard deviation increase in the regressor. All coefficients are displayed as hazard ratios. The proportional hazard assumption cannot be rejected in any of the specifications and the link test for model specification never rejects the null of correct specification.

All variables enter the results with the expected signs.⁴⁵⁷ In my preferred specification with stratification and clustered standard errors at the city-level (column 3), I find that higher bank-level exposure to repo loans, higher leverage, and lower profitability at year-end 1872 are statistically significant predictors of bank failure. The estimated coefficients are also economically significant. A one standard deviation increase in the repo exposure increases the rate of bank failure by 27 per cent. The same increase in the leverage ratio increases the hazard by 53 per cent, while shifting the return on equity by this amount reduces it by 43 per cent. Interestingly, all other variables which are important predictors in specifications (1) and (2) lose their significance when fixed effects are introduced. These results provide evidence for significant unobserved heterogeneity on the city and bank-type level which may induce spurious correlations in the absence of stratification. Thus, the results suggest that strong

⁴⁵⁵ c.f. Cleves et al. (2016)

⁴⁵⁶ For an older and recent example, c.f. Calomiris and Mason (1997) and Postel-Vinay (2016).

⁴⁵⁷ Recent work emphasizes exposure to illiquid mortgages as an important risk factor (Postel-Vinay, 2016), whereas I find the contrary after controlling for overall asset illiquidity.

caveats might be in order for bank survival studies which do not control sufficiently for omitted variable bias.

Table 1

Variable	Obs	Mean	Std. Dev.	Min	Max	T-stat ¹
Repos to equity	181	0.10	0.54	0.00	6.66	-1.96**
Aushilfs-Comité member	181	0.15	0.36	0.00	1.00	2.00**
Deposits to cash assets	181	1.21	2.74	0.00	32.22	-2.66***
Mortgage loan share	181	0.09	0.24	0.00	1.00	2.49***
Bank age (log)	181	1.31	0.62	0.00	3.50	5.28***
Return on equity	181	0.17	0.22	-0.74	1.09	0.25
Leverage ratio	181	4.64	4.08	1.00	25.25	-1.72**
Real estate to non-cash assets	181	0.02	0.06	0.00	0.46	-0.15
Illiquid assets to total assets	181	0.46	0.32	0.00	1.00	-3.36***
Bank size (log)	181	14.91	1.64	11.23	19.29	-0.67
Failing daughters to total daughter banks	181	0.08	0.23	0.00	1.00	-0.35
Failing mothers to total mother banks	181	0.10	0.28	0.00	1.00	-1.91**
Failing correspondents to total correspondents	181	0.13	0.27	0.00	1.00	-1.11

¹Mean equality tests for survivors vs. failures; * p< 0.10, ** p< 0.05, *** p< 0.01

Table 2

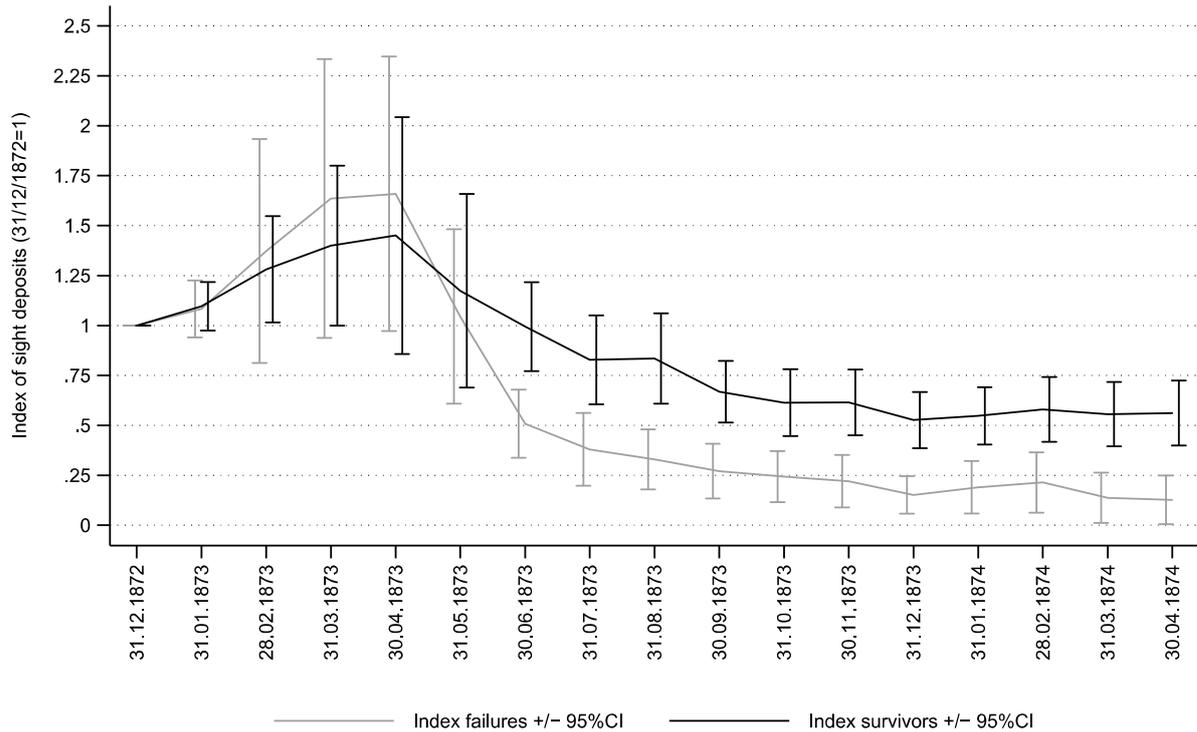
	(1)	(2)	(3)
Repos to equity	1.324*** (0.126)	1.324*** (0.105)	1.267*** (0.0991)
Aushilfs-Comité member	0.289** (0.153)	0.289*** (0.136)	0.157*** (0.0308)
Deposits to cash assets	1.395*** (0.141)	1.395*** (0.137)	1.241 (0.226)
Mortgage loan share	0.393*** (0.127)	0.393** (0.178)	0.777 (0.246)
Bank age (log)	0.559*** (0.105)	0.559* (0.177)	0.457 (0.261)
Return on equity	0.491*** (0.0858)	0.491*** (0.0568)	0.565*** (0.0514)
Leverage ratio	2.051*** (0.311)	2.051*** (0.291)	1.535*** (0.233)
Real estate to non-cash assets	1.313** (0.176)	1.313** (0.181)	1.166 (0.250)
Illiquid assets to total assets	1.674*** (0.300)	1.674** (0.337)	1.310 (0.357)
Bank size (log)	1.383 (0.283)	1.383 (0.375)	1.161 (0.272)
Failing daughters to total daughter banks	0.917 (0.140)	0.917 (0.127)	1.017 (0.104)
Failing mothers to total mother banks	1.163 (0.158)	1.163 (0.246)	1.082 (0.405)
Failing correspondents to total correspondents	0.985 (0.158)	0.985 (0.116)	0.966 (0.170)
Observations	181	181	181
Failures	64	64	64
Total time at risk	3380	3380	3380
Log-likelihood	-271.94	-271.94	-81.79
Prob> Chi2	0.0000	0.0000	0.0000
PHA test	0.33	0.96	0.23
Link test	0.56	0.56	0.76
Clustered standard errors	×	✓	✓
Fixed effects (bank-type and city)	×	×	✓

Standard errors in parentheses: * p< 0.10, ** p< 0.05, *** p< 0.01

Another interesting result is the significance of *Aushilfs-Comité* membership in boosting banks' chances of surviving the crisis: in specification (3), membership reduces the bank-level hazard by 84 per cent. This result suggests that private-public cooperation was highly effective in circumventing the OeNB's strict collateral requirements. Given remaining worries concerning the potential endogeneity of bank selection into the *Aushilfs-Comités*, I would like to emphasize the correlation rather than causal nature of this finding.

All results discussed above are robust to the inclusion of further controls (in particular further controls for contagion such as the impact of failures nearby), systematic outlier exclusion and random (shared frailty) effects on the city-level.

Figure 3

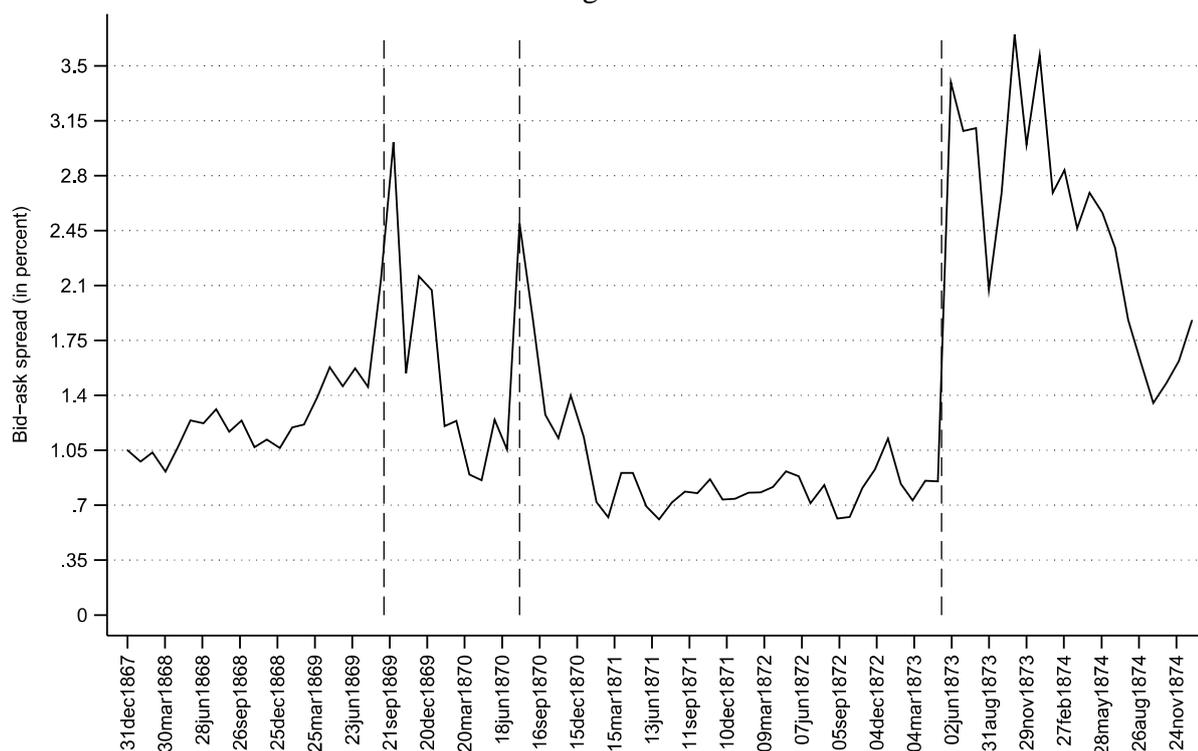


Source: own calculations; Tresor and Wiener Zeitung

Mechanism

Although leverage and profitability exercise an economically greater impact on bank survival, they also represent much more general characteristics than the specific channel of repo exposure. Why did repo exposure matter so much? The quote from Wirth (1874) suggests a combination of funding pressures and market liquidity led to repo lender distress. Figure 3 summarizes average monthly deposit flows for surviving and failing Austro-Hungarian banks. It shows that banks which closed during the *Gründerkrach* suffered targeted funding withdrawals. Under these circumstances, one expects targeted lenders to call in loans and withdraw from the market to generate portfolio liquidity. In case of borrower default, lenders would likely have to fire-sell repossessed securities at prices that cut deep into their equity. Figure 4 lends suggestive evidence to this channel. It displays a strong and persistent hike in the average bid-ask spread for stocks traded on the Viennese Stock Exchange after 8 May 1873: market illiquidity peaked during the *Gründerkrach*. Fire sales represent a plausible candidate for a mechanism that drove this large a wedge between bid and ask prices on the Bourse.

Figure 4



Source: own calculations; Compass, Coursblatt des Gremiums der k.k. Börse-Sensale and Wiener Zeitung

Discussion

In 2008, the repo market's critical functions ceased to operate when some of its segments experienced severe disruptions. Funding flows collapsed precipitously, when Lehman Brothers, a US investment bank and major repo debtor, declared bankruptcy in September 2008.⁴⁵⁸ Concrete attempts to foster the resilience of repo markets remain tentative eight years after the runs of 2008, because our knowledge of systematic patterns in the causes and consequences of repo market instability are limited. On the one hand, 'repo runs' are rare events that only occur under extreme financial market distress. On the other hand, data on shadow banking activities, where most repo action takes place, are hard to find even for the most recent crisis.

Analysing historical repo market disruptions can be one innovative way forward to enhance our understanding of recent developments. For example, my findings corroborate work by Copeland et al. (2014) who emphasize the role of market microstructure in explaining the varying degrees of resilience to distress in different segments of the US repo market. The Austro-Hungarian experience suggests that repo markets with short maturities in which lenders themselves are susceptible to sudden funding withdrawals are prone to sudden break-downs of funding flows.

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⁴⁵⁸ c.f. Brunnermeier and Pedersen (2009) and Gorton and Metrick (2012).

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Government-made bank distress: Industrialization policies and the 1899-1902 Russian financial crisis

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In the mid-to late 1890s, the Russian Empire was undergoing exceptional industrial growth.⁴⁵⁹ The state acted as a catalyst for the country's economic development by procuring industrial products and by incentivizing industrial companies to expand operations to match state and private sector demand. Simultaneously, joint-stock commercial banks acted as financiers to industrial firms. Information emanating from the government about state procurement decisions and/or the progress and benefits of industrial development induced banks to finance industry in the first place. In 1899, the well-tuned triangular relationship between the government, the banking sector, and industry started to come apart due to a sudden decrease in the inflow of European capital to Russian government bonds and industrial enterprises. This resulted in a rapid stock market decline, a reduction in demand for industrial products, industrial bankruptcies, and a fall in the heavy industry production – culminating in overwhelming losses among banks.⁴⁶⁰ Because banks supplied over half of all financing received by the industrial sector, banking distress put the successes of the 1890s at stake.⁴⁶¹

What caused such a swift reversal in industrial growth? Many contemporaries saw the roots of the 1899-1902 financial and industrial crisis in the sharp decline in the foreign capital inflow – a strictly exogenous factor (Brandt, 1904; Migulin, 1907). Others saw the genesis in the reduction in government procurement of industrial output (Ozerov, 1905; Kanel, 1906; G., 1907). According to the Finance Minister Sergei Witte's anticipatory view, the weak corporate and stock exchange regulation was a recipe for eventual disaster (Witte, 1898). The last cause of the crisis was thought to be state industrialization policies of the 1890s, which unduly stimulated heavy industry, leading to its overbuilding and eventual contraction (Gindin, 1996).

The aim of my paper is to uncover whether, and to what extent state industrialization policies of the 1890s contributed to bank losses during this crisis. The importance of this enquiry comes from the fact that the influence of the state on a banking system can be of a destabilizing nature. When that happens, banking distress and failure might follow which, in turn, is likely to lead to the fall in the supply of money to the real economy (Friedman & Schwartz, 1963) along with other non-monetary effects (Bernanke, 1983), together weakening aggregate economic activity. More generally, my paper aims to help historians to better understand the political economy of Imperial Russia's industrial development on the eve of the revolutionary period.

Empirical strategy

In order to determine the passage of distress from the state to the banking sector, this study captures personal connections, or more formally interlocking directorates, between banks, government entities, and non-financial companies. Specifically, a well-informed political interlock is recorded when a bank board member or his brother is part of a group of top government officials who were well-informed – due to their social proximity to the Finance Minister Sergei Witte – about state procurement decisions and/or the progress and rewards of

⁴⁵⁹ Russia's net national product increased by 40% between 1893 and 1899 and 70% between 1891 and 1899 (Gregory, 2003). The value of manufactured output rose by 69% between 1893 and 1900 (Bovykin and Ananich, 1991).

⁴⁶⁰ Heavy industrial output declined by 1% in 1901 and 6.2% in 1902 (Borodkin, 2011).

⁴⁶¹ Own calculation based on data from Bovykin (1894), Golubev (1898), State Bank (1899), and Russian State Historical Archive (n.d.).

industrial development. Sergei Witte was at the epicentre of industrial policy-making. He was the designer and implementer of the national industrialization strategy of the 1890s and the final decision-maker on state procurement contracts, subsidies, and other development measures (Shepelev, 1981; Gindin, 1996; Solovyov, 2003). Separately, a heavy industry interlock is recorded when a bank board member is also a board member at a heavy industrial firm, or when the banker's brother serves in that role. Bankers' connections with heavy industrial companies present an alternative way of tracing the effect of government policies on bank performance. This is because heavy industrial firms were strongly incentivized by state policies to expand their operations, which resulted in overexpansion of production in the years leading up to the crisis. Heavy industrial firms were highly reliant on state procurement, which fell with respect to some products during the crisis, leading to losses. On top of this, I register three additional types of interlock: to capture bankers' connections with a wider range of government officials, non-financial companies, and other banks.

I have collected and digitized two types of data: bank financial statements and names of government officials employed by various state organizations, as well as names of members at banks and non-financial companies. Collectively, I identify 416 bankers, 3,378 corporate board members, and 7,596 government officials. Matching names of these individuals reveals that 49 bankers had personal linkages to 63 government officials and 176 bankers possessed personal ties to 418 corporate board members.

Next I determine how the presence of government and industrial connections within each bank affected bank performance in the crisis. Bank distress is measured in the form of (1) net portfolio investment losses for the period of 1899-1902 as a percentage of the average value of portfolio investments owned by the bank during the same time period and (2) the percentage change in the bank share price from the maximum to the minimum level over the year 1899, the only period throughout the crisis that was chiefly free from direct government intervention in the stock market. OLS regression models are used to analyse the impact of interlocks.

Results

In tables 1 and 2, my statistical results demonstrate that banks that experienced greater distress during the crisis had more connections to government officials who were well-informed – due to their social proximity to Sergei Witte – about the industrialization policies and state procurement contracts. The conclusion is that banks that had been influenced the most by the state's industrialization policies exposed themselves financially to heavy industrial companies and, as a result, experienced greater losses during the crisis.

Moreover, banks that experienced more acute distress in the crisis had more personal connections to heavy industrial companies. The interpretation is that banks that suffered the greatest losses were the ones that had been financially exposed, either via direct loan financing or underwriting, to companies most stimulated by state policies to expand operations. Put together, these two complementary findings indicate a negative effect of national industrialization policies on bank performance during Russia's state-led development.

Aside from this, I find that banks did not experience greater distress if they had more personal ties to competitor banks, as shown in my primary regression model in table 1. This suggests that personal interconnectedness among bankers did not contribute to the increase in financial interconnectedness among banking institutions.

Table 1: Net investment losses 1899-1902, OLS model

	1	2	3	4	5
Member connected to the government	0.012 (1.06)				
Member connected to the Finance Minister's circle		0.060*** (4.32)			
Member connected to non-financial firms			0.024*** (4.16)		
Member connected to heavy industrial firms				0.043*** (5.76)	
Member connected to banks					0.013 (1.24)
Bank age	0.004 (0.98)	0.004 (1.45)	-0.000 (-0.00)	-0.000 (-0.05)	0.003 (0.80)
Regulations	0.090 (1.14)	0.134** (2.11)	-0.001 (-0.01)	-0.004 (-0.08)	0.074 (0.95)
Number of locations	0.000 (0.19)	-0.002 (-1.41)	-0.001 (-0.92)	-0.001 (-1.10)	-0.000 (-0.11)
Leverage	-0.066 (-0.55)	0.081 (0.83)	-0.067 (-0.70)	0.019 (0.23)	-0.057 (-0.49)
Liquidity	0.707 (1.08)	0.156 (0.30)	0.612 (1.19)	0.044 (0.10)	0.673 (1.05)
Asset growth	0.079 (1.47)	0.074* (1.75)	0.092** (2.13)	0.089** (2.37)	0.067 (1.26)
Board size	0.002 (0.37)	-0.001 (-0.47)	-0.005 (-1.43)	-0.004 (-1.33)	0.003 (0.74)
Constant	-0.082 (-0.82)	-0.133 (-1.67)	0.027 (0.31)	0.019 (0.26)	-0.070 (-0.70)
Observations	39	39	39	39	39
Adjusted R^2	-0.001	0.360	0.342	0.507	0.012

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Bank share price percentage change 1899, OLS model

	6	7	8	9	10
Member connected to the government	-0.013 (-1.19)				
Member connected to the Finance Minister's circle		-0.034** (-2.08)			
Member connected to non-financial firms			-0.016** (-2.76)		
Member connected to heavy industrial firms				-0.024** (-2.60)	
Member connected to banks					-0.025** (-2.21)
Constant	-0.130*** (-4.94)	-0.124*** (-5.40)	-0.071** (-2.13)	-0.100*** (-3.77)	-0.116*** (-4.74)
Observations	25	25	25	25	25
Adjusted R^2	0.017	0.122	0.216	0.194	0.140

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Literature contribution

The findings of my paper add to three strands of literature. First, it enhances our understanding of the recently renewed topic of the government's role in contributing to, and even originating, financial and economic crises. Most research on this subject comes in the form of narrative evidence and hypotheses based on historical accounts (Hammond, 1957; Gerschenkron, 1962; Cameron, 1967; Krugman, 1998; Cassis, 2002; Calomiris, 2009; Rajan, 2010; Calomiris & Haber 2014; Turner, 2014). In the case of Russia, Gerschenkron advanced a view that the state was the 'agens movens of industrialization' (Gerschenkron, 1962, p.20), or the primary driver of economic development. The evidence presented in this paper points out that the performance of Russian banks and heavy industry was in the end to a large extent affected by the state. On the one hand, the possession of information about the benefits of industrialization policies and state procurement contracts induced banks to finance heavy industrial companies. On the other hand, government policies had an overly encouraging effect on heavy industry production. The state was thus responsible for distress in both the banking and industrial sectors. Moreover, given that banks were significant providers of industrial capital, supplying over half of total industry financing, it is logical to infer that the entire heavy industry development was dependent on banks' unbroken supply of funds to industry. My line of evidence thus supports Gerschenkron's arguments, and at the same time questions Gregory's (1991, 1994) revisionist view that the Russian state was not a vital player in the industrialization of the 1890s.

Apart from the above-mentioned qualitative evidence, there is only limited empirical evidence on government policies affecting banking performance. Friedman & Schwartz (1963) is one empirical study that links banking instability to mistakes made by a government entity, namely a central bank. Sylla's (1975) work provides statistical evidence on how specific financial policies affected the behaviour of financiers. These works differ from my research in that I capture the effect of a comprehensive government programme on bank performance.

Second, this paper assembles a historical puzzle on the interrelationship between the Russian government and the private industrial sector. I put together data on the flow of capital, including state procurement, government finances, and foreign investments along with qualitative evidence on the flow of information between the government, banks, and industry. I consolidate existing findings on this subject and bring to light the profound archival work of Russian historians whose research has never been used before in the world literature.

Third, this paper adds to the literature studying the impact of bankers' personal connections on bank performance. Existing literature has found political interlocks having both a negative (Duchin & Sosyura, 2012; Grossman & Imai, 2016) and positive impact (Braun & Raddatz, 2010; Acemoglu et al., 2013) on bank performance. This paper argues that a negative influence is very much a possibility. When it comes to interlocks with non-financial firms, this paper's research adds to the established view of this type of connection having mostly a negative impact in times of crises (Laeven, 2001; La Porta et al., 2003; Colvin, 2014; Colvin et al., 2015). Lastly, the presented study contributes to the scarcely-researched topic of personal ties being responsible for the propagation of both profits and losses among banks (Fowler et al., 2014; Colvin et al., 2015). This paper finds that personal interconnectedness between competitor banks can lead to no significant effect on bank performance.

Conclusion

The findings of this paper suggest that policy-makers should be mindful of the possible negative financial impact of not only banking policies but also those aimed at real sector companies. In industrializing Russia, it was policies targeted at the development of the real sector that enticed banks to financially expose themselves to new industrial companies, which led to disastrous bank performance with the coming of major difficulties in the industry.

Given Czarist Russia's subsequent dissent into a period of instability and eventually revolution, it is vital that policy-makers are aware of the possible long-term political ramifications of their actions.

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‘Bagehot on holiday’

The lender of last resort, allocation, and the evolution of banks’ lending: Evidence from the 1931 banking crisis in Spain

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The recent financial crisis has revived the debate about the political economy of central banking. By acting as lenders of last resort (LOLR), all major central banks have conducted large expansions of the monetary base to grant enough liquidity to the system and avoid the collapse of the banking sector. While the role as LOLR is now widely accepted as one of the fundamental functions of a central bank,⁴⁶² its side effects remain much less described, especially in historical perspective. This is particularly important, since the LOLR idea itself has a long history, in which Walter Bagehot’s *Lombard Street* is frequently portrayed as the main reference.

Using newly collected archival material, from both the central bank and the banking system at the daily and bank level, this paper tries to shed light into the side effects of the LOLR by studying the allocation of emergency liquidity among different banks during the 1931 banking crisis in Spain. In particular, I focus on two questions. The first is the impact of a raise in the price of emergency liquidity in banks’ borrowing pattern. This has been debated since the nineteenth century, and continues to be debated today.⁴⁶³ As recent theoretical work shows, central banks can improve the efficiency in the allocation of liquidity by exploiting banks’ different price-elasticity of demand for central bank liquidity during a crisis.⁴⁶⁴ Interestingly, this was already a central concern in Bagehot’s work, who argued.⁴⁶⁵

‘The rate should be raised early in the panic, so that the fine may be paid early; that no one may borrow out of idle precaution without paying well for it; that the banking reserve may be protected as far as possible.’

Secondly, I look at the relation between allocation of emergency liquidity and banks’ lending capacity in the longer run, in order to show that banks that managed to obtain excess liquidity from the central bank could retain their market shares and emerged from the crisis faster, irrespective of how much confidence they regained from depositors.

The 1931 banking crisis and the intervention of the Banco de España

Following the proclamation of the Second Spanish Republic on the 14 of April 1931, the banking system lost 22 per cent of its total deposits, amounting to 1,600 million pesetas. Around 70 per cent of the total deposit loss was concentrated in the six largest banks.⁴⁶⁶ To cope with the liquidity shock, banks resorted to the Banco de España (BdE), who responded by injecting 1,500 million pesetas, nearly doubling the size of its portfolio of securities (figure 2). Therefore, on the aggregate, the expansion of the monetary base conducted by the BdE almost entirely compensated for the withdrawal of deposits.

⁴⁶² BIS (2009).

⁴⁶³ Thornton (1802), Bagehot (1873), Laidler (2002), Levy Economics Institute (2013), Bordo (2014).

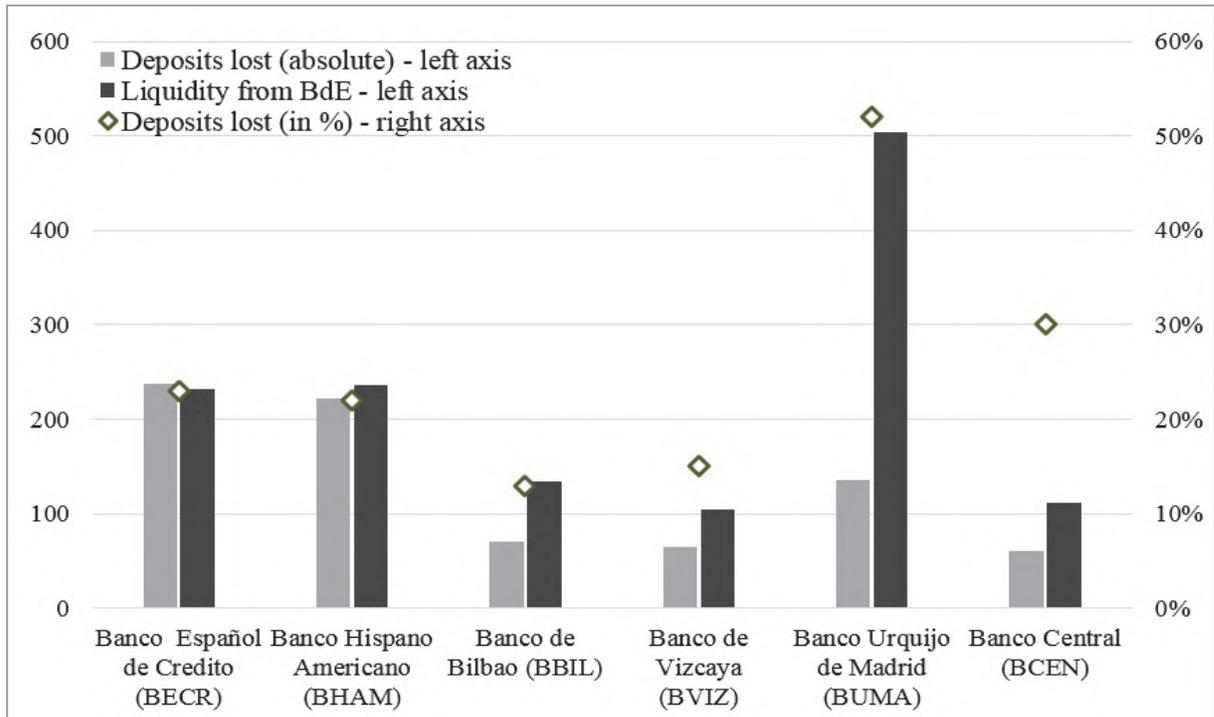
⁴⁶⁴ Martin (2006).

⁴⁶⁵ Bagehot (1873, p.199).

⁴⁶⁶ By size of assets these were Banco Español de Crédito (BECR), Banco Hispano Americano (BHAM), Banco de Bilbao (BBIL), Banco de Vizcaya (BVIZ), Banco Urquijo de Madrid (BUMA) and Banco Central (BCEN). Empirical analysis can be done only using 20 banks. Banks that are susceptible to having obtained significant liquidity in other branches as well as outliers are excluded from the analysis. This does not alter the paper’s findings.

However, a look at borrowing at the bank level reveals that the allocation of liquidity was far from proportional. Figure 1 shows the six largest banks' deposit losses and liquidity received from the BdE (banks are ordered from largest to smallest, from left to right). While the largest branched banks (BECR, BHAM) received almost the same amount of emergency liquidity from the BdE as they lost through deposit withdrawals, other banks received nearly four times more than that (BUMA). While BHAM and BECR were nearly three times larger than BUMA and were widely branched all over the Spanish territory, the latter received more liquidity than the other two combined. In total, this bank received more than one-third of the total liquidity injection.

Figure 1: *Deposit loss and BdE liquidity, six largest banks, Mar to Sept 1931 (million pesetas)*



Source: author's database

The side effects of inconvertibility and strategic borrowing

The Spanish peseta has not been convertible since the late nineteenth century.⁴⁶⁷ This allowed the BdE to operate under a more flexible standard than other central banks that operated a convertible currency. The international historiography seems to have agreed in that this allowed Spain to fare better than other countries during the Great Depression.⁴⁶⁸ Spanish historiography has been more sceptical,⁴⁶⁹ and recent research has also casted doubt on that.⁴⁷⁰ For instance, net capital formation fell by 30 per cent in 1931⁴⁷¹ while total lending from the banking system to the private economy dropped 20 per cent.

⁴⁶⁷ Martínez-Ruiz and Nogues-Marco (2014).

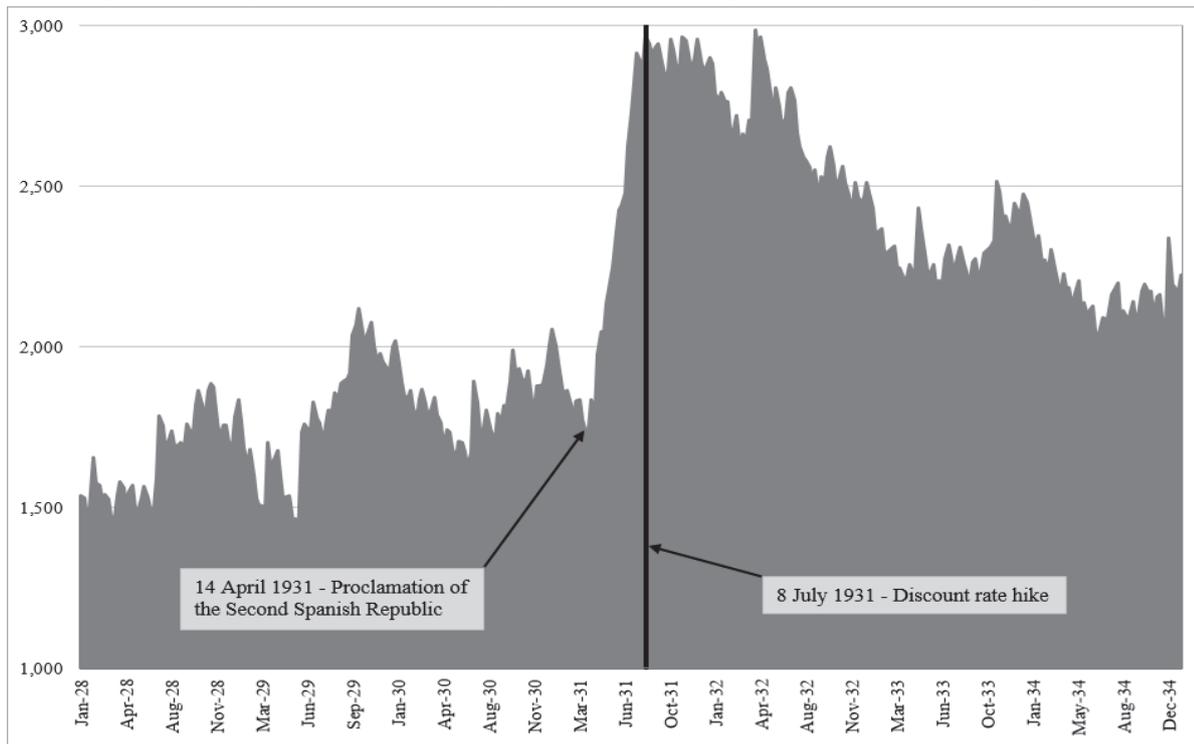
⁴⁶⁸ Choudhri and Kochin (1980), Bernanke and James (1991), Grossman (1994) or Reinhart and Rogoff (2011).

⁴⁶⁹ Martín-Aceña (1984), Beltrán, Martín-Aceña and Pons (2012).

⁴⁷⁰ Albers and Uebele (2015).

⁴⁷¹ Prados de la Escosura (2003).

Figure 2: *Portfolio of securities of the Banco de España, 1928-34 (million pesetas)*



Source: Martinez-Mendez (2005) and Banco de España (various years)

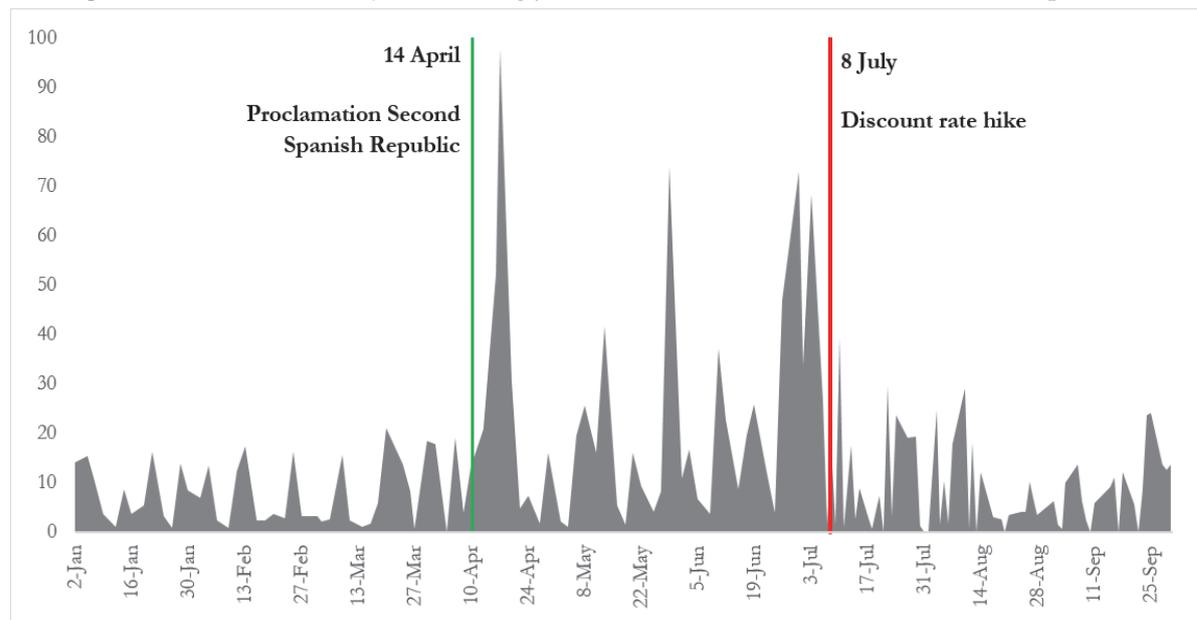
Besides the macroeconomic accounts of the crisis, however, there is an interesting fact that links Spain's inconvertible currency to the way the LOLR intervention was conducted. Not having to protect a gold cover, the BdE didn't have to follow Bagehot's precept of raising the rate *'early in the panic'*, as its gold reserve was never under threat. Therefore, the BdE could inject liquidity before raising its price, as opposed to what was the practice in gold-standard countries at the time.⁴⁷² This reduced the scope to which the BdE could use the price of liquidity to improve its allocation.

The fact that the BdE could inject liquidity without keeping an eye on the evolution of the metallic cover – as it would be granted an expansion in the note issuing limit whenever circulation approached it – does not mean that it was comfortable with lending *freely* at banks' demand. Already at the onset of the crisis, the BdE warned that it would provide emergency liquidity but that this would be conditional on banks' *healthy policy*, with the final aim of avoiding an excessive increase in circulation. The BdE was worried that excessive liquidity would contribute to further depreciate the currency and cause inflation.⁴⁷³

⁴⁷² Eichengreen (1996).

⁴⁷³ Archivo Histórico, Banco de España (L.12087, p.56).

Figure 3: All banks' daily borrowing from the BdE, Jan to Oct 1931 (million pesetas)



Source: author's database

Moral suasion in the form of a warning about banks' borrowing from the discount window at the onset of the crisis did not seem to work, as some banks kept borrowing from the BdE despite the fact that they had already become very liquid.⁴⁷⁴ On the 8th of July, after a continued surge in banks' demand for liquidity that started in late June, the discount rate was finally raised. Rediscounting bills of exchange at the BdE became 100 basis points more expensive.⁴⁷⁵ The BdE and the Ministry of Finance, which finally agreed to raise the rate, thought that this move would contribute to curbing the increase in fiduciary circulation, although in a small proportion.⁴⁷⁶ Despite their scepticism about the effectiveness of the rate hike, they achieved their aim immediately. Borrowing came to a halt after the rate was raised (figure 2). However, the fact that the bulk of emergency liquidity was injected before its price was raised, opened the scope for strategic and excess borrowing, and prevented the BdE from pricing emergency liquidity in a way that allowed for a more efficient allocation.

Eligibility at the discount window and anticipation of the rate hike

Bagehot wrote in nineteenth-century Britain, with a clear focus on the London money market. Two important characteristics of the London money market conditioned the way he described what the Bank of England ought to do in a banking panic. The first was that the market rate was below the Bank Rate, so whenever the money market dried, the market rate soared and hit the Bank Rate automatically. There was little room for anticipating changes in the price of liquidity. The second characteristic was that the London market had a system of third party acceptance of bills of exchange that allowed bills to be scrutinized before they reached the Bank, which allowed it to identify 'good banking securities'.⁴⁷⁷ Although accessing to the discount window was not anonymous, the system operated as a 'quality buffer' between the market and the Bank.⁴⁷⁸

The money market in Spain, as in other peripheral countries,⁴⁷⁹ was very different. The rediscount rate of the BdE was, on average, 200 basis points below the market rate for

⁴⁷⁴ See full paper for details.

⁴⁷⁵ See full paper for details.

⁴⁷⁶ Archivo Histórico, Banco de España (L.27159, p.185).

⁴⁷⁷ King (1936).

⁴⁷⁸ Flandreau and Ugolini (2011).

⁴⁷⁹ Morys (2013).

bills. In addition, discount rate changes were widely anticipated. They had been anticipated in 1928 and 1930 and the same happened in 1931. From mid-June, the prospects of a rate change were openly discussed in the press. Already on the 12th of June, newspapers were aware of the debate between the BdE and the Ministry of Finance about increasing the rate to curb the depreciation of the currency.⁴⁸⁰ On the 19th of June, a stronger probability was given to the rise in the discount rate because the Ministry thought that it was *too cheap*.⁴⁸¹ The next week witnessed the largest and continued surge in borrowing from the discount window, pushing the BdE and the Ministry to raise the discount rate. While it is difficult to disentangle whether the imminent end of cheap liquidity caused a surge in borrowing or the surge in borrowing caused the end of cheap liquidity, evidence from individual banks shows that some borrowed heavily in the days before the rate hike although they were already extremely liquid.⁴⁸²

The second substantial difference was that the eligibility criteria at the discount window of the BdE was unclear. As opposed to the system that developed in London, Spanish banks discounted bills to firms and rediscounted them directly at the BdE. There was no third party involved in the vast majority of the operations. Some banks were very frequent discounters already before the crisis (BUMA, BBIL) but others (BHAM, BECR) very rarely accessed the discount window of the BdE. Interestingly, contemporary observers were already aware of this limitation. In 1933, two of the most prominent economists of the time, claimed that:

‘This is one of the most discussed issues in Spain. Currently it is not possible to know neither what the Banco de España discounts to private banks nor what the private banks bring to the Banco for discount.’⁴⁸³

The non-existence of a third party that evaluated bills of exchange before they reached the BdE implied that different banks faced different eligibility constraints. When examining the determinants of allocation of liquidity at the bank level, the only variable that significantly explains how much liquidity banks received during the 1931 crisis is their previous use of the discount window of the BdE. Other variables such as capitalization, liquidity, deposit loss or size of the bank are not significant, thus casting doubt on the BdE’s criterion for a bank’s *healthy policy*.⁴⁸⁴ Moreover, qualitative evidence points to a very asymmetric access to the discount window; some banks being able to take access for granted and others being unsure about what kind of bills were eligible.⁴⁸⁵

Long term consequences of the misallocation of emergency liquidity

To have a measure of how liquidity was allocated, I create a variable, which is defined by:

$$\text{Allocation}_i = B_i / D_i$$

where B_i is the amount of central bank liquidity obtained by bank i , and D_i is the absolute value of its deposit loss. A value of 1 implies that the bank received from the BdE the exact amount to meet its clients’ demands for converting deposits into cash. Values over 1 imply excess liquidity and values below 1 imply banks remaining illiquid throughout the crisis, thus having to call back a larger share of loans. Figure 4 shows that Allocation correlates strongly with the evolution of banks’ lending after the crisis. In addition, it can be seen that there is one big outlier – BUMA – which, despite losing more than 50 per cent of its deposits, could sustain and even expand lending thanks to receiving an allocation value of around 4.

⁴⁸⁰ *El Financiero*, 12 June 1931, Year XXXI, p.793.

⁴⁸¹ *El Financiero*, 19 June 1931, Year XXXI, p.829.

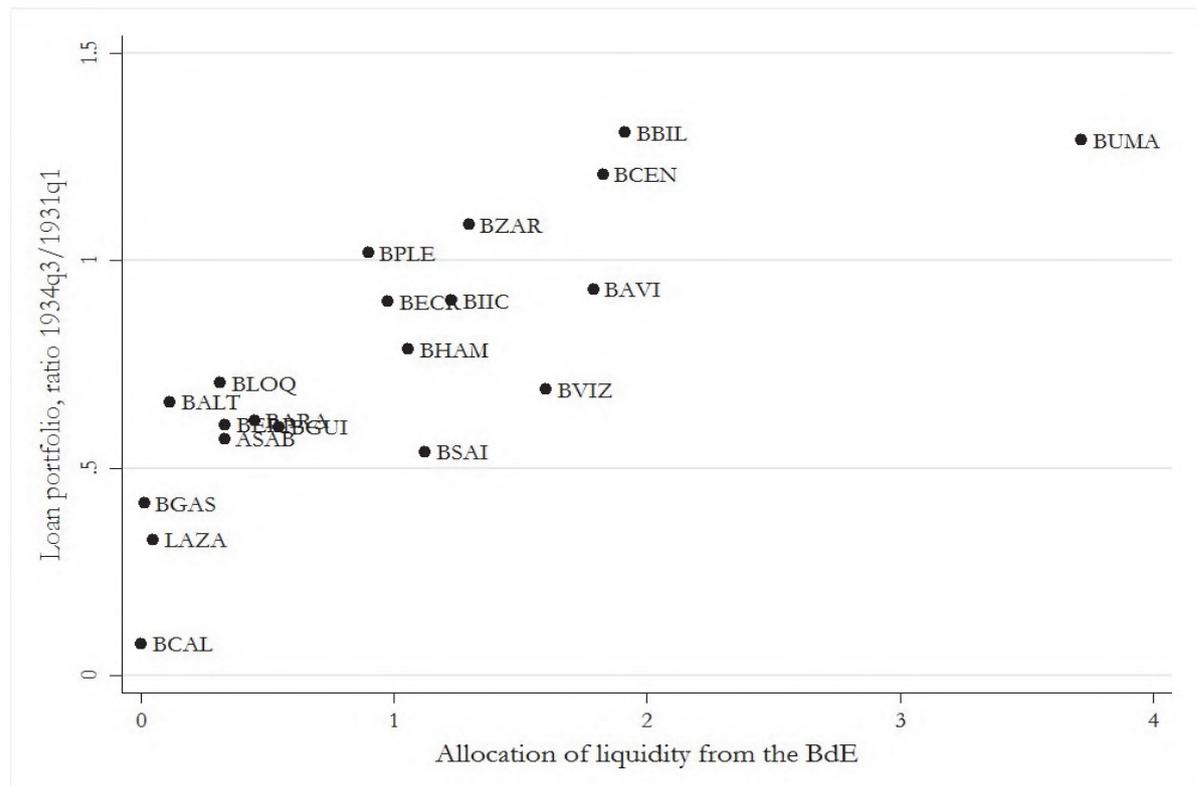
⁴⁸² See full paper for details.

⁴⁸³ Sardà and Beltran (1933; p.62).

⁴⁸⁴ See full paper for details.

⁴⁸⁵ See full paper for details.

Figure 4: Allocation of liquidity and long term evolution of lending



Source: author's database

Results of an OLS regression are presented in table 1 in order to control for other factors besides allocation. It shows that the correlation between allocation and long-term evolution of loans and assets is statistically and economically significant, even after controlling for outliers and how fast deposits returned to banks. Banks that received more liquidity during the crisis grew their way out of it faster. Results in column 2, imply that, after controlling for the pace at which banks recovered their withdrawn deposits, the average bank getting an allocation value of 1 would have resumed half of its lending capacity by 1935. A bank receiving an allocation value of 2 would have recovered almost 90 per cent of its loan portfolio in 1935. Columns 5 and 6 show that newly recovered deposits were used mostly to buy securities (mostly public debt) rather than lending, while the emergency liquidity provided by the BdE was used to expand lending (columns 1 and 2). Banks used the liquidity of the BdE to keep lending afloat and not to readjust their portfolio towards safer, more liquid securities. This suggests that the economy was not in a liquidity trap, profitable lending opportunities continued to exist and, therefore, a different distribution of liquidity could have improved the long term efficiency of the intervention.

Table 1: Allocation of liquidity and evolution of lending and portfolio composition

Ratio between 1934q3 and 1931q1						
	1	2	3	4	5	6
	Loans	Loans	Assets	Assets	Securities as % of loans	Securities as % of loans
Allocation in 1931q2-q3	0.268*** (5.6)	0.336*** (4.17)	0.122*** (3.72)	0.188*** (3.52)	0.074* (1.96)	0.020 (0.32)
Ratio of deposits 1934q3/1931q1	0.312* (1.91)	0.190 (0.95)	0.756*** (6.76)	0.639*** (4.83)	1.087*** (8.41)	1.184*** (7.48)
BUMA dummy		-0.349 (-1.04)		-0.337 (-1.53)		0.278 (1.06)
Intercept	0.233 (1.60)	0.288* (1.86)	0.109 (1.09)	0.162 (1.58)	-0.081 (7.30)	-0.126 (6.01)
R-Squared	0.70	0.72	0.81	0.83	0.83	0.84
Obs.	20	20	20	20	20	20

Source: author's database

Conclusion

During the 1931 banking crisis, the Banco de España could perform its role as LOLR without the limits imposed by currency convertibility. This operation has been largely regarded as a successful intervention because the BdE replaced almost entirely the deposits lost by the banking system with an equivalent liquidity injection. By exploiting new data collected from different archival sources, a close examination of the details of the intervention reveals interesting side effects and questions the efficiency and efficacy of the intervention.

The lack of widely known eligibility criteria and inefficient pricing of emergency liquidity encouraged many banks to borrow excess liquidity until the rediscount rate was raised. As a result, allocation of liquidity was biased, some banks receiving almost four times the amount of liquidity they lost through deposits, while others receiving barely the same amount. Banks that received more excess liquidity managed to recover from the crisis faster.

The findings of this paper suggest that the provision of emergency liquidity had significant distributional effects which had little to do with banks' fundamentals before the crisis. This ought to be considered when assessing the evolution of central banking in historical perspective, as aggregate magnitudes might be hiding interesting side effects of LOLR interventions with potential implications for the political economy of central bank development.

Family structure and the admission of children to the workhouse in post-famine Ireland

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1. Introduction

Analysis of workhouse populations is a growing field within poor law research. The increasing number of quantitative case studies of English workhouses has enabled the reconstitution of inmate populations and an evaluation of the role of the institution within destitute families' 'economy of makeshifts'.⁴⁸⁶ Irish workhouses have been analysed through a regional framework which has identified distinctive welfare regimes in the north, south, and west with notable divergence between centralized relief policies and local administrations.⁴⁸⁷ In this paper I apply such methodology to determine the significance of family structure on the admission of children to Irish workhouses.

2. Family structure and the Irish Poor Law

The Irish Poor Law of 1838 was centred upon the workhouse institution. Regimented conditions and the segregation of families upon admission were designed to create an environment less attractive than a life of independent labour outside the workhouse walls. Under this principle of 'less-eligibility,' the 'workhouse test' deterred all but the truly destitute from soliciting support from the ratepayers. Such ideology was reflected in a lack of statistical information within central authorities' reports on either the family background of children or the reasons, beyond simply 'destitution,' for which a family required poor relief.'

Figure 1 illustrates authorities' classification of children aged under fifteen relieved in the workhouse with either able-bodied, aged/infirm, or no parents for the half-year periods of each census year, 1850/1-1900/1.⁴⁸⁸ The long-term trend shows children of able-bodied parents increasing as a proportion of all children from 57.5 per cent in Mar-Sep. 1851 to 74.2 per cent in Mar-Sep 1901, and a concurrent reduction in unaccompanied children from 39.0 per cent to 19.4 per cent in the same half-years. In absolute terms, the number of children in receipt of indoor relief declined from 224,656 (44.2 per cent of all recipients) in Mar-Sep. 1851 to 35,723 (18.1 per cent) by Mar-Sep. 1901. Considered together, these changes indicate a shift in the family background of child inmates and their reasons for admission.

In contrast, without a workhouse test, outdoor relief applicants were subject to stricter classification of their family circumstances. Introduced during famine conditions in 1847 in response to workhouse overcrowding, local officials were empowered to provide outdoor relief to specific 'deserving' classes: families with a disabled or sick head of household, and widows with two or more legitimate children. Outdoor relief accounted for only 10,699 children in Mar-Sep. 1851 (37.7 per cent were of disabled fathers, 19.7 per cent of disabled mothers, and 40.7 per cent of widows). Despite an expansion of outdoor relief from the early 1880s, it remained as a minority of relief (from c.6.0 per cent of all relief recipients in 1850/1 to c.32 per cent between 1881-1901).⁴⁸⁹

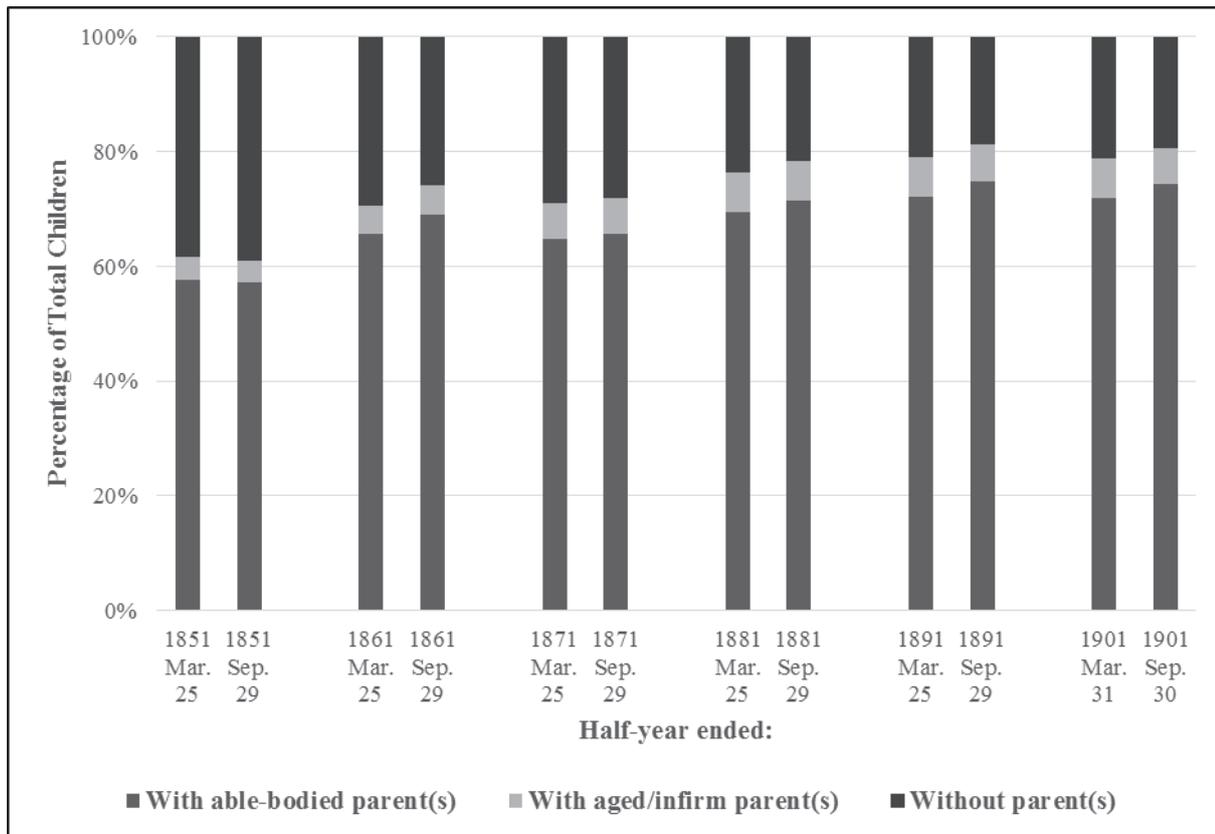
⁴⁸⁶ For workhouse case studies, see *Local Population Studies*: Hinde and Turnbull (1998); Goose (1999); Jackson (2002), (2005); Perkyms (2008); Gritt and Park (2011); Darwen (2014). For 'economy of makeshifts,' see: Hollen Lees, *The solidarities of strangers* (1998); King and Tompkins (eds), *The poor in England: an economy of makeshifts* (2003).

⁴⁸⁷ See chs in Crossman and Gray (eds), *Poverty and welfare in Ireland* (2011): Laragy, 'Poor relief in the south of Ireland, 1850-1921'; Lucey, 'Poor relief in the west of Ireland, 1861-1911'; Purdue, 'Poor relief in the north of Ireland, 1850-1921.'

⁴⁸⁸ 'Census' years correlate with the poor law administrative year of October-September inclusive.

⁴⁸⁹ For outdoor relief, see Crossman, *Poverty and poor relief* (2013), pp.63-100.

Figure 1: Parental classification (%) of children in receipt of indoor relief in Ireland during the half-year periods of each census year, 1850/1-1900/1



3. Family structure in workhouse registers

It is only through local sources, specifically workhouse admission and discharge registers, that the family structure of relief recipients may be ascertained. These registers are the main source for identifying individual children, their family relationships, and the reasons for which relief was accessed. Each register entry includes details of name, age, sex, occupation, last place of residence, observations on health or appearance, and, in most cases, a corresponding date of discharge or death. Workhouse registers were generally recorded in a uniform manner but inconsistencies did occur in urban unions where a high turnover of inmates contributed to poor bookkeeping.⁴⁹⁰ For this study, each child entry was transcribed into a database with additional categories for any parental information including marital status, age, and occupation. My project covers the registers of six workhouses for the census years between 1850/1 and 1910/11 (where available). These were selected based upon register availability, regional spread, and for rural-urban comparison.

Figure 2 and table 1 provide an example of this analysis for the four workhouses of Ballymoney, Belfast, North Dublin (NDU), and Thurles for 1870/1 and 1900/1.⁴⁹¹ Children have been categorized into ‘no parents,’ ‘mother only,’ ‘father only,’ and ‘both parents’ classes. In line with national statistics, all four unions exhibited an increase in the percentage of children accompanied by parents and a decline in the percentage of unaccompanied children. The rate was most pronounced in the southern unions of North Dublin and Thurles which fell from 32.5 and 33.3 per cent to 16.2 and 9.6 per cent respectively. Much of this reduction relates to the admission of fewer orphaned and deserted children. The majority of

⁴⁹⁰ The Belfast workhouse master was often ‘bamboozled’ by the ‘mythical names returned on the books’. *Belfast Newsletter*, 20 November 1880.

⁴⁹¹ For Belfast, the July-March 1864/5 register has been used in place of the lost 1870/1 register. The next available Belfast register is November-March 1877/8.

unaccompanied children admitted to the workhouses by 1900/1 were hospital patients. In the more prosperous Antrim unions, such a change had occurred soon after the Famine. Most orphans left Ballymoney between 1850/1 and 1860/1 when the unaccompanied proportion fell from 40.0 to 13.4 per cent, while at Belfast 47.9 and 51.3 per cent of unaccompanied children in 1864/5 and 1900/1 respectively were admitted for hospital treatment.

Figure 2: Parental classification (%) of children admitted to the workhouses of Ballymoney, North Dublin, and Thurles, 1870/1 and 1900/1, and Belfast, 1864/5 and 1900/1

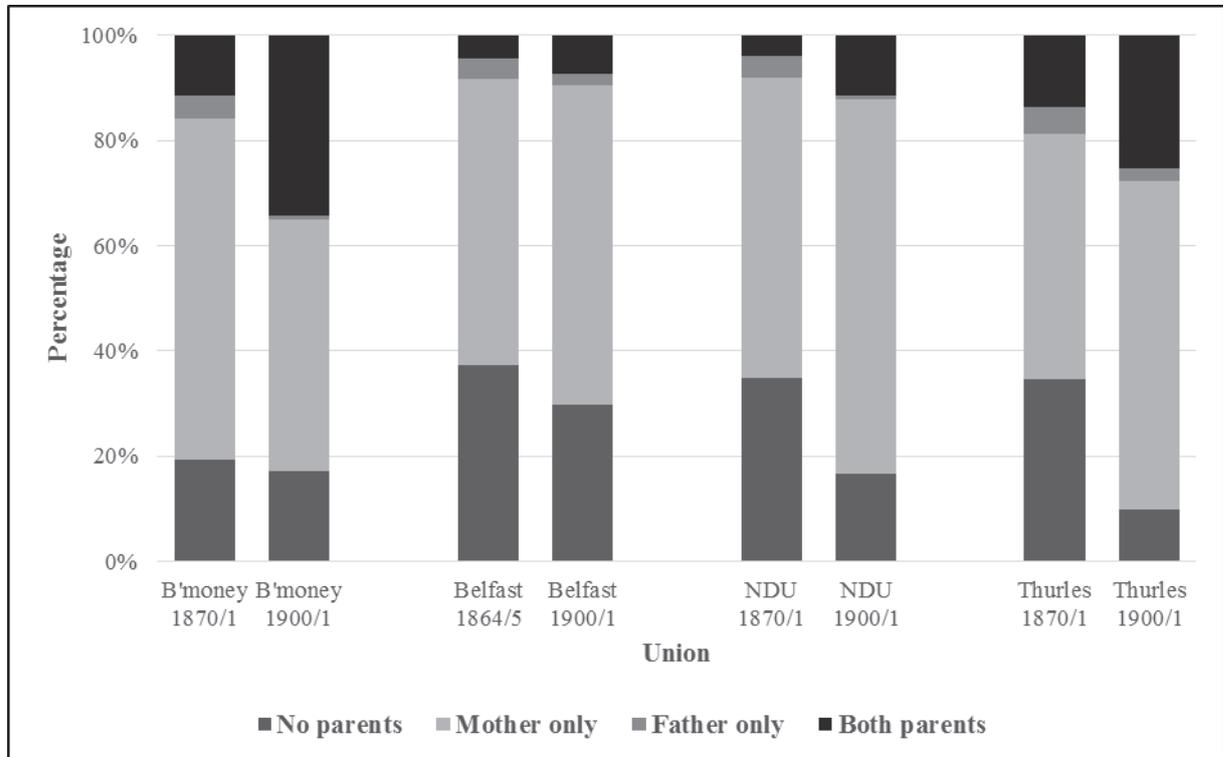


Table 1: Parental classification of children admitted to the workhouses of Ballymoney, North Dublin, and Thurles, 1870/1 and 1900/1, and Belfast, 1864/5 and 1900/1

	Ballymoney		Belfast		North Dublin		Thurles	
	1870/1	1900/1	1864/5	1900/1	1870/1	1900/1	1870/1	1900/1
No parents	22	29	447	988	283	571	61	44
Mother only	74	81	649	2024	465	2434	82	280
Father only	5	1	48	77	34	26	9	11
Both parents	13	58	52	241	31	388	24	113
Total	114	169	1196	3330	813	3419	176	448

‘Both parents’ family groups represented only 5.6 and 9.0 per cent of all families in Belfast and North Dublin respectively in 1900/1, as distinct from the proportion of children. These families were of a greater average size: 1.9 children per ‘both parents,’ compared with 1.6 children per ‘father only,’ and 1.5 children per ‘mother only’ groups. Many were in-migrant families recorded in the registers as having travelled from outside the union. They possibly used the workhouse as temporary accommodation until employment and alternative lodgings were found. The more substantial increase in the rural unions, representing c.25-33 per cent of families by 1900/1, was caused by the same impoverished migrant families who, with no law of settlement to contend with, made use of rural workhouse accommodation while travelling in search of work in Belfast, Cork, Dublin, or Britain.

From the viewpoint of local officials, this practice by migrant families undermined the workhouse test. Authorities doubted the destitution of such families and often termed them

vagrants in search of relief hand-outs rather than work. This ‘problem’ increased during the post-famine period, particularly in Ulster, with the concurrent expansion of Belfast and contraction of the agricultural labour sector.⁴⁹² For Antrim workhouse officials whose workhouse was ‘on the main trunk road from Belfast to the northern counties’ it required ‘the utmost vigilance ... to discriminate between the really destitute (whom they are always prepared to relieve) and vagrant tramps whom they are equally anxious to prevent becoming a charge upon the union’.⁴⁹³ Here was one example where the relief which authorities believed they could or should provide did not match the welfare demands or needs of labouring class families.

A rural-urban divide existed between the four unions in question.⁴⁹⁴ This divide was partly reflected by the sheer scale of admissions to Belfast and North Dublin compared with Ballymoney and Thurles, as detailed in table 1. But additionally, the distinctions between rural and urban poverty influenced how families made use of the workhouse as a welfare resource. In all unions, children of single-parent families predominated. ‘Father only’ families were a small minority. With the oldest average age of children among workhouse family groups coupled to the ideological standpoint of authorities against the relief of able-bodied men, they at once, perhaps, had less need but also less access to relief. Similarly, children of ‘mother only’ were the single largest group in all four unions: their proportion ranging in figure 2 from 44.8 per cent at Thurles, 1870/1, to 69.0 per cent in North Dublin, 1900/1. But the relationship differed between ‘mother only’ families and urban or rural poor relief.

The over-representation of female to male workhouse inmates, on average between two and three to one, coupled with the long length of stay of ‘mothers only’ families, concerned poor law authorities. Officials complained that married mothers and their children sought relief while their husbands earned wages elsewhere.⁴⁹⁵ Furthermore, the Poor Law Commissioners noted that female pauperism was ‘less liable to fluctuation through the prosperous or adverse circumstances of the population’ with many unmarried mothers ‘who cannot obtain employment through loss of character’ or ‘rendered destitute by pregnancy, or as mothers of illegitimate children’.⁴⁹⁶ Thurles officials claimed that mothers seemed reluctant to leave the workhouse with their children. They concluded that, ‘There must be some attraction (whatever it may be) within the workhouse walls besides the scanty food and loan of clothes of which the guardians are not cognizant’.⁴⁹⁷ Much of this ‘reluctance’ may be attributed to authorities’ insistence, particularly regarding unmarried mothers, that all children were taken out upon discharge. However, rural female employment opportunities were limited which prevented many mothers from supporting their children outside.

The high demand for female industrial employment in Belfast provided labouring-class mothers a greater capacity to maintain themselves outside the workhouse. Figure 3 details the listed occupations of all mothers admitted to the Belfast workhouse during 1900/1. Of 1,107 mothers, 32 had no stated occupation in the register (a further 118 were listed as prostitutes, but this term was used liberally by officials). Mill work provided employment for 49.7 per cent of all mothers and 42.5 per cent of unmarried mothers. This contrasts with other workhouses where the majority of women had no stated occupation. At North Dublin, domestic service was the largest employment sector for unmarried mothers (98.2 per cent were employed 1870/1). But listed employments were former employments. As Williams

⁴⁹² Fitzpatrick, ‘The disappearance of the Irish agricultural labourer, 1841-1912’, *Irish Economic and Social History*, 7 (1980), pp.66-92.

⁴⁹³ Antrim Board of Guardians Minute Book. December 1859, PRONI, BG/1/A/8.

⁴⁹⁴ Purdue labels the rural-urban divide as ‘possibly the clearest line of demarcation which can be drawn in terms of the development of welfare practices in late-nineteenth-century Ireland’, Purdue (2011), p.35.

⁴⁹⁵ *Freeman’s Journal*, 22 September 1910.

⁴⁹⁶ *Fourteenth annual report of the commissioners for administering the laws for relief of the poor in Ireland, with appendices*, [2803], H.C. 1861, xxviii, 305, pp 11-12.

⁴⁹⁷ Thurles Board of Guardians Minute Book. March 1861, Tipperary Local Studies, BG/151/A/33.

notes, domestic servants often lost their place due to pregnancy and found it difficult to regain employment.⁴⁹⁸ At Belfast, however, industrial mill employment enabled women to find re-employment at a faster rate.

Figure 3: Occupations of mothers admitted to the Belfast workhouse, 1900/1

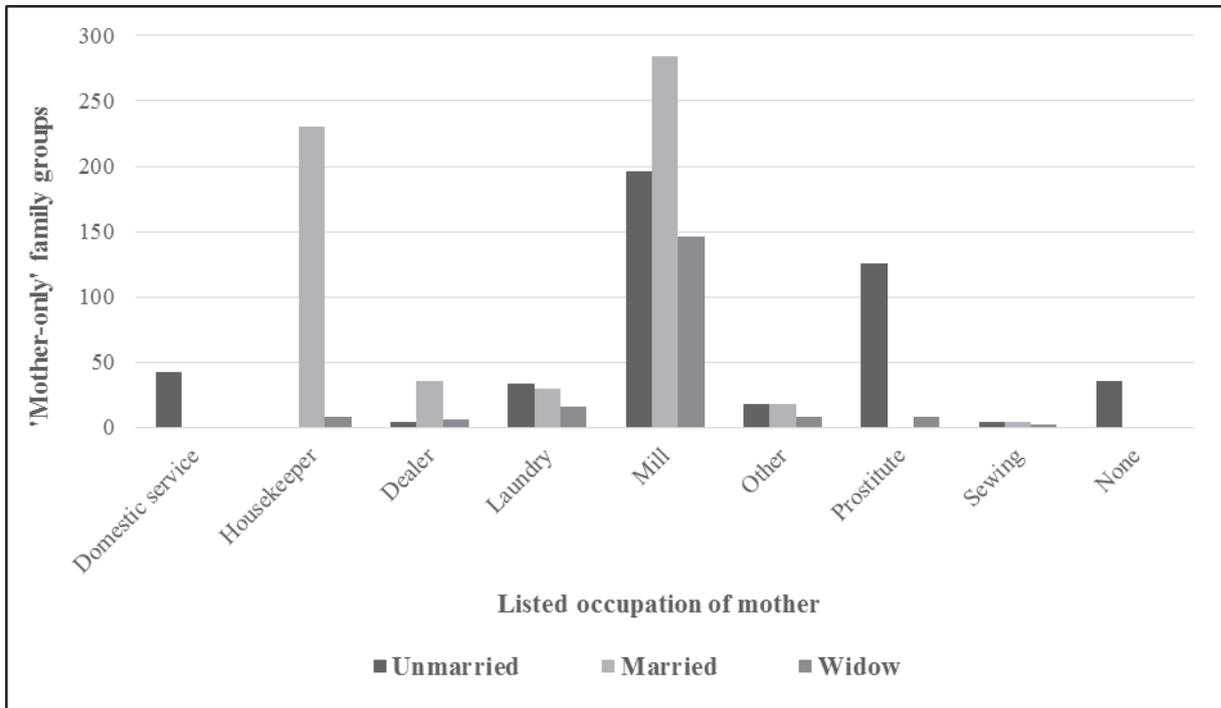


Table 2: Length of stay by parental classification (%) of children admitted to the Belfast workhouse, 1900/1

	Total	No parents	Mother only	Father only	Both parents
1-2 days	10.0	6.0	10.6	13.1	25.7
3-6 days	18.7	18.2	18.2	8.7	20.7
1 week - 1 month	37.2	24.9	39.8	43.5	31.7
1-6 months	24.1	35.1	22.4	21.7	20.7
6 months +	5.2	7.7	5.2	8.7	0.0
Died	4.8	8.1	3.8	4.3	1.2

Table 2 indicates the length of stay of children of each family type at Belfast workhouse, 1900/1. The majority of children, 71.3 per cent, resided in the workhouse for one week or longer. However, family structure was a key determinant of a child’s length of stay. Children with ‘both parents’ tended to reside for shorter periods with 46.4 per cent for less than one week. Unaccompanied children remained longest and the majority of single-parent children, 62.2 and 65.2 per cent of ‘mother only’ and ‘father only’ respectively, resided for between one week and six months. At Ballymoney, 1900/1, however, all ‘both parent’ families left within two days as many were travelling. Additionally, ‘no parents’ and ‘mother only’ groups remained for longer periods than at Belfast which reflected a higher proportion of orphaned children and fewer female employment opportunities.

⁴⁹⁸ Williams, “I was forced to leave my place to hide my shame”: the living arrangements of unmarried mothers in London in the early nineteenth century’ in McEwan and Sharpe (eds), *Accommodation poverty* (2011), pp.191-220.

4. Limitations of workhouse registers

There are limitations in the use of workhouse registers to determine the family structure of workhouse inmates. The main problem concerns readmissions for which statistic measurements are difficult. In 1908, a report on readmissions calculated that 83.3 per cent of indoor relief recipients in Ireland were relieved only once.⁴⁹⁹ But this measurement may have overlooked those individuals who changed their name or moved between workhouses. For my project, readmissions cause a problem due to the fluidity of family forms. Family composition upon admission was not necessarily its composition outside the workhouse. Temporary periods of family dissolution were a survival strategy. Part of the family may have entered the workhouse when the maintenance of the whole was not possible. Community support was enlisted for the care of children also.⁵⁰⁰ Additionally, Purdue argues, some families presented themselves in a form which they believed officials would have perceived as more deserving.⁵⁰¹

Another problem is the absence of families to whom local officials refused relief based upon moral or vindictive considerations on top of the workhouse test of destitution. Children of unmarried mothers were particularly affected by the stigmas of illegitimacy and assumed prostitution which threatened their access to relief. Although the Belfast union chairman claimed ‘we have nothing to do with character in considering the granting of relief,’ an inquiry in 1881 uncovered numerous occasions when Belfast workhouse officials refused admission to women and children who appeared late at night.⁵⁰² The workhouse porter defended his refusal to admit a woman and infant in July 1871 as ‘should her child have died during the night, whilst the mother was earning the wages of infamy, I would consider the mother alone responsible’.⁵⁰³

5. Conclusion

Such limitations cannot be overcome by quantitative methods and must remain as anecdotal qualifications. Family structure, however, is a necessary term of reference in considering the admission of children to the workhouse. As Levene argues, any study of children or childhood ‘makes little sense’ without consideration of the family.⁵⁰⁴ Indeed, Irish central authorities’ lack of information on children’s family background led to a disconnect between the type of child in the workhouse and the form of relief provided, especially in the provision of education. Further research on the divergent roles of the Irish workhouse within official ideology and destitute families’ economies of makeshifts is required.

⁴⁹⁹ *Return showing for each poor law union in Ireland, the number of men, women, and children who were in receipt of relief at any time during the year ended 31st March 1908*, [Cd 306], H.C. 1908, xcii, 773.

⁵⁰⁰ The 1864/5 Belfast register records that many children were taken out by friends or neighbours.

⁵⁰¹ Purdue, ‘“A gigantic system of casual pauperism”: the contested role of the workhouse in late nineteenth-century Belfast’, in Althammer et al. (eds), *The welfare state and the ‘deviant’ poor in Europe* (2014), pp.42-44.

⁵⁰² *Minutes of evidence taken at the inquiry held at the Belfast workhouse*, [C 123], H.C. 1881, lxxix, 69, p.4.

⁵⁰³ Belfast Board of Guardians Minute Book. July 1871, PRONI, BG/7/A/34.

⁵⁰⁴ Levene, *The childhood of the poor* (2012), p.21.

Employment and retirement in old age in England and Wales, 1851-1911

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While previous studies of employment and retirement in old age have deployed sampling techniques or made use of published census abstracts, this paper benefits from machine readable versions of the raw census enumerators' books (CEBs) transcribed through the Integrated Census Microdata (ICeM) project completed in 2013. Therefore, this paper presents a systematic and comprehensive analysis of raw CEB data to analyse changing patterns of employment and retirement for men and women aged 60 and over in England and Wales from 1851 to 1911 (excluding 1871).

Previous literature on employment in old age presents quantitative estimates. Matthew Woollard estimates that the male labour force participation rate (LFPR) for those over 60 increased from near 77 per cent to 79 per cent between 1851 and 1881.⁵⁰⁵ Also, Paul Johnson reports a decline in male LFPR began in 1891 for those aged 65 and over, attributed to a fall in the proportion of agricultural workers.⁵⁰⁶ In terms of elderly women's work, details are relatively sparse. Eilidh Garrett's analysis of women's work from 1891 to 1921 shows that the LFPR of females aged 65 and over declined, which could be due to the greater reliance on relatives for support and a tendency for later censuses to less well capture the activities of elderly women.⁵⁰⁷

Studies on retirement have not been carried out in a similarly quantitative fashion. It is presumed that the proportion of those retired towards the twentieth century was limited and confined mainly to the upper and middle classes. For the working classes, budgets were too meagre to permit substantial savings and retirement was therefore synonymous with unemployment and poverty. Retirement as a concept was not in wider use before the advent of old age pensions in the early twentieth century.⁵⁰⁸

The major aims of this paper are as follows. Firstly, I compare employment and retirement rates among both elderly men and women. Subsequently, a study of occupational transitions leading to either an independent retirement or a retirement characterized by unemployment and poverty will show that voluntary retirement as a concept was more prevalent before the advent of old age pensions than previously recognized.

Methodology

Five selected counties are represented as case studies, drawn from four regions of England and one in Wales. They are Hertfordshire (in the east of England); Cheshire (Midlands); Hampshire (south); parts of Yorkshire West Riding (north) and Glamorgan (the Welsh county). Unlike the original CEBs, occupational codes have been devised for each recorded textual occupation in the ICM datasets. The occupational codes have been collated into 23 main occupational groups on the ICM search facility available at www.icem.data-

⁵⁰⁵ M. Woollard, 'The Employment and Retirement of Older Men, 1851-1881: Further Evidence from the Census,' *Continuity and Change*, 17 (2002), pp.437-63. Figures for men aged 60 and over calculated from Table 3, p.445.

⁵⁰⁶ P. Johnson, 'The Employment and Retirement of Older Men in England and Wales, 1881-1981,' *Economic History Review*, 47 (1994), pp.106-128.

⁵⁰⁷ E. Garrett, 'The Dawning of a New Era? Women's Work in England and Wales at the Turn of the Twentieth Century,' in N. Goose (ed.), *Women's Work in Industrial England: Regional and Local Perspectives* (Hatfield, 2007), pp.314-62.

⁵⁰⁸ L. Hannah, *Inventing Retirement: The Development of Occupational Pensions in Britain* (Cambridge, 1986), pp.5-7; J. Quadagno, *Aging in Early Industrial Society: Work, Family and Social Policy in Nineteenth-Century England* (London, 1982), pp.166-7.

archive.ac.uk, with one group comprising those unoccupied or without a specific occupation. The percentages of men and women over 60 in each of the 23 occupational groups were then calculated by county.

Those enumerated as 'retired' or 'ret'd' were used to analyse retirement. Further work will incorporate those described as 'formerly' employed and 'out of work'. The proportions of the overall elderly population described as 'retired' were calculated by Superintendent Registration District (SRD). To demonstrate occupational-specific transitions that led either to voluntary retirement or pauperism in old age, the proportions of 'retired' and 'paupers' by occupational group was analysed.⁵⁰⁹

There are methodological problems when using CEBs. The retired were not treated as a separate category until 1881, which may underestimate the proportions of retired before 1881. The occupations given by workhouse populations were also incorporated by contemporaries before 1891 in the numbers actively working, thereby overestimating LFPRs. An adjusted LFPR involves subtracting from the numbers of those actively working, those in institutions or recorded as retired but listed as actively working.⁵¹⁰ However, locating workhouse populations through the ICeM datasets is difficult as not all workhouses are textually acknowledged. Therefore, this paper analyses an unadjusted LFPR.⁵¹¹ Furthermore, an 'inactive' code flags up those enumerated as 'retired' but occupationally coded, although not all retired are coded appropriately. Those individuals have thus been included in the LFPR for all periods, assuming no major distortion.

Employment

Table 1 shows the LFPR of men aged 60 and over in the selected counties, with the changing percentages of those working in 13 of 22 occupational categories, nine of these combined into 'Other'. There are some parallels with Woollard's research as male LFPR increased towards 1881, with a peak employment rate of 92.5 per cent, allowing for some overestimation. This is identical to the 92.6 per cent noted for England and Wales overall. The decline in LFPR from 1891, marked more severely between 1881 and 1891 before steadily decreasing afterwards, reflects Johnson's work. The dramatic fall in LFPR between 1881 and 1891 is primarily explained by the decline in agriculture. If agriculture is excluded, the LFPR in 1891 falls slightly at 67.1 per cent from 68.3 per cent in 1881. For textiles, the proportions also fell; the most severe fall by county was in Cheshire, where 12.6 per cent of elderly men worked in textiles in 1891, compared with 6.5 per cent in 1901. The fall in silk weaving was partly responsible: 34.4 per cent of male workers in Cheshire practised as silk weavers in 1891 compared with 21.6 per cent in 1901. This may reflect the general decline in silk manufacturing by the late nineteenth century, attributed to increased imports from France.⁵¹²

⁵⁰⁹ I am aware that definitions of 'retired' and 'pauper' change over time across each census period, see Woollard, 'Employment and Retirement,' pp.439-40, 442-4.

⁵¹⁰ Woollard, 'Employment and Retirement', pp.442-4.

⁵¹¹ Early adjusted labour rates for Cheshire and Yorkshire West Riding in 1851 show a male LFPR aged 60 and over of 81.5% and 85.3% respectively, closer to Woollard's 1851 figure of 76.7% than the unadjusted rates of 90.2% and 91.5% respectively.

⁵¹² F. Crouzet, (trans. A. Forster), *The Victorian Economy* (London, 1982), pp.220-1.

Table 1: *Labour force participation rate of men aged 60 and over in Cheshire, Glamorgan, Hampshire, Hertfordshire and parts of Yorkshire West Riding, 1851-1911*

Five Counties	1851	1861	1881	1891	1901	1911
Agriculture	34.1	33.1	24.1	21.7	18.5	13.0
Dom. Services	1.2	1.6	2.6	2.1	3.2	3.3
Textiles	4.5	4.3	3.7	3.2	3.1	2.3
General Workers	9.1	8.9	12.0	12.3	9.2	9.8
Dress	5.3	5.2	5.6	4.5	4.1	3.1
Food/Drink	5.6	5.8	6.6	6.4	6.6	5.7
Building	6.6	6.2	7.3	7.0	8.5	8.8
Conveyance	4.3	5.2	6.0	6.2	6.9	8.3
Metals/Machines	7.0	7.0	8.6	8.3	9.2	9.8
Prof. Occup's	2.2	2.0	2.8	2.7	2.9	3.2
Mines/Quarries	2.5	2.9	4.2	5.4	3.1	6.8
Wood/Furniture	2.0	1.8	1.7	1.7	1.8	1.6
Commercial	1.1	1.4	1.9	1.9	2.4	3.4
Other	4.5	4.4	5.3	5.3	6.9	6.7
N. Occupied	45009	52586	76005	71078	78744	116064
% Occupied	89.9	89.7	92.5	88.5	86.3	85.9

Notes: 'Other' combines the occupational variables of Government, Chemicals, Skins/Leather, Brick/Cement/Pottery/Glass, Paper/Prints, Jewels/Watches, Defence, Fishing, and Gas/Water.

Source (for all tables): Integrated Census Microdata Datasets, 1851-1911, excluding 1871.

Interestingly, the building, metal/machines, professional and conveyance trades saw a rise in male LFPR. In the building trade, bricklaying and house painting increased by 2 percentage points and 3 percentage points respectively from 1901 to 1911. Elderly men were more likely to participate in the conveyance trade in 1911 than in 1851, as evident through a rise in dock labourers, especially in the maritime SRDs of Cardiff (Glamorgan), Birkenhead (Cheshire) and Southampton (Hampshire). As for professional occupants, commercial travellers, or salesmen, increased by 2 percentage points from 1901 to 1911. Overall, it seems that, in contrast to John Macnicol's argument that changing technology in late Victorian Britain diminished the elderly workforce, elderly men were adapting to an economy that was becoming more urbanized over time.⁵¹³

⁵¹³ J. Macnicol, *The Politics of Retirement in Britain, 1878-1948* (Cambridge, 1998), p.22.

Table 2: *Labour force participation rate of women aged 60 and over in Cheshire, Glamorgan, Hampshire, Hertfordshire and parts of Yorkshire West Riding, 1851-1911*

Five Counties	1851	1861	1881	1891	1901	1911
Agriculture	4.6	3.4	2.5	1.3	1.4	0.9
Dom. Services	10.8	12.2	12.3	8.3	8.1	7.2
Textiles	1.8	1.7	1.5	1.1	1.1	0.7
General Workers	1.1	1.0	1.0	0.7	0.6	0.8
Dress	2.3	3.4	4.0	3.0	2.4	1.4
Food/Drink	2.9	3.1	3.4	3.0	3.1	2.5
Building	0.3	0.1	0.1	0.1	0.1	0.1
Conveyance	0.3	0.3	0.2	0.1	0.1	0.1
Metals/Machines	0.4	0.5	0.3	0.4	0.4	0.4
Prof. Occup's	2.6	2.3	2.0	1.4	1.3	1.3
Other	1.2	1.1	1.1	0.7	0.7	0.8
N. Occupied	15959	18678	26586	19065	21886	26582
% Occupied	28.2	29.0	28.7	19.9	19.4	16.3

Notes: 'Other' combines the occupational variables of Mines/Quarries, Wood, Government, Chemicals, Skins/Leather, Brick/Cement/Pottery/Glass, Paper/Prints, Jewels/Watches, Defence, Fishing, and Gas/Water.

Table 2 shows the LFPR of women aged 60 and over, with 11 groups combined into 'Other'. The LFPR rate peaked in 1861 at 29.0 per cent, compared with 30.9 per cent in England and Wales overall, before a heavy decline was noted between 1881 and 1891, similar to the male LFPR. Employment in domestic service fell by four percentage points between 1881 and 1891. A huge fall for those in the group 'Other Domestic Indoor Servants – Undefined', partly explains the general decline. The proportions of these persons enumerated as 'Head' reached 31.3 per cent in 1881, compared with 18.3 per cent in 1891. The majority of these 'Heads' were enumerated as housekeepers. This description was generally miscategorized by census abstractors analysing the CEBs. Heads of household performing domestic duties at home and not resident in the households of their masters were described as 'housekeepers' and subsequently classified as domestic servants.⁵¹⁴ When the 'Heads' in that group were excluded between 1881 and 1891, there was a 2.8 percentage point reduction in domestic service, compared with 4 per cent generally.

The dress trade also faced a dramatic downturn, especially in Hertfordshire, the site of the straw plaiting and hat manufacturing trade. The data are consistent with a decrease in the overall numbers working in that trade towards the twentieth century in Bedfordshire, Buckinghamshire and Hertfordshire, owing to cheap imports from Asia.⁵¹⁵

Retirement

The proportions of elderly men and women enumerated as 'retired' in 1851, 1891 and 1911 in the five selected counties are shown in table 3. For both men and women, an increase is most noticeable between 1851 and 1891, when the retired became a distinct category for contemporary analysis. Owing to the introduction of old age pensions in 1908, there was a steady increase in 1911 from 1891 for elderly men. Some regional patterns are revealed in

⁵¹⁴ E. Higgs, 'The Tabulation of Occupations in the Nineteenth-Century Census, with Special Reference to Domestic Servants,' *Local Population Studies*, 28 (1982), pp.58-66; M. Anderson, 'Mis-specification of Servant Occupations in the 1851 Census: A Problem Revisited,' *Local Population Studies* 60 (1998), pp.58-64.

⁵¹⁵ N. Goose, *Population, Economy and Family Structure in Hertfordshire in 1851, Vol. 2: St. Albans and its Region* (Hatfield, 2000), Table 6, p.71.

1851 and 1891 as elderly men in Cheshire and the West Riding were more likely be marked as 'retired' than in Glamorgan and Hertfordshire. This becomes complicated by 1891 when Hampshire had the highest rates of elderly male retirement and Hertfordshire eclipsed the West Riding in 1911. In all periods, Glamorgan contained the lowest proportions of men and women retired. Retirement for women was also stable throughout 1851-1911, although women in Cheshire were more likely than other counties to be recorded as retired.

Table 3: *Percentages of men and women aged 60 and over recorded as 'retired' in selected counties, 1851, 1891 and 1911*

Counties	1851		1891		1911	
	M	F	M	F	M	F
Cheshire	5.6	1.5	11.0	2.2	15.7	1.4
Glamorgan	0.6	0.3	6.8	1.2	9.7	0.7
Hampshire	4.2	1.0	13.2	1.6	15.4	1.1
Hertfordshire	3.0	1.1	7.7	1.5	12.6	1.4
West Riding	4.8	1.1	10.4	1.6	12.5	1.1
TOTAL	3.0	0.8	10.4	1.7	13.4	1.1

Johnson's argument that 'a very small minority' retired independently before the twentieth century is questionable.⁵¹⁶ In fact, male retirement by SRD was remarkable compared with the five counties' average. In 1891 Hampshire, 22.1 per cent and 19.3 per cent of elderly men in Portsea Island and Christchurch SRD respectively were marked as retired. By 1911, 27.1 per cent of elderly men in Christchurch were retired. Occupational analysis of Christchurch in 1891 shows that the majority of retired men were army officials, farmers and grocers/tea dealers. In 1911, army officials, men of the navy and farmers represented the majority of retired men. In this case, maritime economies are responsible for a spatial concentration of retired elderly men.

In the five counties in 1851 and 1891, the majority of elderly men marked as 'retired' participated as farmers and the food/drink trade. In Cheshire, retired men were prominent in textiles, particularly in tailoring. In the West Riding, they retired from metals/manufacturing, especially in blacksmithing, associated with the steel trade. By 1891, over 10 per cent of retired men in Hampshire worked in metals/manufacturing and near 14 per cent of Glamorgan's retired men were involved in mining. Elderly women were more likely to retire from domestic service, the food/drink trade and the dress trade. In terms of 'paupers' in 1851, the majority worked in agriculture, textiles and general labouring. However, male 'paupers' were more likely to be agricultural labourers than the 'retired'. In 1851, 0.4 per cent of retired elderly men worked as agricultural labourers, compared with 2.2 per cent in 1891. In textiles, male 'paupers' were more likely to be handloom weavers, reflecting the dislocation of handloom weaving after the growth of power machinery.⁵¹⁷ For female 'paupers' in domestic service, they were more likely to be charwomen or laundresses than the 'retired'.

An occupational analysis shows that the association of retirement before the twentieth century with poverty is not entirely valid. In fact, the negative relationship between the percentages of elderly men 'retired' in the 1891 CEBs against the proportions of elderly men receiving poor relief on 1 January 1891 by SRD in the five counties is highly significant.⁵¹⁸

⁵¹⁶ P. Johnson, 'Parallel Histories of Retirement in Modern Britain,' in P. Johnson and P. Thane (eds.), *Old Age from Antiquity to Post-modernity* (London, 1998), pp.211-25, quote on p.220.

⁵¹⁷ Crouzet, *Victorian Economy*, pp.198-202.

⁵¹⁸ Parliamentary reports take the numbers of able-bodied and non-able-bodied (the latter presumably the elderly) receiving indoor and outdoor relief on 1 January and 1 July from 1858 to 1912. Derived from British Parliamentary Papers, *Pauperism (England and Wales), Return (B), Paupers Relieved on 1st January 1891* (1892) 130-(B). Pearson's $r = -0.427$ where $p < 0.01$ with 63 cases.

Therefore, historians' definition of retirement before the twentieth century differs from that of their nineteenth-century contemporaries, who generally defined 'retirement' as voluntary.

Conclusion

This paper has revealed similar findings to Johnson and Woollard. Male and female LFPRs declined from 1891 after increasing from 1851 to 1881, owing to the fall in agricultural work for men and domestic service for women. Despite this, the increasing participation of elderly men in the building, conveyance, and professional occupations by 1911 meant that elderly men were adapting to a more urbanized workforce. Furthermore, retirement did not mean a descent in poverty for those in specific occupations, such as for farmers, those in the food and drink trade and in domestic service. In fact, there was a higher concentration of retired elderly men than previously argued, most notably in the maritime economies of Hampshire. Despite the multiple definitions of 'retirement', voluntary retirement was practised more widely in certain societies across England and Wales than the past literature assumes.

‘Regressive’ redistribution and infrastructure development in Portuguese Mozambique, 1890s-1970s

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Summary

This paper aims to shed light on the impact of fiscal policies on inequality in Mozambique, one of the two main Portuguese colonies. Income tax as well as investments on public services are considered as progressive elements of fiscal systems in the Western world. In present societies income redistribution takes place via both taxation and investments on public services, accessible to the lower income groups. However, in a colonial setting the aforementioned redistribution mechanisms have often been used in a reverse way: to transfer wealth from the lower social classes to the upper ones. Social classes in the colonies obtained certain spatial and racial characteristics. This paper provides insight into the regressive redistribution effects of taxation and public investments in Portuguese Africa. Novel quantitative and qualitative evidence is retrieved from primary sources such as administrative reports, statistical yearbooks, national accounts and maps of the colonial era (found in various archives located in Portugal and Mozambique). After the establishment of the colonial state and tax collection mechanisms in the late nineteenth and early twentieth century, the principal source of revenue for Portuguese administration was direct taxation and especially “indigenous” taxation, in the form of household or personal taxes at fixed rates. In parallel, the colonial state shifted its attention from security and administration to infrastructure, while only in the late colonial years (1950s-1970s) made considerable investments in social services such as education and health. In this framework, the Portuguese rule aimed at the maintenance and expansion of the railway and road network to meet a series of objectives: to facilitate the trade with the metropole and the surrounding British colonies, by connecting the mainland with selected urban centres and ports along the coastline; to boost labour migration from the southern zone of Mozambique to the mines of South Africa and Rhodesia; and to simplify the movement of the military troops. By investing in infrastructure, the colonial state – along with chartered companies – did not benefit the majority of Africans, who lived mostly in rural areas, with the north being the most densely populated zone. The benefits drawn from public infrastructure depended on the location and citizenship status of Mozambican residents (Africans, non-Africans). As a result, spatial and racial divisions were reproduced and inequalities between white settlers and indigenous people rose in Portuguese Mozambique during colonial times.

Taxation and public investments in colonial Africa

The “new fiscal sociology” has placed taxation at the centre of social change, by considering taxation not only a symptom but also an engine of change (Martin, Mehrotra et al. 2009). As engine of change, the fiscal institutions are the key to the whole of state institutions, since it is tax revenue that determines the size of central administration, defence forces and public services. Redistributionist taxation is the principal tool of the modern welfare state to fund public works (such as roads and railways) and social services (such as education, health provision and social security), that foster both economic and social development. Progressive income and wealth taxes are at the core of fiscal fairness that enables the state to reduce the gap between the poor and the rich.

In colonial Africa, taxation did not promote redistribution in this sense. Jamal showed how both direct and indirect taxation (on basic and luxury goods) imposed by the British authorities on African and non-African farmers and wage earners increased income inequality in Uganda (1978). In parallel, forced labour in public works was used as implied tax in many

colonies. Waijenburg (2015) has shown the extent to which coercive labour saved expenditure for the French rule in West Africa.

On the expenditure side, investments in public services took off later in the colonies than in Europe and did not address the needs of the lower social classes, which were identified with the indigenous black population. The latter often did not have access to the public services that they actually funded, by paying personal or hut taxes to the state. The racial differentiation in social welfare in South Africa and the compensatory discrimination policies is a paradigmatic case that has been analysed by Midgley and Piachaud (2011). Recent studies have focused on the colonial legacy of initial investments in transportation (Jedwab and Moradi 2016) and their impact on post-colonial growth. Other scholars have pointed at the unequal distribution of the benefits drawn from the expansion of infrastructure during the colonial era. For instance, Fourie and Herranz-Loncan (2016) indicated how the development of railways in Cape Colony served exclusively the mine-based economy, while areas populated by blacks remained marginalized.

Portugal was a “jackal of imperialism” (Clarence-Smith 1987); in other words, the sovereignty of her dominions depended on the interests of key imperial powers. In this framework, transportation in Portuguese Africa might have developed to a certain extent to serve the trade and military interests of Great Britain.

Hypothesis and data

This paper shows the distributional effects of both native taxation and investments in infrastructure in the case of Portuguese Mozambique. Annual time series of tax revenue and public expenditure have been constructed, showing transformations in the main revenue sources and spending patterns over time. Moreover, data on population and railway traffic (freight and passengers) have been retrieved from Statistical Yearbooks of Mozambique.

The investments in the infrastructure of Portuguese Mozambique were made either by the colonial state or by foreign private companies and remained low during the early colonial era. I argue that although the public investments gradually took off (especially after the 1940s), they were insufficient to foster local development. The colonial state prioritized the construction of railways and roads to connect the mainland with the ports and support a series of activities: the trade with the metropole and British colonies, the internal and external labour migration and the movement of the military troops.

The example of colonial transportation demonstrates that the infrastructure investments served the interests of the domestic and foreign colonial rule (Portugal, Britain, South Africa, chartered and private companies, white settlers) and not the needs of the indigenous population. They contributed to regressive redistribution and widened the inequality gap both between racial groups and certain regions (rural-urban, north-south).

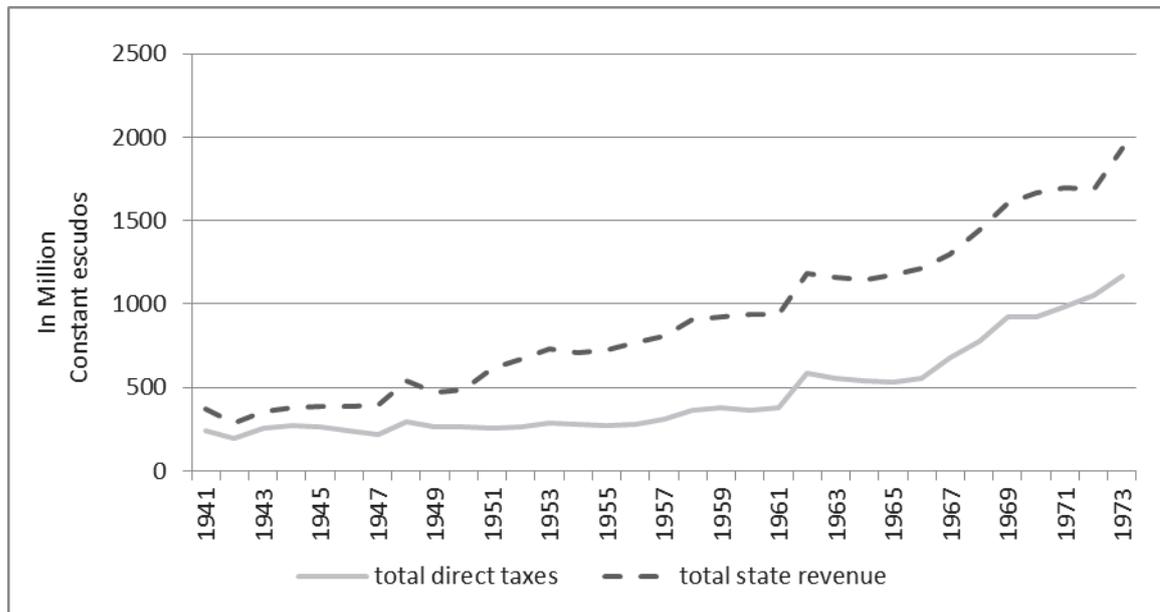
The indigenous tax and infrastructure investments in Portuguese Mozambique

Almost throughout the colonial era, the most important revenue source for Mozambique was direct taxation, including industrial, property and indigenous taxes. The levying of direct and especially indigenous taxes in Africa was not an easy task and thus, many colonial states relied on indirect taxes as much as possible.

The direct tax named as *dizimos* and later on the hut tax (*imposto de palhota*) were annual taxes imposed on indigenous households at fixed rates. In the early twentieth century the hut tax (rated at 2\$50) was strongly connected with the colonial regime of rural land ownership and “native reserves”: this tax was paid by Africans for squatting in the settlers’ farms in case they were not sent to native reserves, where the soil was mostly poor (Direito, 2013). Gradually, the hut/indigenous tax evolved into the most important revenue source for the colonial state of Mozambique. It was paid by the indigenous people, either per household or per capita (*taxa pessoal*), initially in kind and eventually in cash. The colonial authorities

imposed rates that sometimes varied from district to district. Nevertheless, they did not take into account income inequalities from household to household within a district.

Figure 1: Total revenue and revenue from direct taxation, Mozambique 1940s-1970s



Source: Statistical Yearbooks of Mozambique (*Anuarios Estatísticos*)

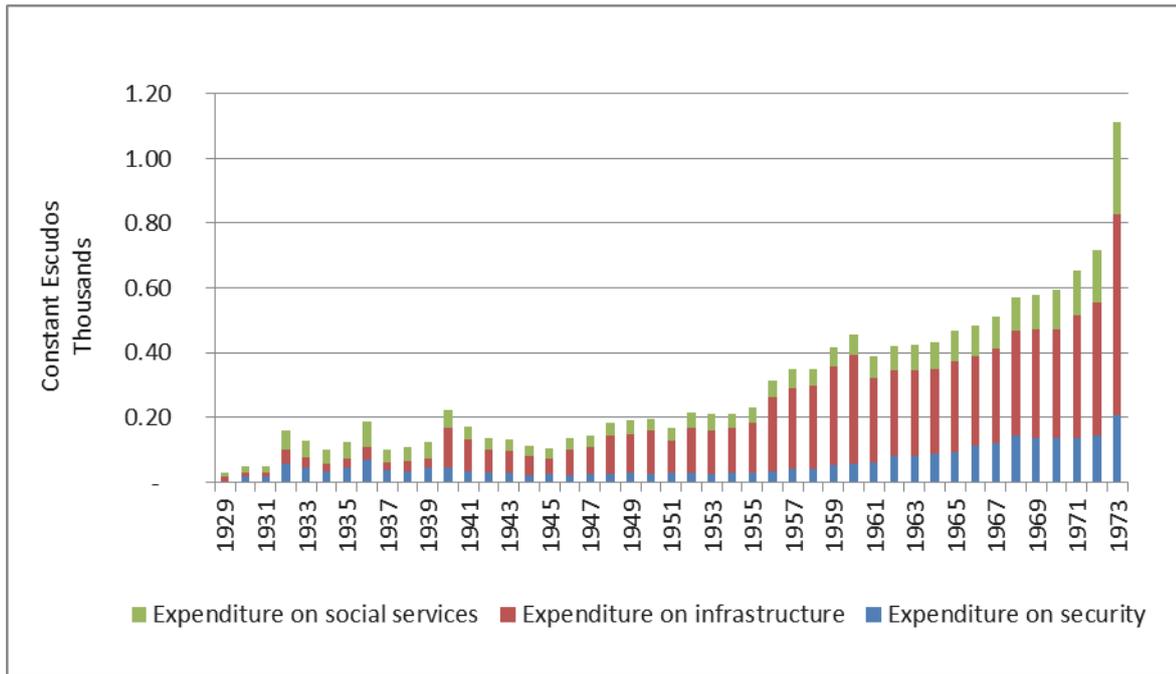
As Alexopoulou and Juif (2015) show, until 1961 the total direct tax revenue is composed of approximately 80 per cent indigenous taxes.⁵¹⁹ European settlers paid direct taxes according to their professional activities (registration taxes), but did not pay household or personal taxes, which was the principal source of direct tax revenue. Only after 1961, was the *indigenato* system (informal colour bar) ended and indigenous tax transformed into personal income tax. This is probably why we see a sudden rise in the total direct tax revenue (see figure 1). Also, the Portuguese rule institutionalized forced labour for public works and private enterprises, especially in less monetized regions where Africans failed to engage with wage labour and pay taxes.

How was revenue derived from indigenous taxes spent? In the early colonial era, investments in education and health were not even a distinct expenditure category in the Portuguese colonial accounts (unlike with the colonial records on British Africa). The early colonial budgets of Mozambique and Angola consisted principally of expenses on military and marine forces as well as on general administration. As figure 2 shows, in the period 1920s-1970s infrastructure development held an initially small but increasingly growing share over time. The implementation of Development Plans from the 1950s promoted infrastructure and social services, however the first plan aimed at increasing white settler migration and the second one took place under the threat of independence movements (Newitt, 1995, pp.461-64).

Colonial railways of Mozambique initially operated under the control of chartered companies, for which the lines were a valuable source of income, alongside the tax collection and agriculture profits. However, by the 1940s the companies' concessions ended and the railways came under the direction of the colonial state.

⁵¹⁹ To deflate, the CPI by Nuno Valério (2001, pp.661-662) is used.

Figure 2: Real public expenditure per capita, Mozambique 1920s-1970s



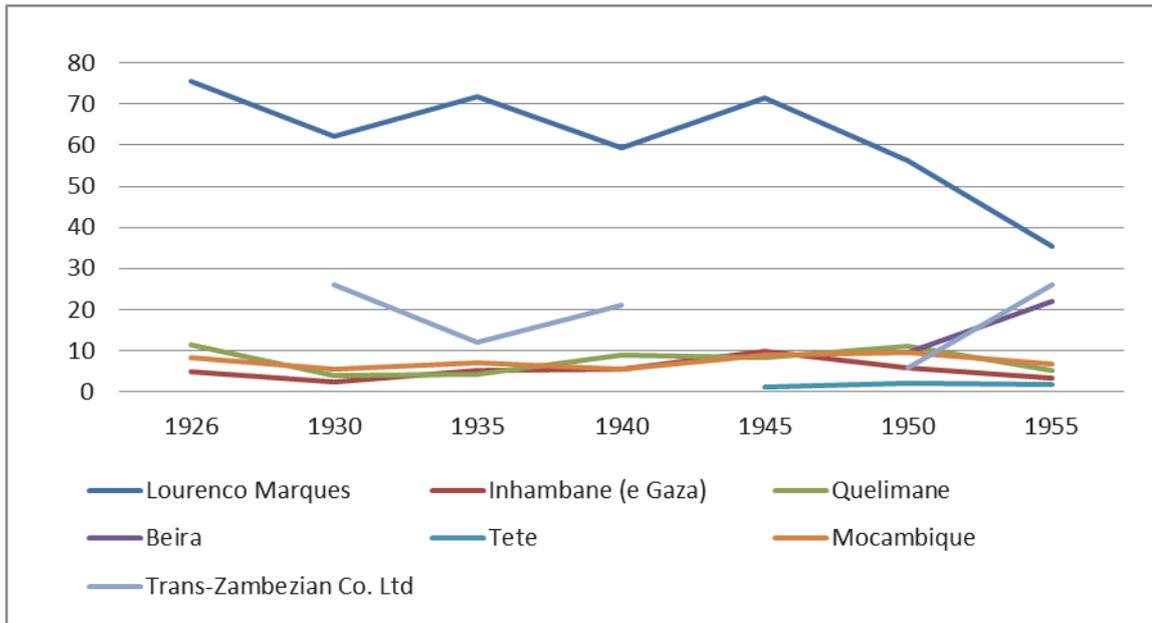
Source: Statistical yearbooks of Mozambique and Accounts of Mozambique

The first railway line was opened between Lourenço Marques and Ressano Garcia in 1890. In 1895 operations continued on the rest of the line, across the border to Pretoria. The so-called “Delagoa Bay Railway” was constructed by the Netherlands-South African Railway Company (NZASM). This led to the occupation of Gaza African Kingdom in southwestern Mozambique by the Portuguese army, to ensure the safety of the rail traffic. By 1900 the “Beira Railway” was also in service, after a contract signed by Portugal and Great Britain. This line linked the Mozambican port of Beira with the then Salisbury in Rhodesia (today Harare in Zimbabwe). From 1903, a 54 km long line was constructed from Lourenço Marques to Goba, on the border with Swaziland, so that the British colony could export its natural resources. Since the principal *raison d’ etre* of the railway network was to connect the mainland with the ports and facilitate the trade with the metropole and the British colonies, not all railway lines were connected to each other. For example, in the province of Zambézia, a 120 km long line was built from Quelimane on the Indian Ocean north to Mocuba, which had no connection with any other railway lines.

The first railway lines in southern Mozambique were built to enhance migration streams of workers from the southern zone to the gold and diamond mines in Transvaal. Several scholars have studied the institutionalized migration from Mozambique to the Rand mines and the economic importance of railway infrastructure for both Portugal and Union of South Africa (Pirie, 1993). By reading the bi-lateral agreement and the press of that period, commenting on the negotiations, one understands that the operation of the railway was not only a means to mobilize labour force from Mozambique to South Africa, but also an economic objective itself for both sides (Boletim Oficial, 1928, pp.336-37).

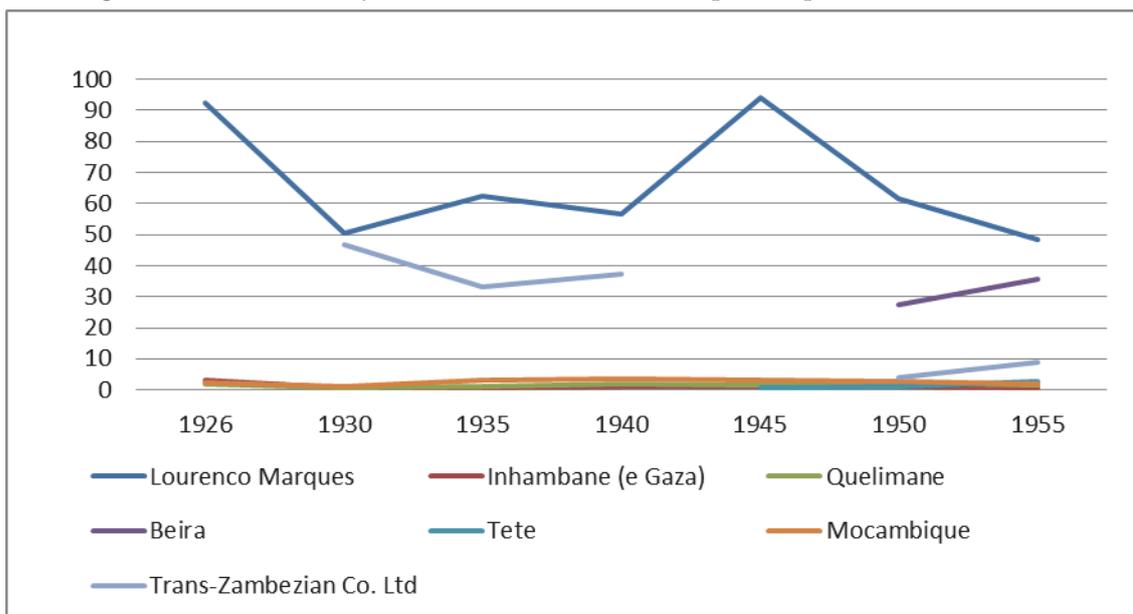
The opening of railway lines and roads also made easier the movement of the Portuguese armed forces during the Great War and World War II. Especially after the 1930s, army mobility increased due to the emergence of new means of transportation (cars and trucks) and communication systems (da Silveira, 1938, p.678).

Figure 3: Shares (%) of railway and road passengers per district, 1926-55



Source: Statistical yearbooks of Mozambique

Figure 4: Shares (%) of commodities in tons transported per district, 1926-55



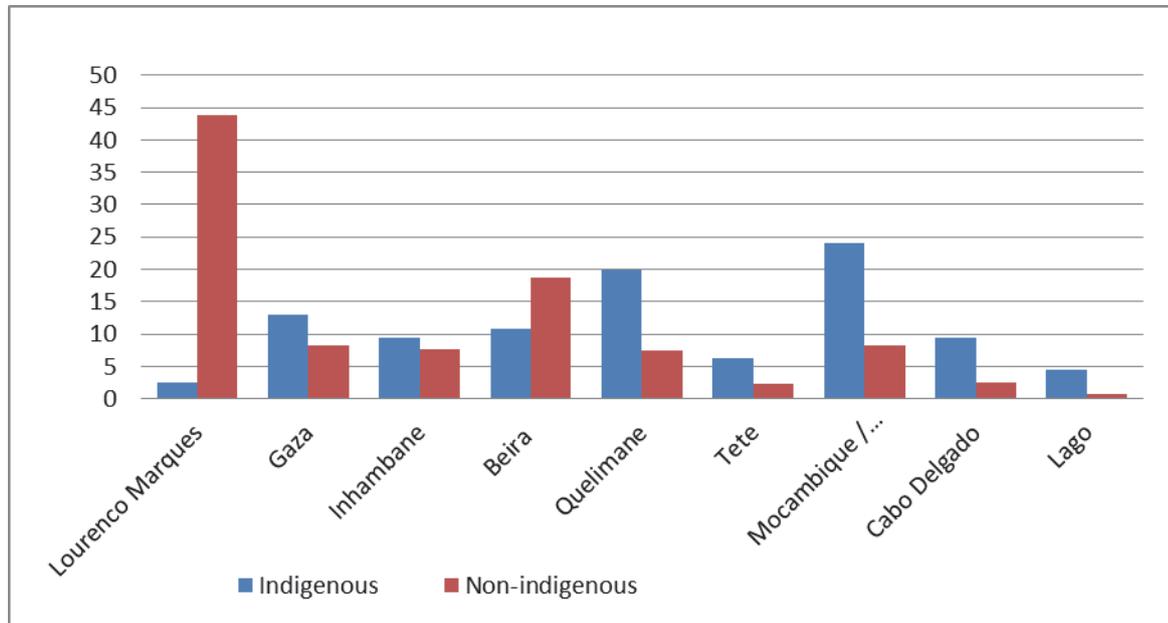
Source: Statistical yearbooks of Mozambique

As figures 3 and 4 display, Lourenço Marques had the busiest railway and road network concerning both passengers and car trucking (from 1945 onwards) as well as commodities transported. In the decade 1930-40 the private Trans-Zambezeian line also emerged in the colonial records and demonstrated noteworthy traffic. Last, the railway line and road crossing the Beira district becomes of crucial importance from the 1950s onwards. Thus, the main focus of colonial investments lay on the most urbanized districts and city-ports. On the contrary, insignificant traffic is observed in the rural districts of the centre and north: Inhambane, Tete, Quelimane and Mocambique.

This was due to the limited interest of the state to invest in the construction of railways and roads in these areas rather than due to other factors such as population density. The north, which was the most densely populated zone of Mozambique, was neglected. This might have contributed to its further impoverishment and isolation. Only in the 1960s did an efficient

road connect the north to the south. “Road building remained the responsibility of the local authorities and no network was created to link different regions of the colony until the last decade of colonial rule” (Newitt and Tornimbeni 2008, p.712).

Figure 5: *Relative shares (%) of indigenous and non-indigenous population per district, 1950*



Source: Statistical yearbooks of Mozambique

Consequently, indigenous people in Mozambique were not proportionally benefited by the boom of public investments in infrastructure in the second part of the colonial era. Figure 5 demonstrates that the rural districts of the central and northern zones were the ones inhabited by vast shares of indigenous people (out of the total indigenous population of Mozambique); while the vast majority of white settlers in the colony lived principally in the urbanized districts of Lourenço Marques and Beira, which were prioritized in terms of infrastructure development and characterized by high percentages of traffic.

Redistribution and growth for whom?

It is generally accepted that colonial societies were unequal societies. However, recent studies still emphasise the contribution of colonial investments to post-colonial growth or the tax burden on metropolitan citizens. In the case of Mozambique, the indigenous people contributed the most to state revenue by paying hut or personal taxes, while they were not benefited by the infrastructure development in the colony. The main preliminary conclusion of this paper is that even if infrastructure plays a considerable role in growth, this growth is of limited social value. The colonial investments in infrastructure targeted principally the city-ports, facilitating the trade of commodities, the labour migration, the movement of the military and the activities of white settlers. They did not benefit the rural north, populated almost exclusively by Africans. As a result, the colonial fiscal policies promoted regressive redistribution and deepened two interconnected forms of inequality: spatial and racial.

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The peseta during the Classic Gold Standard: fiscal, monetary and exchange rate policy

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The aim of this study is to analyse the rigidities of the gold standard using the Spanish case. One of the successes of the gold standard was to preserve stability across much of the world. The positive effects of stability and growth, however, were generally limited to advanced economies. Many of the countries on the periphery experienced major exchange rate fluctuations and instability.⁵²⁰

By looking at the case of the Spanish economy between 1874 and 1913, we can analyse the behaviour of macroeconomic variables in the only Western country that always remained outside the gold standard. This study sets out to analyse whether the instruments of monetary, exchange rate and fiscal policy had a real effect on the Spanish economy between 1874 and 1913. The paper explores the dynamic relationship between the macroeconomic variables and seeks to estimate the magnitude of their effects. To do this, an SVAR (structural vector autoregression) is constructed.⁵²¹

The paper is organized as follows: section 1 describes the methodology and the data; section 2 presents the empirical results; section 3 offers a discussion of the results in relation to the historical evidence and the previous literature; and, lastly, section 4 puts forward a conclusion.

I. Methodology and data

To analyse the dynamic relationship between macroeconomic variables, the following VAR model is constructed using variables for output (y_t), prices (p_t), fiscal balance (f_t), money stock (m_t) and exchange rate (e_t)

$$B(L)X_t = b_0 + \varepsilon_t \quad (1)$$

Where $X_t = (y_t, p_t, f_t, e_t, m_t)$, b_0 is the vector of the constant, $B(L) = B_0 - B_1L_1 - \dots - B_pL^p$ is a p -th order lag that forms a matrix $B_j = (j = 1, \dots, p)$ such that the diagonal elements of B_0 are equivalent to 1 and $\varepsilon_t = (\varepsilon_{yt}, \varepsilon_{pt}, \varepsilon_{ft}, \varepsilon_{et}, \varepsilon_{mt})$ is a five-by-one vector of serially uncorrelated structural disturbances with a mean zero and a covariance matrix Σ_ε .⁵²²

The structural model is as follows:

$$A(L)X_t = a_0 + u_t \quad (2)$$

Where a_0 is the vector of the constant, $A(L) = I - A_1L - \dots - A_pL^p$ is a p -th order lag of a matrix $A_j (j = 1, 2, \dots, p)$ and $u_t = (u_{yt}, u_{pt}, u_{ft}, u_{et}, u_{mt})$ is a five-by-one vector of serially uncorrelated structural disturbances with a mean zero and a covariance matrix Σ_u . The paper uses the Cholesky decomposition to orthogonalize the reduced form innovations.

The variable y_t is real per capita GDP measured using GDP from Prados (2003) and population from Nicolau (2005), p_t is the price index from Maluquer (2013), f_t is the real budget balance obtained by Comín and Díaz (2005), e_t is the real effective exchange rate with prices from Maluquer (2013) for Spain and prices from Mitchell (2007) for the remaining

⁵²⁰ For more information on the core-periphery discussion, see Hallwood et al. (1996); Bordo and Flandreau (2003), 420; Mitchener and Weidenmier (2015), 54, and Morys (2013), 205.

⁵²¹ A formal explanation of SVAR can be found in Sims (1986).

⁵²² This is the same order used in Christiano et al. (1999) and Shibamoto and Shizume (2014). Changes in the order of variables do not qualitatively alter the regression results.

countries, exchange rates from Martín Aceña and Pons (2005) and trade structure from Prados de la Escosura (1982), 42, and m_2 is the money stock measured through M1 (Martín Aceña and Pons, 2005). All the data have been calculated in real terms using the price index from Maluquer (2013).⁵²³

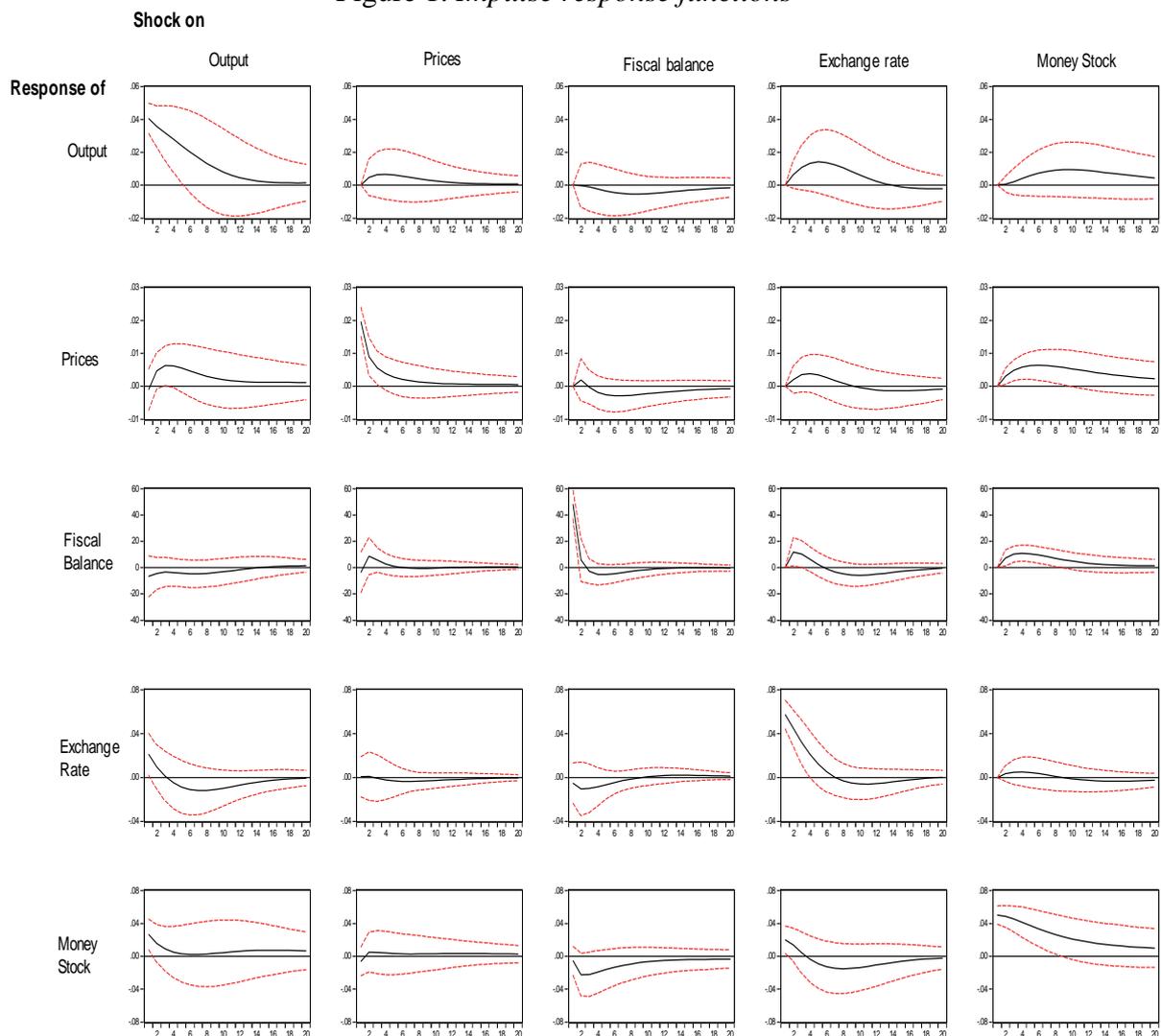
The frequency of the data is annual (1874-1913). All variables have been converted into logarithms.⁵²⁴ The optimal number of lags is one. The SVAR is estimated on levels because the performance of the estimation is consistent even if each variable is not stationary (Hamilton, 1994, 651-653).⁵²⁵

II. Empirical results

Impulse response function

The impulse response function traces the effect of a one standard deviation shock to the current and future values of the endogenous variables causing increases or decreases in the variables themselves.

Figure 1: Impulse response functions



⁵²³ On the one hand, Maluquer’s price index is chosen because its construction makes it more suitable for the analysis of a relatively short period of time. On the other hand, the results do not vary qualitatively if we use the M2 money stock, the nominal exchange rate or total GDP or per capita industrial output.

⁵²⁴ Because the budget balance has negative values, it cannot be converted into logarithms. As a result, the variable is used without conversion.

⁵²⁵ A Johansen test has been used to check for the existence of a cointegration vector.

Figure 1 sets out the impulse response functions of each variable. The rows show each variable's response to five different shocks. The columns show the response of all the variables to one type of shock. The dotted bands show a standard deviation of 1.96 with a confidence interval of 90 per cent.

According to the impulse response functions, an expansive fiscal policy had a positive impact on GDP. Both monetary and exchange rate policy also had a positive impact on GDP. With an increase in M1 or in the exchange rate (depreciation), GDP went up. Therefore, expansionary monetary and fiscal policy and the depreciation of the peseta were good macroeconomic policy instruments for the Spanish economy during the classic gold standard.

In the fourth column, it can be observed that shocks in the exchange rate have a positive impact on the exchange rate itself. Prices also respond positively to the exchange rate shock. GDP increased after an impact in the exchange rate. Exchange rate shocks had strong influences on the real economy, affecting both per capita GDP and prices. A rise in the exchange rate was followed by an increase in the money stock. With depreciation, the state's accounts improved. The exchange rate behaved endogenously as a function of the fiscal needs of the state.

The fifth column shows how an upward adjustment of the money supply by the monetary authorities lowered the value of the peseta and raised real per capita GDP and prices. Therefore, an expansionary monetary policy had effects on the real economy through the stimulation of aggregate demand.

If the symmetry of the functions is taken into account, a negative shock on the budget balance caused a rise in GDP and in prices. The application of an expansionary fiscal policy had a positive impact on Spain's real economy. Also, an increase in the deficits caused an increase in the money supply, providing evidence of the relationship between the two policies.

Shocks to GDP had significant effects on real GDP, but limited effects on prices. The money stock rose when GDP rose. Shocks to prices had a positive impact on GDP and on prices themselves. A shock to prices also caused a mild increase in the money stock. Maintaining freedom of action in monetary, fiscal and exchange rate policy had a positive impact.

Historical decomposition of the variables

The historical decompositions measure the cumulative contribution of each structural shock on the evolution of each variable over time. The figures show the decompositions for the fluctuations in each variable that can be explained by the five structural shocks in the model.

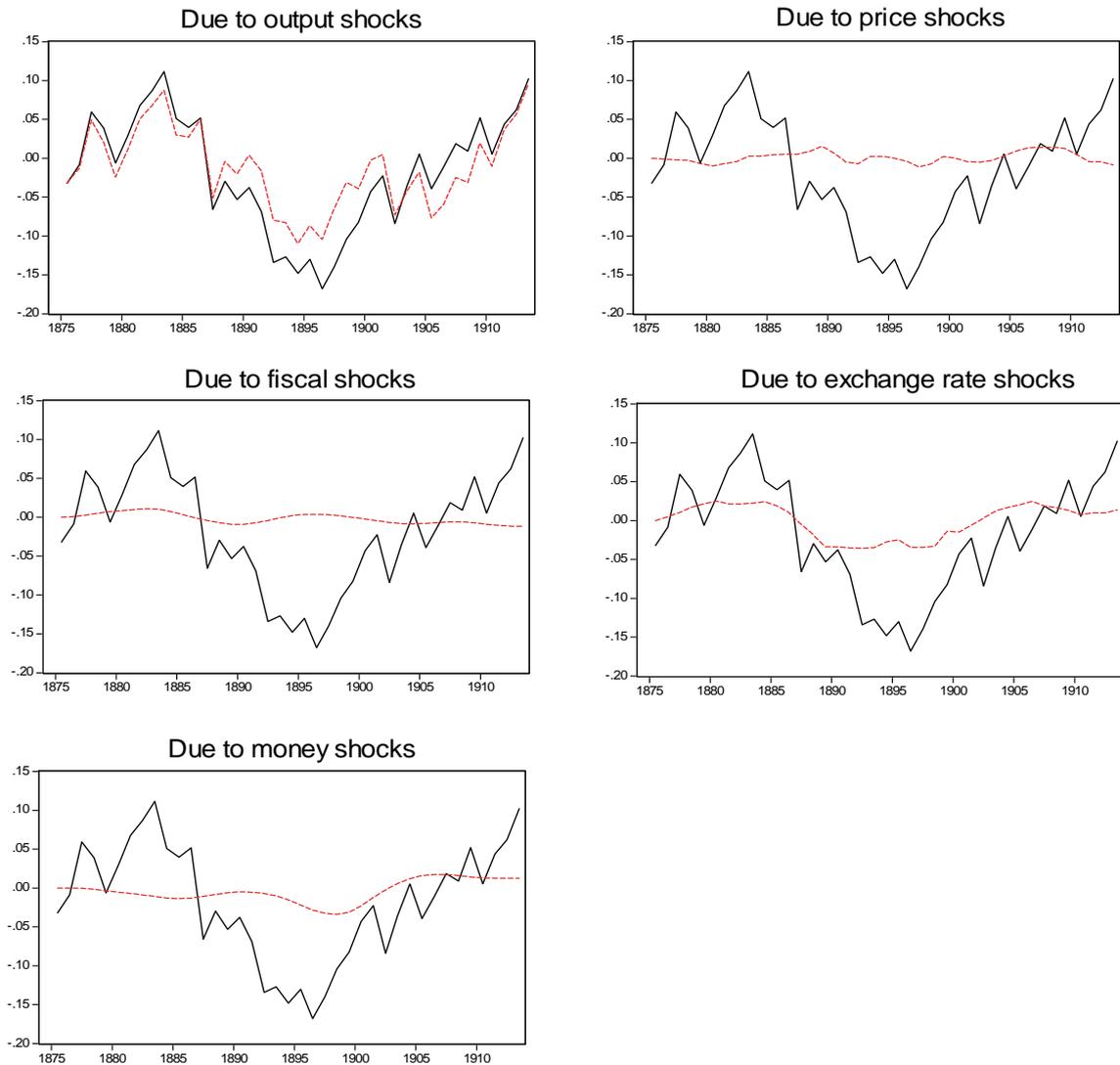
Figure 2: *Historical decomposition of GDP pc*

Figure 2 shows how the shocks of the different variables affected GDP fluctuations. The continuous line indicates the fluctuations in per capita GDP and the broken line shows how the different shocks contribute to explaining the GDP fluctuations. Shocks to per capita GDP account for most of the fluctuations in output between 1874 and 1884.

The exchange rate affected movements in per capita output, particularly in the positive trend in 1896-1906. From 1897 to 1899, it can be observed that the value of the currency stimulated the recovery of real per capita GDP. Therefore, the exchange rate acted in a countercyclical manner favouring the recovery of the Spanish economy.

Changes in the money stock further explain a significant portion (but less than exchange rate) of the falls and rises in per capita GDP, especially in 1896-1906. Specifically, the money stock helped to define the downward trend, but it also aided in the recovery of per capita GDP from 1897 to 1900. The impacts on prices only affected the downward trend of per capita GDP between 1892-96. The results indicate that the rise in the amount of money in circulation and the flexible exchange rate contributed to increased output (Catalan and Sánchez, 2012).

Figure 3: *Historical decomposition of fiscal balance*

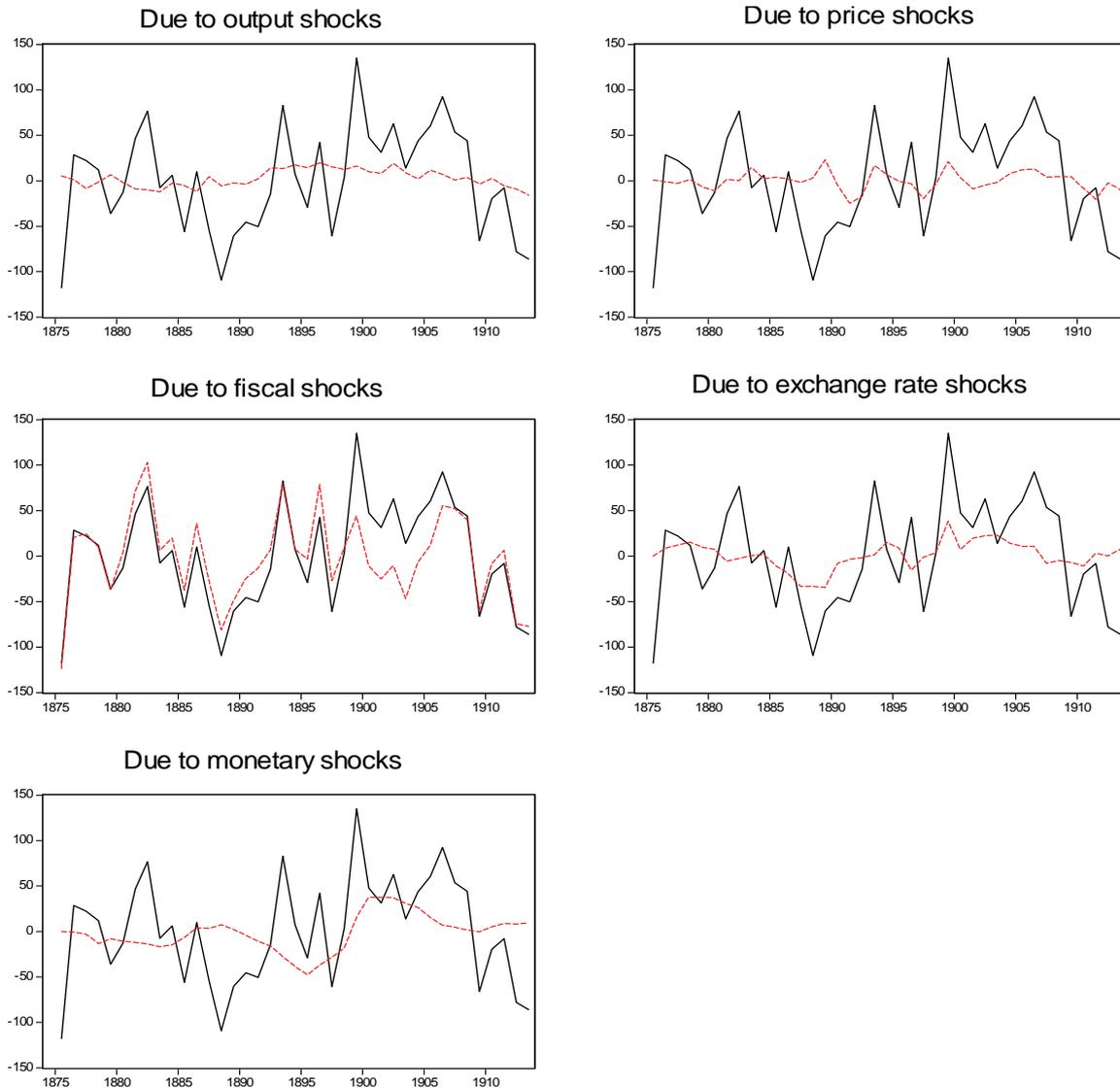


Figure 3 shows the historical decomposition of fluctuations in the fiscal balance. In the two periods 1885-92 and 1899-1906, the deviations can largely be explained by shocks in the exchange rate and in prices.

Figure 4 shows the historical decomposition of fluctuations in the exchange rate. Shocks in output are the ones that largely explain movements in the value of the currency. Shocks in per capita GDP were important in the periods 1875-81, 1884-93 and 1897-1905. These three periods saw three distinct declines in per capita GDP. Thus, the exchange rate responded to the state of the Spanish economy. Monetary policy, generally, had a low contribution.

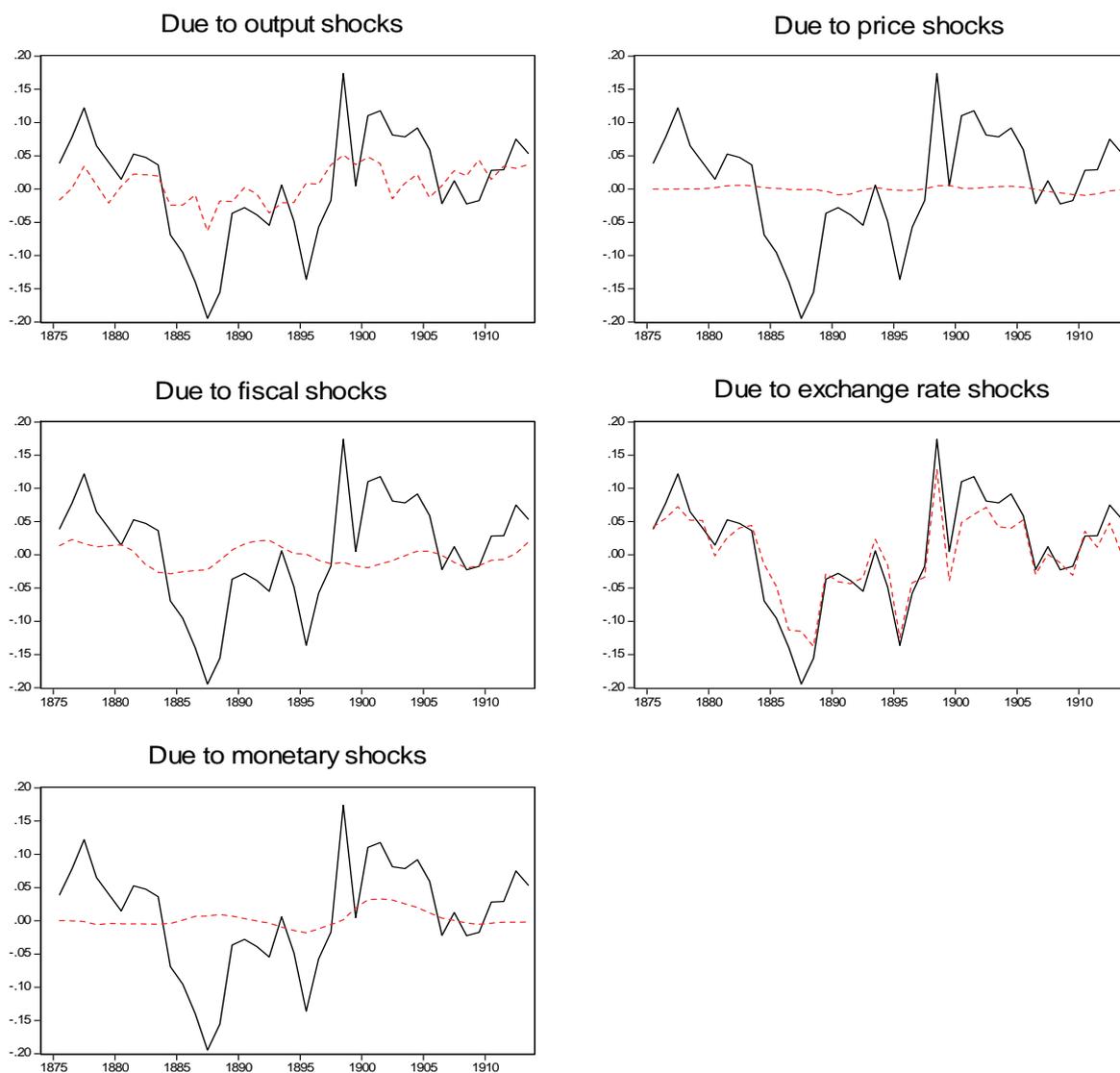
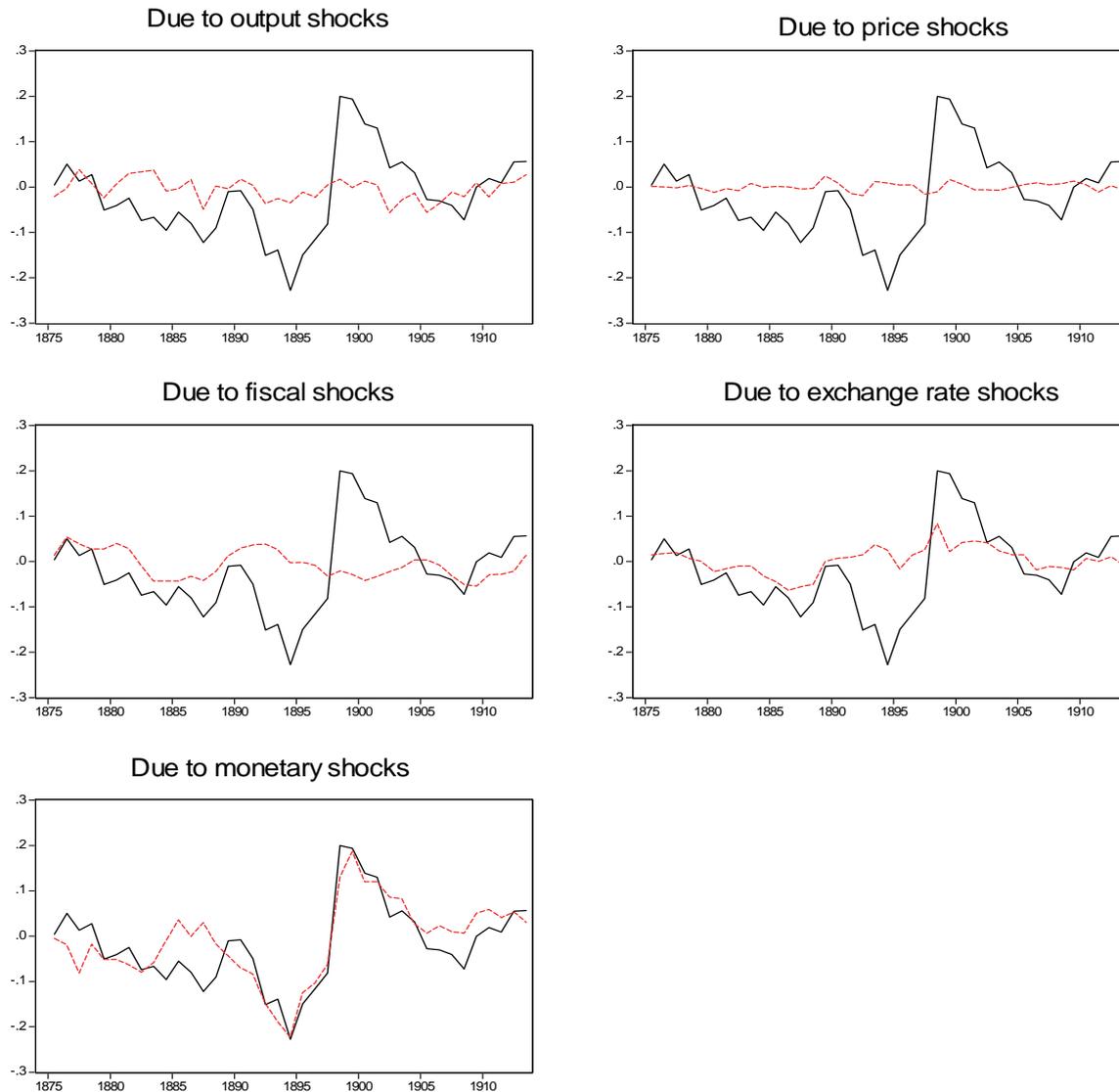
Figure 4: *Historical decomposition of exchange rate*

Figure 5 shows the historical decomposition of the money stock. The shocks to per capita GDP contributed to explaining the fluctuations in the money stock particularly in the period 1881-90. The period coincides with a fall in output. For this reason, we can affirm that monetary policy reflected a response to the economic cycle. No less important were the shocks to fiscal policy, specifically in the periods 1875-91 and 1902-6. The shocks in the exchange rate also played a part in 1895-1901, when the value of the currency experienced its sharpest drop.

Figure 5: *Historical decomposition of money stock*



The results demonstrate how the policies varied as a function of the economic conditions and the policies that were applied. Without these instruments, the adjustments would have been much more prolonged and painful.

III. Discussion

Policies in the late nineteenth century and early twentieth century were not devised strategically, but rather were adjusted in accordance with circumstances.⁵²⁶ None of these policy options would have been available under the gold standard and the impact of fluctuations in the economic cycle would have been much greater. Based on the results, the depreciation of the peseta was important to increase output and prices in the different crises experienced by the Spanish economy during the reference period.

Over the period, monetary policy played a fundamental role as a consequence of Spain being outside the gold standard. According to Sardà (1987, 218), the fiduciary expansion brought about by pressure from the Spanish treasury was able to sustain the country's economic progress. As the results demonstrate, this policy accommodated the fiscal needs of the State (Escario, Gadea and Sabaté, 2011, 271). In light of the findings, deficits helped to avoid further stifling of an economy that was already sluggish.

⁵²⁶ Olariaga, 1977, 137 takes the view that Spain's policy was ad hoc rather than a conscious effort to regulate the economic cycle.

Table 1: Growth rates of the components of real GNP during 1893-99

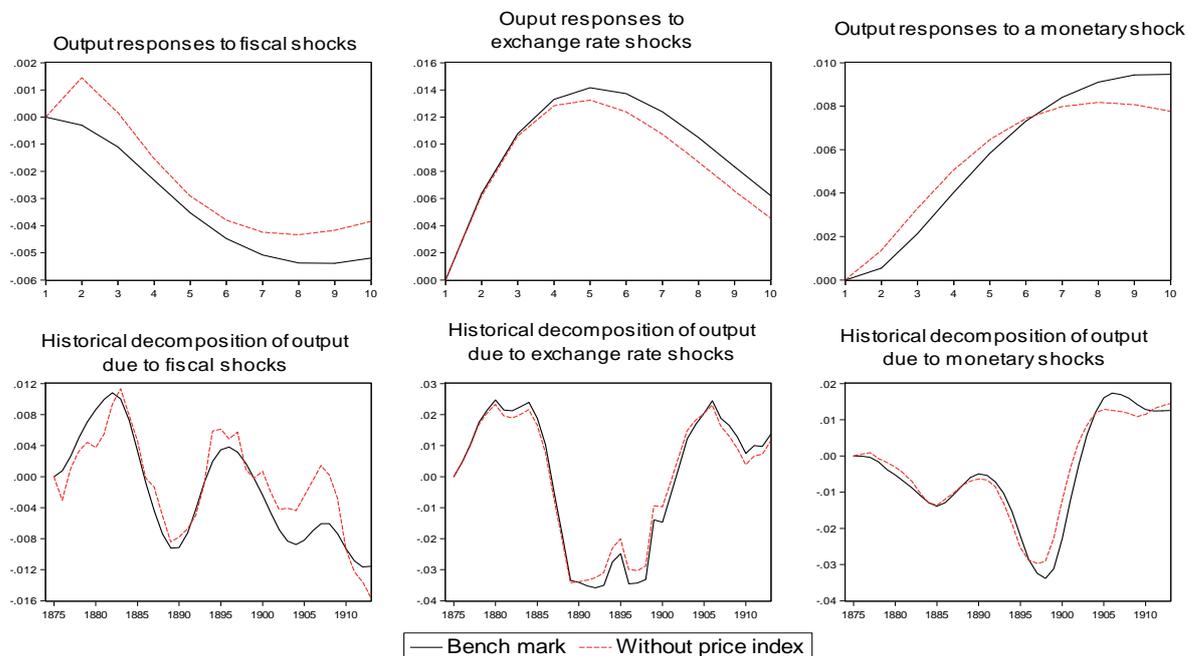
C	G	I	VE	X	M	GDP	YEAR
-9.07%	-0.88%	-0.62%	0.08%	-1.98%	1.04%	-11.437%	1893
-0.61%	-0.32%	-0.08%	0.11%	0.24%	-0.32%	-0.984%	1894
-4.69%	-0.15%	0.17%	0.12%	-0.48%	1.77%	-3.259%	1895
-5.09%	0.42%	0.00%	0.14%	4.34%	-1.93%	-2.131%	1896
10.85%	1.47%	0.68%	0.16%	2.23%	-1.61%	13.776%	1897
8.33%	0.79%	0.42%	0.10%	-0.17%	-0.02%	9.459%	1898
2.31%	-0.85%	2.93%	0.05%	-2.28%	-1.74%	0.409%	1899
11.25%	1.18%	5.15%	-26.68%	9.07%	-4.26%	-4.278%	1893-99

Source: Own elaboration based on Prados de la Escosura (2003).

In the specific case of the economic crisis of the late 1890s, the statistics on gross domestic product attach great importance to exports in the economic recovery at the end of the 1890s. Spain's economy fell by 4.28 per cent during the crisis that took place during this decade. Exports contributed to bolstering GDP by 9.1 per cent, while consumer spending pushed up GDP by 11.2 per cent. Investment, ranked third behind exports and consumption, contributed 5.15 per cent and government spending aided in a 1.2 per cent growth in GDP. In the short run, thanks to a flexible exchange rate, Spain was hardly affected by the cyclical downturn that affected the international economy between 1890 and 1896 (table 1).

The results obtained by Cha (2003) and by Shibamoto and Shizume (2014) vary depending on whether or not prices are included in the SVAR. For this reason, the same analysis has been repeated without prices to observe whether any changes occur. Without taking prices into account, the results do not vary qualitatively (figure 6).

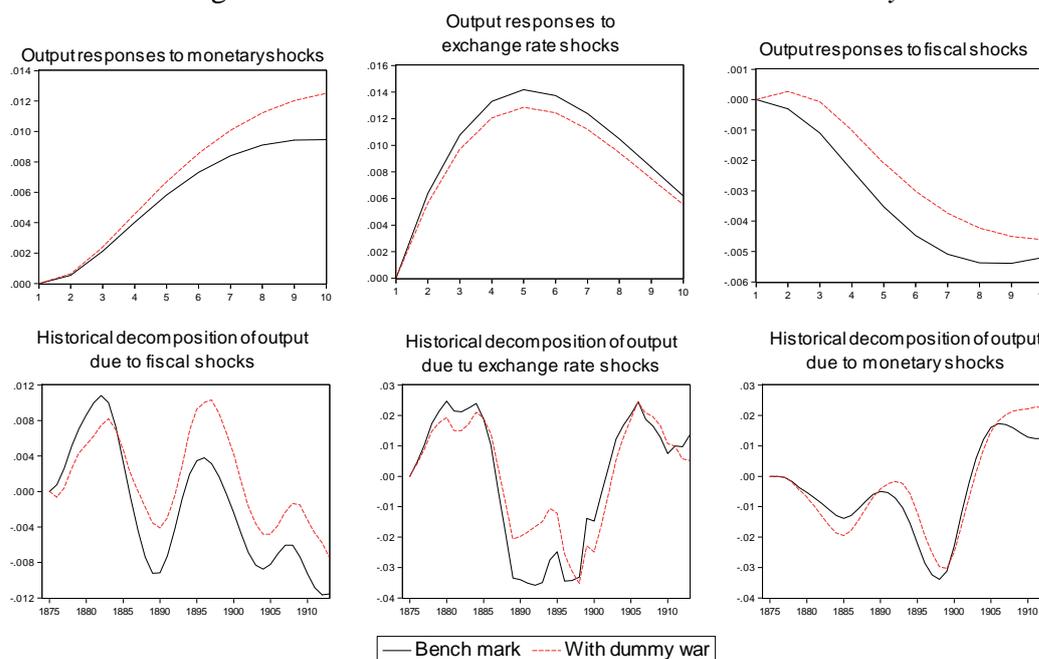
Figure 6: Benchmark model vs. VAR model without price index



As armed conflicts were prevalent in the period, the same model has also been estimated with the addition of an exogenous dummy variable that takes a value of 1 for years in which Spain was engaged in armed conflict and 0 for years in which it was not.⁵²⁷ The results do not vary qualitatively (figure 7).

⁵²⁷ Third Carlist War (1872-76), Ten Years' War (1868-1878), Little War (Cuba) (1879-80), Margallo War (1893-94), Cuban War of Independence (1895-1898), Spanish-American War (1898), Philippine

Figure 7: Benchmark model vs. VAR model with dummy war



IV. Conclusion

The SVAR analysis reveals that adjustments in exchange rates and monetary and fiscal policy undertaken as a policy tool played an important role in the recoveries that followed declines in GDP in the period 1874-1913. SVAR confirms that the policies were endogenous. In the face of dramatic economic shocks, the rigidities of the monetary system inhibited recovery, particularly in countries on the periphery. The level of the exchange rate was key since it helped to improve the terms of trade, promoted exports and raised prices at a time when the West suffered from the problems of deflation. The results in this paper provide new empirical evidence for the core-periphery debate addressing the period of the classic gold standard.

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Betting on Adenauer? The resumption of foreign direct investment into Western Germany after the Second World War

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The period between the end of the Second World War and the rise of Eurodollar markets during the late 1950s and early 1960s⁵²⁸ is rarely studied in the history of international capital markets. The absence of any quantitatively important cross-border capital flows at the time reflected a monetary system which favoured current-account liberalization at the expense of a closed capital account.⁵²⁹ The foreign direct investment (FDI) that nevertheless took place has been described in the broad historical FDI literature, for example by Wilkins (1974) or Jones (2005). Specifically for the case of Germany Wubs (2012), Kleinschmidt (1998), or Bader-Gassner (2014) offer a business history perspective on the operation of individual, large multinational enterprises (MNEs) in postwar Germany. However, with the exception of Eck (2003) for the case of French companies, there is as yet no comprehensive account of the first wave of FDI entering Germany after the War.

To have such an account is worthwhile for three reasons: First, FDI into Germany had been possible since early 1951 despite the capital controls in place, and it materialized within the limits set by the regulatory environment. Second, the early Federal Republic represents an interesting case for studying the determinants of inward FDI. It was a host country that had been cut off from international capital markets since the early 1930s and had achieved a disastrous international reputation in the meantime. However, from the late 1940s onwards its economy grew rapidly and re-integrated quickly with the rest of the world.⁵³⁰ Finally, inference about total FDI based on a limited number of large MNEs is problematic. The FDI strategy of a large multinational active in many countries can differ substantially from that of a small firm which only exports to one market. MNEs are also better able to internalize the absence of international capital markets.⁵³¹ Moreover, by their economic size they may be able to influence their own regulatory regime, an option not available to smaller firms. In fact, Wubs (2008) and Ruch et al. (2001) show that capital controls were negotiable to a large extent for foreign companies deemed strategic by the National Socialist regime during the 1930s and 1940s.

This paper takes advantage of a new dataset retrieved from the German Federal Archives. It contains the population of new FDI projects within Germany between the third quarter of 1950 and the first quarter of 1955 on the level of the individual firms involved. These data trace the resumption of FDI into Germany for almost five years following the abolition of the Allied moratorium on new foreign investment in August 1950.⁵³² In its present version the paper shows that investors who had already been active in Germany

⁵²⁸ Schenk (1998) provides a concise overview of the early development of the Eurodollar market, with a focus on London.

⁵²⁹ Harold James and Barry Eichengreen discuss the trade-off between current account and capital account liberalization in Eichengreen (1995).

⁵³⁰ Vonyó (2008) provides a recent overview of the already sizeable literature on the postwar recovery of European economies.

⁵³¹ Transfer pricing, royalty payments or reinvesting accrued profits were common strategies to cope with capital controls already during the 1930s, as shown by Ruch et al. (2001) for the case of Swiss multinationals. High profits during the War and insufficient transferability led to increasing investment by means of accrued profits.

⁵³² Buchheim (1990) gives a comprehensive account of the external economic relations of the Western occupation zones during the very early period between May 1945 and August 1950.

before the War dominated also after the War, with respect both to size and frequency of investment. Although there was a steady inflow of first-time FDI the latter did not stand out quantitatively. In other words, there was strong persistence over time in investment behaviour towards Germany and a large wave of first-time investors ‘betting on Adenauer’ did not materialize. These results apply to the few largest investors as well as to the large majority of small investors.

The historical context

On 6 March 1951 Allied occupation authorities legalized the trade outside Germany of blocked German currency accounts held with private German banks by foreign companies or individuals. These accounts were commonly referred to as *Sperrmark* and were materially equivalent to *Libka-Mark* that substituted the former in September 1954.⁵³³ *Sperrmark* were first introduced in the wake of the financial crisis of 1931 and were designed to stop capital flight from Germany. While the National Socialist regime immensely complicated the exchange control system for special aims,⁵³⁴ Allied authorities after 1945 retained a simplified version. These bank accounts were blocked in the sense that their balance could not be converted into other currencies and their use inside Germany was limited. Interest, profit or dividend payments due to foreign investors were payable onto these accounts.⁵³⁵ If the foreign owner nevertheless wished to transfer the balance to her home country she could do so indirectly by selling the account to another foreigner, albeit at a sizeable market discount that only started to disappear by the end of 1953. The other foreigner could then use the balance to invest in Germany. While small-scale portfolio investment into stocks and bonds was essentially liberalized, FDI projects required an individual permit by a special German government body, the ‘inter-ministerial investment commission’. This regulatory regime was kept in place until June 1955 when FDI was liberalized as well. The commission covered all submissions filed until March of that year, given the standard processing delay. Although the conversion of investment returns and capital amounts at current-account exchange rates had been gradually liberalized since early 1954 the *Sperrmark* system as such was retained until mid-1958 as the principal vehicle for foreign investment in Germany. Through *Sperrmark* additional FDI on the level of individual investors became possible despite the absence of macro-economic capital inflows.

The investment commission data

The investment commission processed around 6,700 projects in 122 meetings between September 1950 and June 1955. Of all the projects 3,138 were loans granted to German companies and 3,512 were equity capital investments. As the authorization procedure for loans was decentralized in early 1954 the period of observation for equity capital investments is five quarters longer than for loans. The data raise two problems: First, the data contain the population of FDI projects, and this population may differ from the population of actually realized FDI following authorization. Unfortunately there is no way to systematically control for the implementation of every authorized project. However, there is no evidence for waves of speculative submissions in the data. The submission procedure was costly in time and paper work. Moreover, the licensing regime was decidedly liberal, thus minimizing the risk of an unobserved regulatory bias. Instructions coming from Allied authorities largely stifled attempts to introduce decision criteria relating to sectoral protectionism or reciprocity for

⁵³³ For a detailed, contemporary discussion of the *Sperrmark* system cf. Dernburg (1955).

⁵³⁴ Among other things *Sperrmark* were used for export promotion purposes, as described in detail by Ebi (2004). This was no longer the case after the War. Only after April 1954 could *Sperrmark* under certain circumstances be used for imports from Germany, cf. Kühne (1984).

⁵³⁵ During the 1930s and for neutral countries even until 1945 certain, variable proportions of company profits could still be transferred abroad, cf. Frech (2001). This practice was discontinued after 1945 under Allied regulations.

German outward FDI. The second problem concerns the definition of FDI employed in this paper. On the one hand, the capital controls in place amounted to an exchange control regime, not a full-blown monitoring of foreign-owned capital in the German economy. The data therefore contain all FDI directly involving a foreign investor. Any indirect involvement is not observable, e.g. investment by foreign-owned subsidiaries, which increased the amount of capital in Germany effectively under control of the foreign parent. On the other hand, foreignness was determined by place of residence, not by nationality. This last point introduces a number of complications that cannot be discussed in this paper for lack of space, although they can be controlled for econometrically.

Figure 1 reveals the prevalence of relatively small investment projects. Seventy-five per cent of all projects involved an investment of 50,000 DM or less, while 75 per cent of all German companies targeted by FDI had a nominal capital of 100,000 DM or less at the time of investment. During the same period the average nominal capital of German limited companies was more than twice as high.

Figure 1: *Equity invested and extant nominal capital of German investment target, 1950-55*

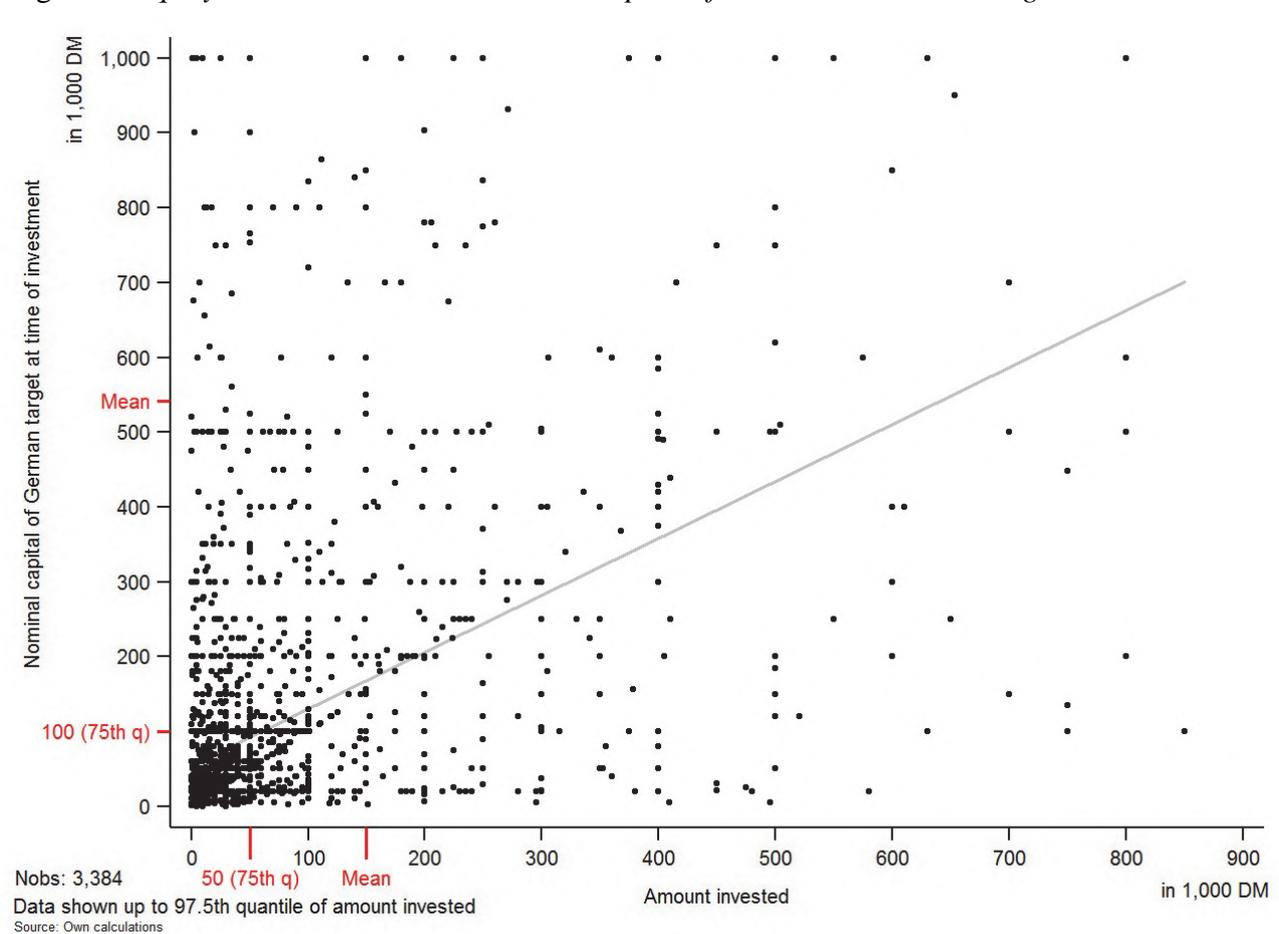
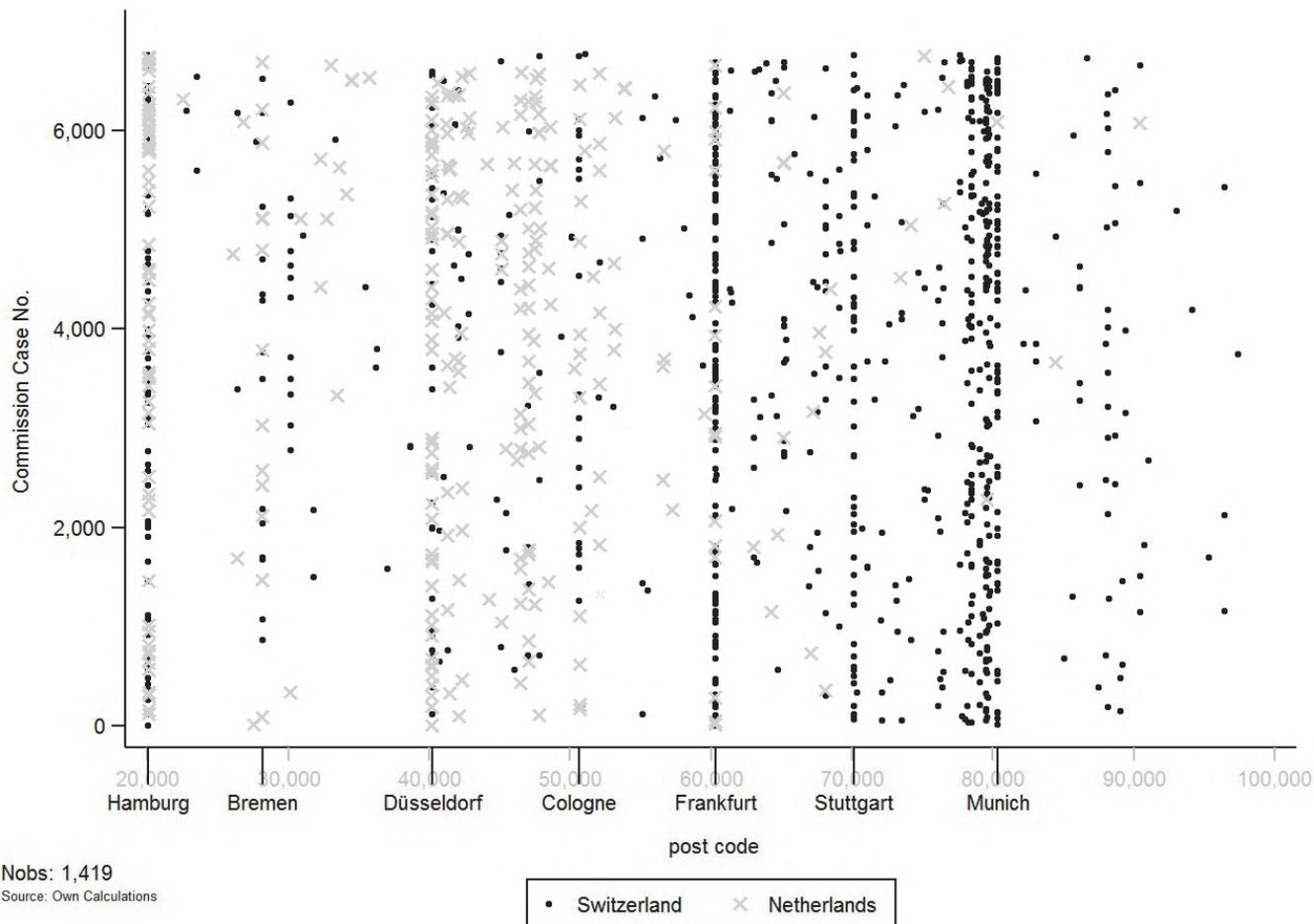


Figure 2: *Distribution of equity investments across German post code areas, 1950-55, for the case of Swiss and Dutch investors*⁵³⁶



The average numbers are also higher in figure 1. The high means relative to the median of both amounts invested and nominal capital are due to very few, and at the same time very large individual cases. Investors who spent more than the 97.5th quantile accounted for 41 per cent of total amounts invested, while those who spent more than the 75th quantile still accounted for three-quarters of total amounts invested. The data look very similar with respect to loans rather than equity investment. A first major observation therefore is the fact that concentrating on the largest investors does indeed capture a sizeable proportion of FDI into Germany. However, it omits the very large majority of investment projects that together account for an important share of total FDI. Figure 2 gives the simple unweighted distribution of equity investment projects across German five-digit post code areas, for the specific case of investors from the Netherlands and Switzerland. It looks similar for loans or when including other home countries. The ordinate may serve roughly as a time axis, showing the serial number of individual projects as processed by the Investment Commission. There are three main takeaways: First, while projects were geographically concentrated in large economic centres, 70 per cent of all German districts had at least one FDI project. Second, there was a clear proximity effect with respect to investors from Continental European countries. Dutch investors clustered in the region closest to the Netherlands (40,000-50,000) while Swiss investments were most frequently located close to the Swiss border (77,000-80,000). The same effect can be observed for French, Belgian or Austrian investors. The pattern was broken by the city of Hamburg, which was always an important FDI destination. Finally,

⁵³⁶ In this paper cities with more than one post code are coded with the code that corresponds to the Central Railway Station, in case a more exact firm location is not known.

there were no large, easily visible shifts over time in either the number of projects or their geographical distribution across Germany.⁵³⁷

Betting on Adenauer?

The landslide victory of the ruling centre-right coalition under Chancellor Konrad Adenauer in the second Federal elections of September 1953 was seen by many as a powerful endorsement of Western integration by the German electorate. It reflected the successful recovery of the German economy, which included a rapidly improving economic environment for foreign investment. Among other factors, the London Debt Agreement of February 1953 removed a long-standing liability on Germany's ability to introduce convertibility on the capital account, by putting in place a sustainable amortisation plan for the country's outstanding foreign indebtedness. To the same effect, the severe German deficit crisis within the European Payments Union during the winter of 1950/51 gave way to permanently large surpluses by the middle of the decade.⁵³⁸

A series of simple regressions shows that the improving investment environment did not translate immediately into a large-scale arrival of first-time investors. Models (1) to (3) in table 1 measure the determinants of whether an investment transaction with a particular German target company – once established – was repeated, and if it was, by how many times. The results show that foreign investors who had already had a controlling interest in the German target company before the War were among the most frequent investors after the War, too. Being such a prewar parent made repeated investing four times as likely as being any other investor. Moreover, repeated targets, i.e. German companies who had concluded an investment transaction with a third foreign investor since the War were six times as likely as other FDI targets to have frequent transactions with their present investor. The results are equivalent regarding the number of repeated transactions. Although German companies newly founded after the War by FDI were frequent targets, the amount of money they typically received was relatively small, as shown in models (4) through (6). There again, subsidiaries of foreign parents received disproportionately high sums. Foreign trustees, i.e. banks and other intermediaries, did invest individually large sums, but usually only once in any one German target. Excluding the largest investment projects in models (5) and (6) yields similar results. For these smaller companies, family relations abroad materialized in very little investment, while investment size tended to increase with the frequency of investment. Persistent capital controls in most home countries during the period could explain the observed pattern. Indeed the two countries without restrictive capital controls – Switzerland and the US – appeared either significantly more frequently or with significantly larger investments than other countries, even among small investors.

Finally, sectoral influences show the expected sign when restricting attention to industrial sectors of the German economy in models (2), (3), and (6).⁵³⁹ Sectors that grew more quickly than the average over the first half of the 1950s received significantly larger investments, and did so more frequently than sectors that grew more slowly. Moreover, highly competitive German export sectors were significantly less frequent targets of foreign investment.

⁵³⁷ Regarding the distribution of total equity FDI across investor home countries, the four largest account for 83% of the total. The US, the UK, and Switzerland each provide between 20% and 25%, followed by the Netherlands with 16%. The UK share is heavily driven by the Anglo-Iranian Oil Company (BP) which invested large sums into its Hamburg refinery. Swiss lenders, including various types of intermediaries, dominate the distribution of loans across home countries.

⁵³⁸ Cf. Guinnane (2016) on the London Debt Agreement and Kaplan and Schleiminger (1989) for a history of the EPU.

⁵³⁹ The restriction to industrial sectors is data-driven. Turnover data for sufficiently disaggregated sectors are only available for industries through the monthly *Industrieberichterstattung* provided in Statistisches Bundesamt (several years).

Table 1: *The determinants of investment frequency and investment size, 1950-55*

	(1)	(2)	(3)	(4)	(5)	(6)
	Logit (or)	Logit (or)	OLS	OLS	Tobit	Tobit
Dependent variable:	Repeated	Repeated	No. Repeated	ln(Investment size)	ln(Investment size)	ln(Investment size)
	All sectors	Industry only	Industry only	Equity FDI only	Equity FDI only (up to 97.5 quant)	Industry Equity FDI only (up to 97.5 quant)
parent	-----	-----	-----	0.811 (0.091)***	0.697 (0.083)***	0.659 (0.094)***
prewar parent	4.517 (0.586)***	4.598 (0.685)***	0.404 (0.049)***	-----	-----	-----
prewar target	0.998 (0.007)	0.998 (0.008)	-0.000 (0.000)**	-0.000 (0.000)	-0.000 (0.001)	-0.000 (0.001)
FDI founded target	2.053 (0.229)***	1.923 (0.253)***	0.158 (0.026)***	-0.229 (0.067)***	-0.219 (0.061)***	-0.205 (0.071)***
Repeated	-----	-----	-----	0.105 (0.086)	0.170 (0.081)**	0.214 (0.093)**
Repeated target	6.749 (0.800)***	6.555 (0.909)***	0.469 (0.048)***	0.010 (0.107)	-0.030 (0.091)	-0.154 (0.105)
family	0.930 (0.145)	1.027 (0.177)	-0.008 (0.025)	-0.287 (0.147)*	-0.271 (0.106)**	-0.350 (0.119)***
CH	1.531 (0.175)***	1.486 (0.196)***	0.061 (0.026)**	0.082 (0.061)	0.068 (0.062)	0.036 (0.070)
US	1.041 (0.146)	0.982 (0.161)	-0.014 (0.028)	0.279 (0.075)***	0.218 (0.075)***	0.167 (0.087)**
UK	0.934 (0.188)	0.880 (0.212)	0.014 (0.051)	-0.137 (0.105)	-0.140 (0.097)	-0.181 (0.116)
NL	1.022 (0.187)	1.038 (0.229)	-0.030 (0.033)	-0.121 (0.099)	-0.193 (0.084)**	-0.300 (0.100)***
foreign trustee	0.903 (0.141)	0.877 (0.161)	-0.089 (0.034)***	0.382 (0.117)***	0.328 (0.114)***	0.319 (0.135)**
quarter	0.837 (0.009)***	0.824 (0.011)***	-0.034 (0.002)***	-0.038 (0.005)***	-0.036 (0.005)***	-0.033 (0.006)***
ln(target nominal capital)	-----	-----	-----	0.534 (0.022)***	0.461 (0.017)***	0.437 (0.019)***
high growth sectors	-----	1.344 (0.222)*	0.052 (0.033)	-----	-----	0.202 (0.091)**
high foreign turnover	-----	0.678 (0.111)**	-0.079 (0.030)**	-----	-----	0.120 (0.090)
Large sectors controls	YES	YES	YES	YES	YES	YES
Constant	0.265 (0.037)***	0.335 (0.059)***	0.415 (0.037)***	4.503 (0.241)***	5.234 (0.207)***	5.360 (0.236)***
Observations	5,209	3,818	3,818	3,384	3,301	2,398
(Pseudo) R ²	0.175	0.189	0.150	0.344	0.085	0.085

Standard errors in parantheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Own estimates

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The effect of monetary and exchange rate institutions on the financial cycle, 1922-2015

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1. Introduction

We expand on the literature on financial crises by drawing evidence on a link between the institutional framework and the behaviour of the financial cycle, composed by the boom-bust cycle in asset prices and credit aggregates. Our research question is whether stock prices and net loans to the non-financial sector behave differently in levels and volatility under different monetary regimes, defined as agreements on monetary policy, exchange rates and capital flows. This draws on the work by Borio & White (2004) who indicate monetary regimes are characterized by their elasticity: the potential to accumulate excessive asset price and credit growth which, when they unwind, result in financial crises.

The boom-bust process in asset prices is relevant for policy makers because it increases financial instability and affects consumption and real economic activity (Bernanke & Gertler, 1999). Additionally, when asset booms are fuelled by excessive credit growth the unwinding of imbalances can have deep consequences through the financial accelerator mechanism (Bernanke, Gertler & Gilchrist, 1999). Thus, understanding what causes the changing amplitude and frequency of the financial cycle becomes critical for designing policies that may prevent harmful booms and mitigate busts.

The mechanisms through which monetary arrangements may impinge on the financial cycle arise from the macroeconomic trilemma (Mundell, 1963), where policy makers have to choose two out of three desirable goals: free monetary policy, stable exchange rates and free capital mobility. The period of study (1922–2015) offers examples of all pairwise combinations of these mechanisms.

- Gold standard: stable exchanges and free capital flows
- Bretton Woods: free monetary policy and stable exchange rates
- Managed float: free monetary policy and capital flows
- European Monetary Union: stable exchanges and free capital flows

This study will cover France, Germany, Italy, the Netherlands, Sweden and the United Kingdom because they have well-developed financial markets and partook in the different monetary regimes of the twentieth century.

From a methodological perspective, we construct four dependent variables, each with a different time horizon, which measure the cycles in credit and the stock market: the Boom Bust Indicators (BBIs). These time series are preferred above 0/1 sequences that indicate crises events for several reasons: they contain more variability; they indicate whether there is a boom or bust and provide a measure of their intensity, and they do not smooth the series nor perform statistical assumptions about the data. Through regression analysis and variance ratios tests we identify whether these indicators behave differently, in mean and volatility, under certain monetary regimes. Finally, we aggregate the evidence in a set of scatter plots to rank regimes according to their elasticity.

The most relevant result indicates there is a statistically significant role for the monetary regime both on the level and volatility of asset prices and credit. Second, we find that some sort of currency peg favours financial stability both in the short and long-run. Finally, a nominal anchor of the currency appears to be insufficient in generating financial stability as it appears to present large booms and heightened volatility both in stocks and credit.

2. The broader debate and policy implications

The contribution of this paper to the literature is shedding light on the relationship between monetary institutions and the financial cycle in order to include it in a broader debate on the role that the monetary policy reaction functions should give to asset prices, credit and their cycles. If the choice of a monetary regime has an effect on the accumulation and unwinding of imbalances then, necessarily it has implications for policymaking, crises prevention, and their resolution.

Currently, one side of the debate, the “Jackson Hole Consensus” proposes a view of benign neglect arguing that increases in asset prices should be taken into account if, and only if, they affect expected inflation and that it is impossible to determine whether a boom is tied or not to fundamentals making equivocal reactions in monetary policy costly in terms of output and inflation (Bernanke & Gertler, 1999).

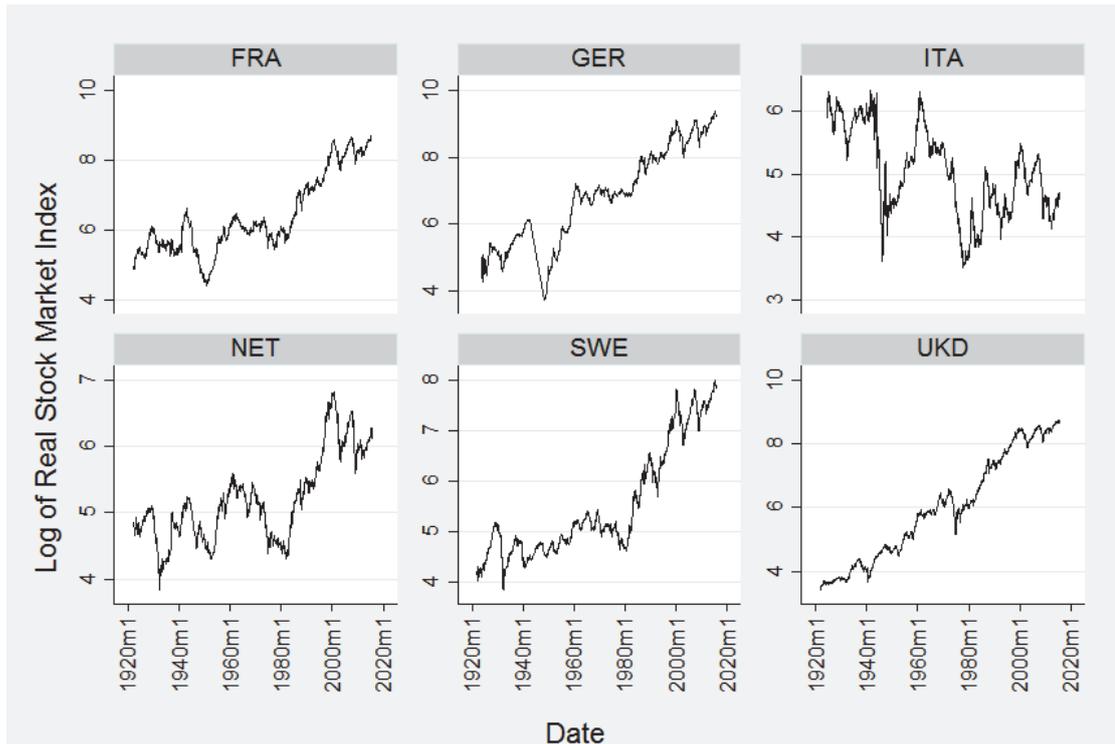
At the other side of the debate, the “Basel consensus” proposes policymakers should follow a leaning against the wind policy, monetary tightening in the face of imbalances, in order to prevent busts that may be followed by credit crunches, falls in output, and economy-wide crises (Bordo & Jeanne, 2002). Borio & Lowe (2002) find that under a fiat currency the only constraint for the expansion of credit is the policy rule of monetary authorities. Thus, there cannot be a real anchor to the value of currency unless the monetary rule responds to the buildup of financial imbalances.

In our case, if the boom-bust cycles in asset prices and credit are contingent on the monetary regime, then under regimes that are more elastic there should be both a leaning against the wind policy and regulation of the foreign sector. This argument would undermine the benign neglect claim and suggest that an optimal monetary order is not only one where prices are stable but where other conditions are present so as to avoid imbalances from accumulating.

3. Database

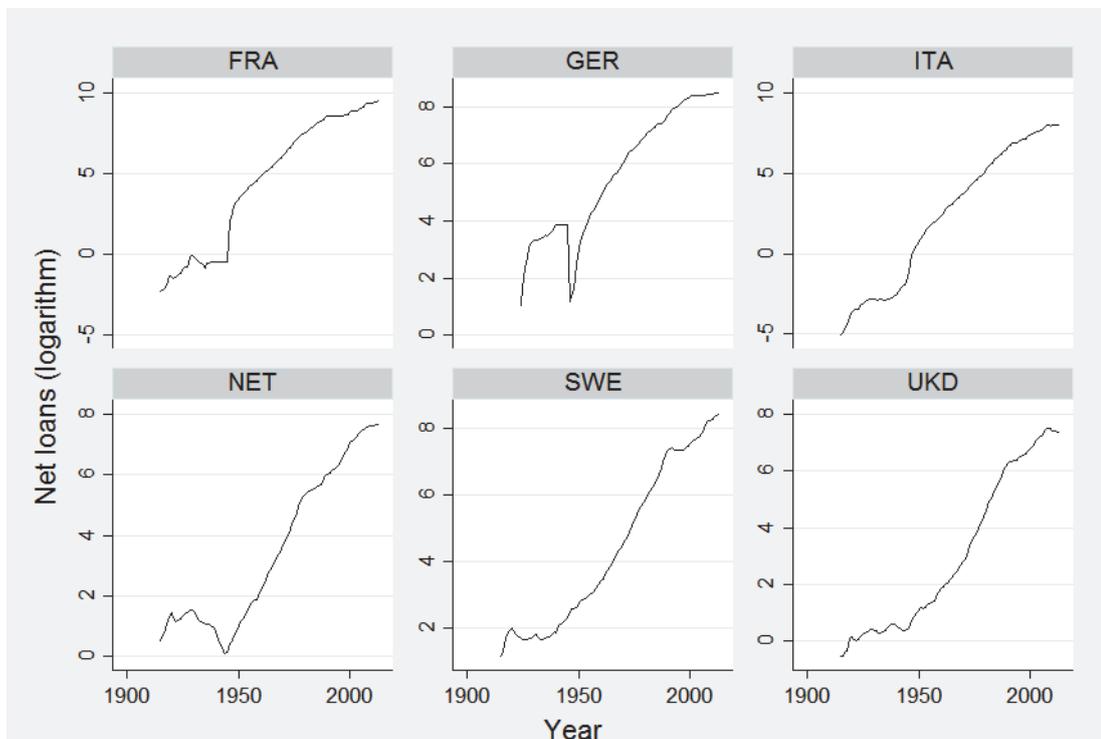
The database consists of stock market prices, levels of credit and regime dummy variables for the period ranging from 31 January 1922 to 30 September 2015. We obtained monthly market-wide value-weighted stock indices expressed in real terms for the six countries from the Global Financial Database.

Figure 1: *Evolution of the real stock market index in logarithms*



Data for credit corresponds to the yearly total net domestic loans to non-financial private sector in nominal terms and local currency, from 31 December 1915 until 31 December 2013 (Jordà, Schularick & Taylor, 2017).

Figure 2: *Evolution of net loans in logarithms*



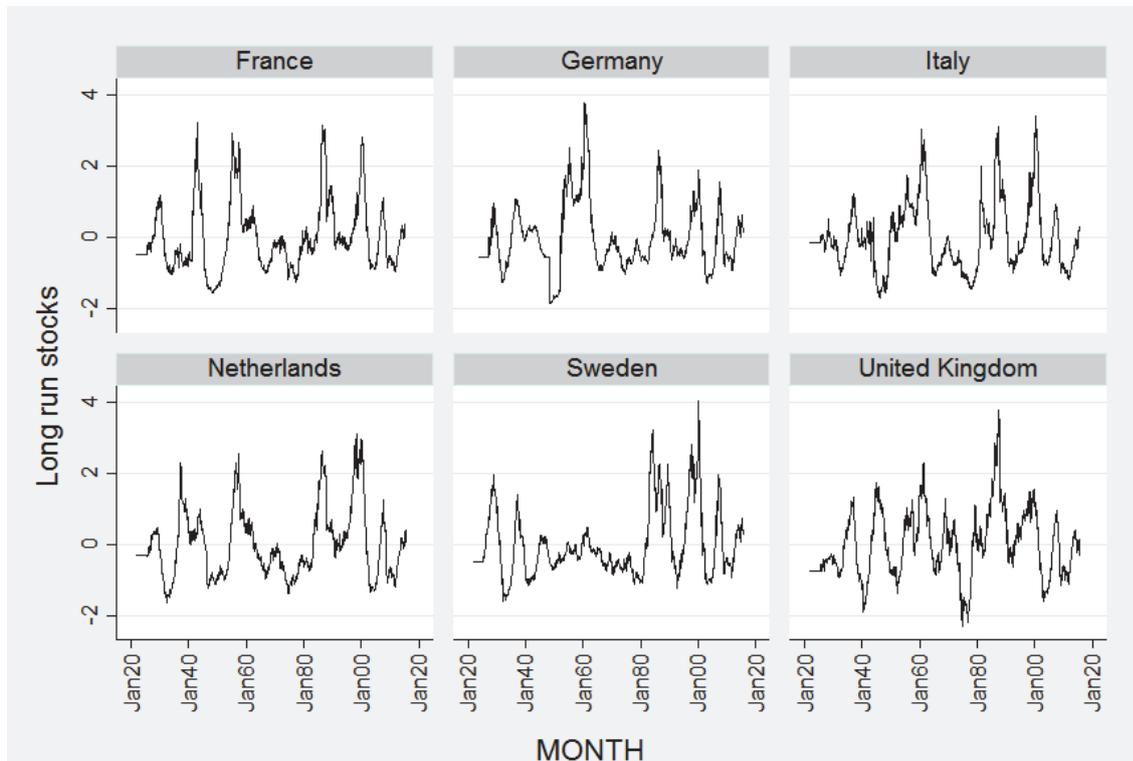
For the independent variables we constructed regime dummy sequences using the works of Bernanke & James (1991) and Ilzetzki, Reinhart & Rogoff (2008) who break monetary regimes in five:

- Lax gold standard: Both the *de facto* and the *de jure* gold standard excluding periods where convertibility was not supported.
- Strict peg: Hard peg, crawling peg, band around a currency (narrower and up to 6 per cent included) and crawling bands.
- Managed float: Bands broader than 6 per cent, managed floats, and deviations from the *de jure* peg that exceed 10 per cent.
- Strict free floating regime: taken directly from Ilzetzki, Reinhart & Rogoff (2008).
- EMU: Takes a value of 1 for countries in the euro.

4. The boom-bust indicator

We will build on Forero-Laverde (2016) and construct time series that mimic the evolution of stocks and credit based on the structure of their empirical distribution. The intuition behind the measure is that if aggregate returns for several time horizons move farther to the right (left) of the distribution the indicator, measured in standard deviations, takes larger positive (negative) values. To do so, we construct an n -period standardized growth rate matrix Z in which rows will represent time and column vectors z_n hold the z -scores for the growth rate from period $t-n$ until t . The variable n will only take successive integer values from 1 to 5 years for credit and from 1 to 12 months and then values every half-year from 18 to 60 months for stocks. We aggregate vectors z_n through linear combinations to obtain the Boom Bust Indicators (BBIs) for different time horizons: short-run (from 1 to 12 months), medium-run (from 13 to 36 months), long-run (from 37 up to 60 months), and a total sample which includes all vectors. Vector weights are obtained from factor loadings resulting from a factor analysis (Tsay, 2002).

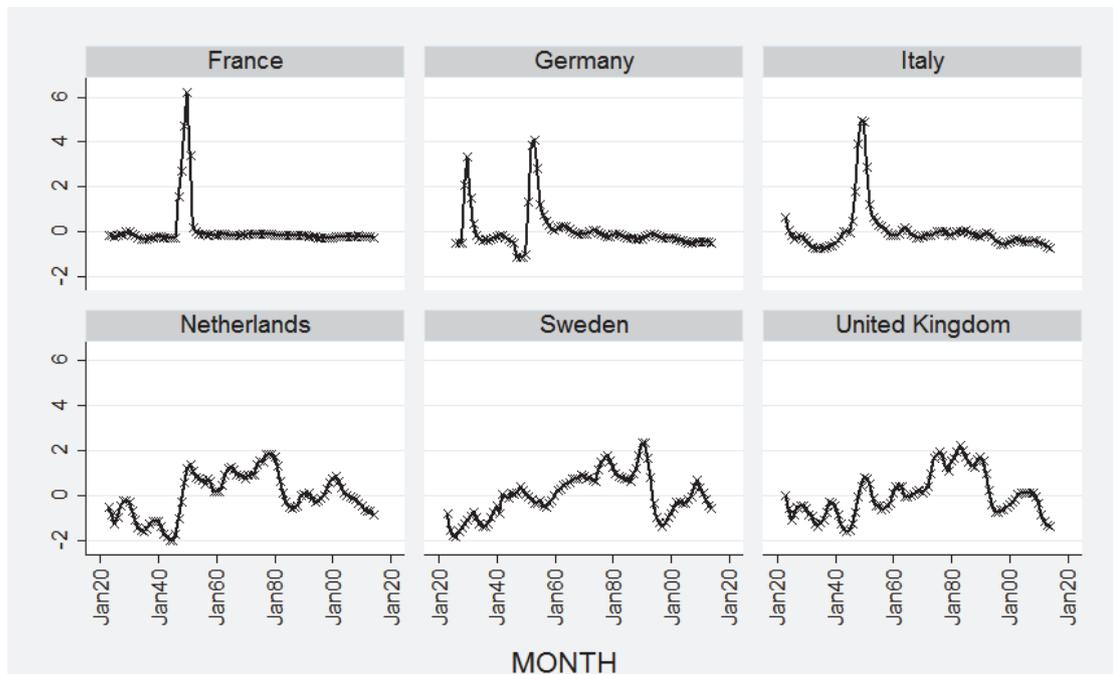
Figure 3: Long-run BBI for stocks



For the sake of brevity we do not report results for other time horizons. These results are comparable both within and across time series. This indicator measures the pervasiveness of any given boom or bust. Intuitively, it shows whether a boom or a bust affects very long-run returns in the Z matrix (when $n > 30$ months). All BBIs present positive skewness and, have fat tails, so extreme values to both sides of the median are to be expected.

The following figure presents the long-run BBIs for net loans. Since original data have a yearly frequency, we linearly interpolate the missing data to obtain a monthly series. The interpolated series is shown in a continuous line while the original data points are marked with Xs.

Figure 4: *BBIs for net loans using linear interpolation between data points*



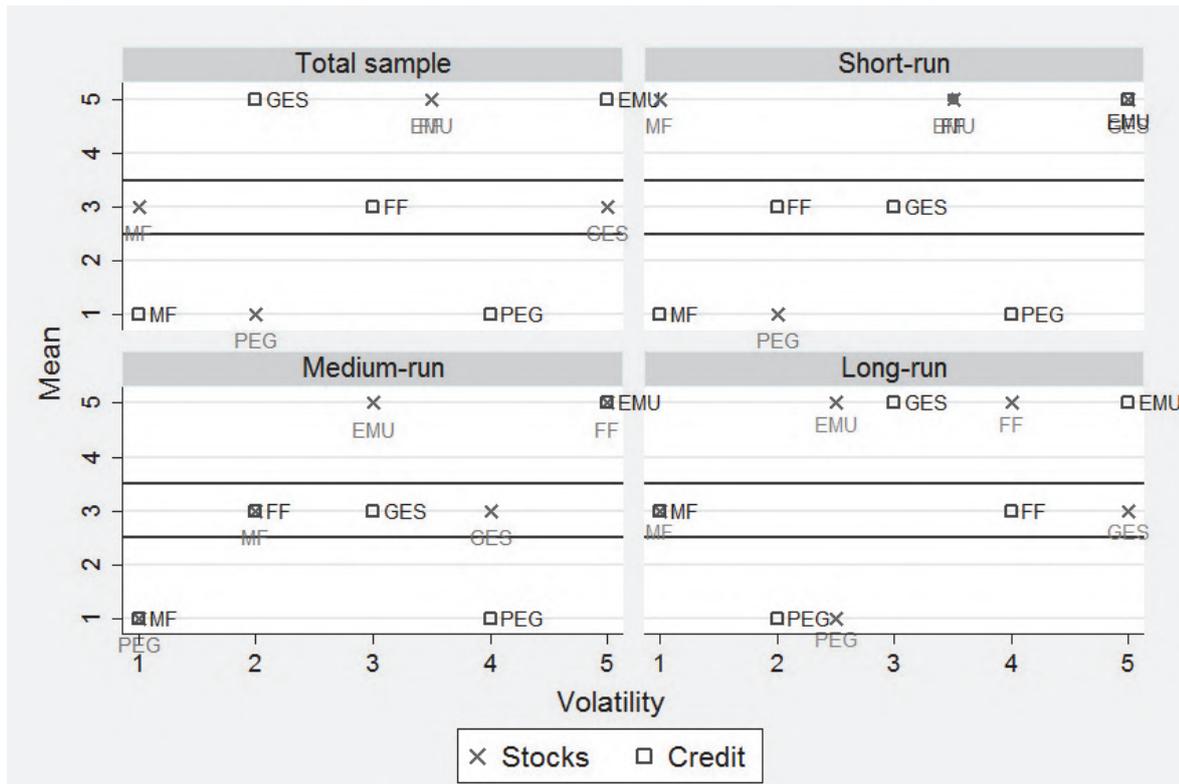
The credit BBIs for France, Germany and Italy have a positive skewness and excess kurtosis, while the value of these statistics is negative or close to zero for the Netherlands, Sweden and the UK. There is evidence of large extreme values for the countries in the top panels. Results for the countries in the bottom panel are less extreme.

5. Mean-variance ranking

In order to rank the regimes according to their elasticities, first we will run fixed effects panel regressions of the regime dummies on the different specifications of BBIs for the stock market and credit with interpolation. This is comparable to performing a difference in means test. A first important result from this stage is that the F test indicates that dummy variables are jointly statistically significant, thus providing an indication that the monetary regime does play a role in the evolution financial cycle. Second, we will treat the variance of BBIs as a measure of risk and test if these are contingent on the monetary regime in place by performing pairwise variance ratio tests with 95 per cent confidence.

We use the statistically significant differences in means and variances to build two rankings of regimes according to the mean and volatilities of BBIs for stocks and credit for each time horizon. Results are summarized in scatter plots where the X axis represents the variance and the Y axis represents the mean of BBIs. If regimes fall within the horizontal lines in any of the plots there is no statistically significant difference (in mean) between these regimes and all others. Results for the stock market are labelled in grey below the marker.

Figure 5: Mean variance plots for stock market and credit BBIs by regime and horizon



According to the definition provided earlier, the less elastic regimes would be concentrated closer to the origin, with lower propensity to booms (mean) and lower dispersion (volatility) of BBIs, while the more elastic regimes would appear in the north-east corner of the graphs. In the short and medium-run, while the least elastic regime for stocks would be the peg rate, credit would benefit most from the managed float arrangement. In the long-run the peg rate seems to be the least elastic for both credit and stocks. When looking at the total sample, a combination of managed float for credit and peg rates for stocks seems like the best combination. An important result is that there is no strictly dominating regime that favours financial stability at all time horizons.

Under the gold exchange standard stocks markets are more volatile than credit and, in the long-run, credit is more prone to booms. Conversely, the peg rate is the least prone to booms of all regimes while conclusions on volatility are difficult to reach. The managed float regime is the least volatile of all except for stocks in the medium-run and, where statistical evidence on means is conclusive, is the least elastic regime. The free float regime is one of the more elastic ones for stocks and one of the more volatile for credit (for the latter we can make no inference about the mean). Finally, the EMU is consistently one of the more elastic regimes for both series at all time horizons.

6. Concluding remarks

The contributions of this paper are twofold. On the one hand the BBIs constitute a new variable that provides a measure of direction and intensity for the financial cycle at different time horizons. They perform better than 0/1 crises sequences, usual in the financial crises literature, and do not require an *a priori* definition of what constitutes a boom or a bust.

On the other hand the main results of this pioneer study indicate a role for the monetary regime on the evolution of asset prices and credit which provides evidence in favour of the “Basel consensus”. It seems reasonable that certain monetary regimes may favour the accumulation of imbalances more than others and policy makers have to take this into account when designing policy, opening up the possibility for a leaning-against-the-wind approach to monetary policy. Also, we find that some sort of currency peg favours financial stability both

in the short and long-run. Stricter pegs are favourable for controlling stock market booms but increase both short and medium-run volatility of credit growth. Finally, a nominal anchor of the currency, albeit through the gold exchange standard or the European Monetary Union appears to be insufficient in generating financial stability as evidenced by large booms and heightened volatility both in stock and credit markets.

There are three relevant caveats to this study. First, issues can arise from the use of stock market variables as proxies for asset prices. The same can be said of the definition of credit which excludes foreign creditors and loans to the financial system. A second issue relates to omitted variables since the effect of the monetary regime on the financial cycle may be contained in variables such as *per capita* GDP which are uncorrelated to the monetary regime. Finally, even though we found a relationship between monetary regimes and differences in the behaviour of the financial cycle, it need not be a causal one. However, the results of this paper are interesting, and their contributions motivate additional studies.

The most relevant future research has to do with widening the panel to include variables that proxy for the decisions in the macroeconomic trilemma both contemporaneous and lagged in order to determine if the effect of the regime on the financial cycle runs through the expected channels of monetary policy, capital flows and exchange rates.

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Determinants of industrial location: the Kingdom of Yugoslavia in the interwar period

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What determines the location of industrial activity within a country? Economic theory offers different views on why some locations may be more attractive than others. Neoclassical Heckscher-Ohlin theory proposes that industry will be attracted to locations with a comparative advantage in natural endowments and factors of production (Ohlin, 1933). New Economic Geography models stress the interaction of transportation costs with economies of scale and linkage effects in creating geographical concentration of industries (Krugman, 1991).

In the last two decades there has been a broad range of empirical studies on the relative merit of Heckscher-Ohlin and New Economic Geography theories in explaining the location of industry. Most notably, Midelfart-Knarvik et al. (2001) developed a model of industrial location based on microeconomic foundations which allowed for empirical testing of theoretical predictions. They used the model to empirically estimate the location of industry in the European Union (1970-97). The model then diffused through the field of Economic History [see Crafts & Mulatu (2005, 2006), Wolf (2007), Klein & Crafts (2012), and Martinez-Galarraga (2012)].

A broad consensus exists in the literature that Heckscher-Ohlin and New Economic Geography theories are not mutually exclusive but can influence the location of industrial activity simultaneously. Crafts & Wolf (2014) opened a new chapter in the literature by showing that Path Dependence can also help explain industrial location. The present paper contributes to the literature by quantifying and comparing the explanatory power of all three theories – Heckscher-Ohlin, New Economic Geography, and Path Dependence – using panel data econometrics.

The location of industry in interwar Yugoslavia is used as a testing ground for several reasons.⁵⁴⁰ Research on the region (South-East Europe) and type of economy (late industrializing) is in short supply. New Economic Geography studies often employ external shocks to identify the mechanisms behind the location of industry (Redding, 2010). The changing of borders following World War I was a severe shock that brought exogenous variation in the access to markets faced by new Yugoslav territories. From the perspective of New Economic Geography, Yugoslavia is thus a particularly well-suited case for a study of industrial location determinants.

Industrial location

Yugoslavia came into existence in December 1918 following the end of the First World War and the dissolution of various European Empires. It was comprised of the previously independent Kingdoms of Serbia and Montenegro (both gained internationally recognized independence from the Ottoman Empire in 1878) and several former Austro-Hungarian lands (Bosnia-Herzegovina, Croatia-Slavonia, Dalmatia, and parts of Banat, Carniola and Lower Styria). Institutional integration of new Yugoslav territories proceeded quickly. The first Yugoslav constitution was enacted already in 1921. In accordance with the policies of the International Labor Organization the constitution guaranteed social security to workers. The

⁵⁴⁰ The Kingdom of Serbs, Croats and Slovenes, established in December 1918, officially changed its name to the Kingdom of Yugoslavia in 1929. The conventional term ‘Yugoslavia’ is used throughout the paper. The following transliteration rule is applied: use common English language translation (e.g. Yugoslavia or Belgrade) when possible and the original (e.g. Vojvodina or Ljubljana) otherwise.

1922 Law on the Protection of Workers regulated employer-worker relations and entrusted the implementation of social insurance to the Central Office for the Insurance of Workers (*Središnji ured za osiguranje radnika*, henceforth SUZOR). In 1932 SUZOR started reporting detailed data on the number of insured workers in its monthly journal called *Protection of Workers* (SUZOR, 1932-41). This publication is the best available source for the measurement of industrial location across interwar Yugoslavia as it provides regionally disaggregated cross-sections on the number of state and privately insured workers across a wide range of economic activities for the period 1932-9.

Map 1: Administrative division of Yugoslavia into eight regions, 1921



Sources: own GIS map based on corresponding map from (Kraljevina Jugoslavija, 1932).

Notes: Only mainland Yugoslavia is shown.

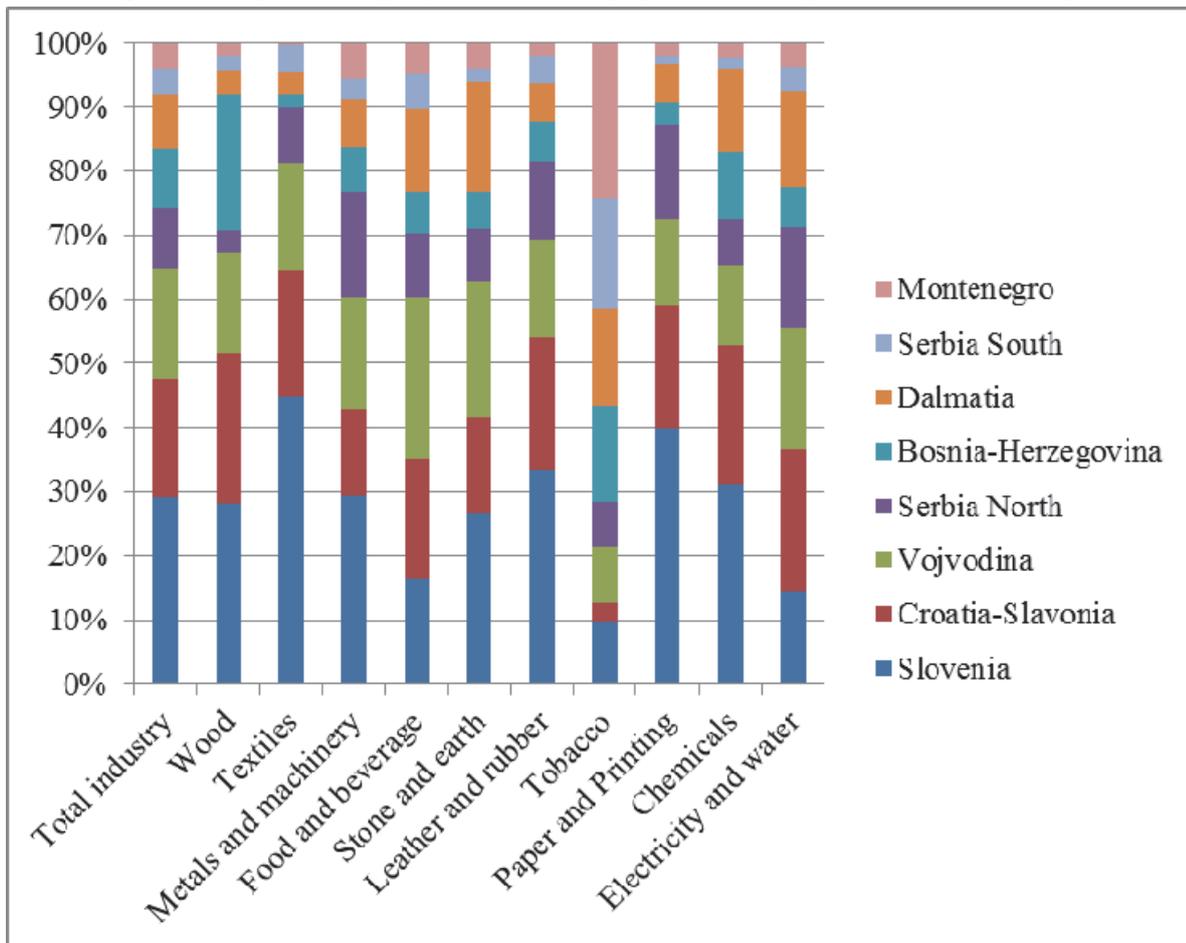
SUZOR data have been aggregated to fit the 1921 administrative division of the country into eight regions – Slovenia, Croatia-Slavonia, Vojvodina, North Serbia, Bosnia-Herzegovina, Dalmatia, South Serbia, and Montenegro (see Map 1).⁵⁴¹ The industrial dimension of the dataset consists of ten industrial categories: wood (including wood manufactures), textiles, metals and machinery, food and beverage, stone and earth, leather and rubber (including rubber manufactures), tobacco, paper and printing, chemicals, and electricity and water supply.

Figure 1 presents regional employment shares of insured industrial workers (population weighted, 1932-9 average). The regional employment distribution of total industry is shown in the far left column. The remaining columns report the regional

⁵⁴¹ Administrative regions can roughly be compared to present day countries. Slovenia, Bosnia-Herzegovina and Montenegro mostly correspond to the three present-day countries of the same name. Present day Croatia resembles the sum of Croatia-Slavonia and Dalmatia. The sum of Vojvodina, North Serbia and South Serbia is best compared to present day Serbia and Former Yugoslav Republic of Macedonia (FYROM) taken together.

employment distribution of each specific industry. The most industrial region was Slovenia accounting for almost 30 per cent of total industrial activity. The North-West (Slovenia, Croatia-Slavonia, and Vojvodina) was the most industrial part of the country employing two-thirds of all industrial workers. The rest of industry was distributed across North Serbia, Bosnia-Herzegovina, Dalmatia, South Serbia, and Montenegro (in that order). More than half of each industry (except tobacco) was located in the North-West. In seven out of ten industrial categories Slovenia had the largest share, and in all cases (bar tobacco) the leader was from the North-West.

Figure 1: *Regional employment shares (population weighted, 1932-9 average)*



Sources: own calculation based on (SUZOR, 1932-41) and (Kraljevina Jugoslavija, 1937).

Notes: Industries are ordered by employment shares from largest (wood industry) to smallest.

Empirical framework

The model of Midelfart-Knarvik et al. (2001) allows us to test the predictive power of Heckscher-Ohlin, New Economic Geography, and Path Dependence theories in explaining industrial location. The intuition behind the model is that regions have different characteristics and industries vary in the intensity of use of those characteristics. The interplay between regional and industrial characteristics produces the main variables of interest that potentially explain the location of industry. A new dataset on Yugoslav regional and industrial characteristics was created using a vast range of domestic sources published by government ministries, directorates, statistical offices as well as the central bank (for details see Nikolić, 2016).

Table 1: *Heckscher-Ohlin, New Economic Geography, and Path Dependence theories captured through interactions of regional and industrial characteristics*

Theory	No.	Interaction	Regional characteristic	Industrial characteristic
I Heckscher-Ohlin	1.	Coal energy	= Coal prices	* Coal intensity
	2.	Wood energy	= Wood prices	* Wood intensity
	3.	Unskilled labour	= Unskilled labour wages	* Unskilled labour intensity
	4.	Human capital	= Literacy rates	* Skilled labour intensity
	5.	CB capital	= CB credit allocation	* Capital intensity
	6.	Innovation	= Patent announcements	* Patent intensity
II New Economic Geography	7.	Sales linkages	= Market potential	* Sales to industry
	8.	Input linkages	= Market potential	* Inputs from industry
III Path Dependence	9.	Path dependence	= Inherited industry ratio	* Capital intensity

Table 1 shows how Heckscher-Ohlin, New Economic Geography, and Path Dependence theories are captured through the interactions of regional and industrial characteristics. The two energy interactions are expected to be negatively related to industrial location – industries with a high use for coal and wood energy will be attracted to regions where these energy sources are relatively cheap. The unskilled labour interaction is also expected to be negatively related to industrial location – regions with low labour costs will be attractive to industries intensively using unskilled labour. The human capital interaction is expected to be positively related to industrial location – regions with the highest literacy rates will attract industries intensively using skilled labour. Capital and patent intensive industries will be attracted to regions with a high relative share of central bank credit and patent announcements hence a positive sign is expected in both cases. New Economic Geography forces are captured by interacting market potential with either sales or input linkages. Both interactions are expected to have a positive sign as industries with stronger ties to industrial consumers or suppliers will tend to locate closer to larger markets. Path Dependence is controlled for by the interaction of the inherited industry ratio (ratio of factories created before and after the establishment of Yugoslavia) and capital intensity. A positive sign is expected as capital intensive industries with high sunk costs will tend to be located in regions with a high share of inherited industry.

Econometric results

The baseline econometric equation to be estimated can be written as:

$$\ln \text{LOCATION}_{ik,t} = \alpha + \beta_n \text{INTERACTION}_{ik,t} + \gamma_m \ln \text{REGION}_{i,t} + \delta_m \text{INDUSTRY}_k + \varepsilon_{ik,t} \quad [1]$$

where $\text{LOCATION}_{ik,t}$ is the population weighted share of region i ($i=8$) in the total industrial employment of industry k ($k=10$) at time t ($t=8$); $\text{REGIONS}_{i,t}$ is a set of m ($m=8$) regional characteristics varying over regions and time; INDUSTRY_k is a set of m industrial intensities varying over industries only; $\text{INTERACTION}_{ik,t}$ is a set of n ($n=9$) interaction variables varying over regions, industries, and time; α is a constant, and $\varepsilon_{ik,t}$ an error term.⁵⁴²

⁵⁴² The specification is based on Midelfart-Knarvik et al. (2001) and natural logarithms are taken accordingly.

Table 2: Pooled OLS estimation of the determinants of Yugoslav industrial location, 1932-9

	Model 1	Model 2
I Heckscher-Ohlin		
Coal energy	-0.0077 (0.215)	-0.0038 (0.391)
Wood energy	-0.0030 (0.924)	-0.0036 (0.886)
Unskilled labour	0.0016 (0.699)	0.0020 (0.488)
Human capital	0.0052*** (0.000)	0.0055*** (0.000)
Innovation	0.0004 (0.811)	0.0004 (0.814)
CB capital	-0.0268 (0.753)	-0.0210 (0.783)
II New Economic Geography		
Sales linkages	0.3579 (0.864)	0.3339 (0.877)
Input linkages	3.6355*** (0.003)	3.5141*** (0.004)
III Path Dependence		
Path dependence	0.4669*** (0.002)	0.3832*** (0.000)
Region, industry, and time FE	NO	YES
Observations	640	640
R ²	0.577	0.609

Notes: *** denotes statistical significance levels of 1 per cent. p-values in parentheses. Standard errors are clustered on the regional dimension. Models 1 and 2 report estimated coefficients on interaction variables. Full regression results are available upon request.

Table 2 shows econometric results of pooled ordinary least squares (OLS) estimation of the determinants of Yugoslav industrial location. Model 1 estimates equation [1]. To account for potential omitted variables and measurement issues, in model 2, region and industry fixed effects substitute for regional and industry controls.⁵⁴³ Also, time fixed effects are included in model 2 in order to capture any time-variant shock process affecting all regions and all industries equally. Both models are estimated with cluster robust standard errors on the regional dimension. The middle portion of table 2 reports coefficients of interaction variables. The bottom part of the table provides information on the inclusion of fixed effects, the number of observations and the share of explained variation (R²). Cross-sectional data are pooled over time which results in 640 observations. Models 1 and 2 explain 57.7 and 60.9 per cent of the variation in the location of industry. In both models the same three interaction variables stand out. Human capital, input linkages, and path dependence are highly statistically significant and estimated with the expected positive sign. Heckscher-Ohlin, New

⁵⁴³ Wolf (2007, p.36) and Klein & Crafts (2012, p.786) employ this estimation strategy.

Economic Geography, and Path Dependence theories each have one statistically significant representative.

To ascertain the relative economic significance the theories standardized beta coefficients of statistically significant interaction variables are calculated and their magnitude is compared. According to the relative shares of standardized beta coefficients New Economic Geography effects were the strongest (58.5 per cent), followed by Heckscher-Ohlin (26.3 per cent), and Path Dependence (15.2 per cent). While all three of the tested theories mattered, New Economic Geography forces were the dominant drivers of Yugoslav industrial location.

New Economic Geography effects are identified through the interplay of market potential and input linkages. Regions with high market potential (e.g. Slovenia, Croatia-Slavonia) providing easier access to supplier markets exhibited a pull on industries with a high use of intermediates in the production process (e.g. chemicals, metals and machinery). The key comparative advantage driving industrial location was human capital. Skill intensive industries (e.g. paper and printing, metals and machinery) were attracted to regions with a highly literate workforce (e.g. Slovenia, Croatia-Slavonia, and Vojvodina) able to serve such industries. Part of industrial location was determined by Path Dependence. Capital intensive industries (e.g. stone and earth) were mainly located in regions where pre-1918 factories were more numerous (e.g. Vojvodina and Slovenia). The relocation of capital intensive industries was prohibited by high sunk costs in buildings and equipment.

Robustness

Industrial location may be endogenous to market potential. Two-stage least squares instrumental variable (2SLS-IV) estimation is used to empirically disentangle the possible endogeneity. Market potential of a region is instrumented with the inverse distance between a regional capital and the capital of Yugoslavia's largest trading partner. 2SLS-IV estimation results are firmly in line with pooled OLS estimation. All three theories play a role in driving industrial location. The same regressors are statistically significant and estimated with the expected positive sign. A series of other robustness checks have been performed and the results remain qualitatively unchanged. The results are robust to: all permutations of the baseline pooled OLS estimation with region, industry, and time fixed effects; alternative specifications which exclude insignificant regressors; using few-cluster robust standard errors; and controlling for spatial correlation in the error term.

Conclusion

What determined the location of industry in interwar Yugoslavia? Using panel data econometrics and a novel dataset on interwar Yugoslavia the predictions of three theories – Heckscher-Ohlin, New Economic Geography, and Path Dependence – are quantified and compared. Results show that all three theories mattered but New Economic Geography forces played a dominant role.

The results reinforce the consensus view in the literature that several theories can simultaneously explain the distribution of industrial activity, and offer additional empirical evidence in line with the recent findings of Crafts & Wolf (2014) who show that sunk costs can affect the location of industry. Therefore, future research should consider Path Dependence as a force that can potentially determine industrial location in addition to Heckscher-Ohlin and New Economic Geography forces.

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Local logic of production: spatial organization of the Istanbul textile industry, 1950-80

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In periods of crises and drastic socio-economic transformations, some industries appear to be extraordinarily fragile, whereas others are significantly resilient. This phenomenon could be explained via analysing its organizational structure and its organic bonds to the geography on which they operate. In this context, the textile industry is highly appealing as it always remains essential in the economy and the composition of its organizational components is highly intricate. Therefore, this paper will try to present an alternative history of textile industry in Istanbul by focusing mainly on its spatial organization. Textile manufacturers of Istanbul between 1950 and 1980 are particularly classified and spatially pursued as whether their decisions of being vertically integrated or disintegrated.

It has been decades since the location decisions of the firms are regarded as a crucial component of economic structure analyses. However the recent data-driven studies in the field of economic history have not usually been very involved with this. Focusing on what has happened (or is happening) in the space may offer a great deal of information that could have easily been neglected by an aggregate point of view to the industry. Regarding the process of industrialization has too much to do with the process of urbanization; a spatial approach to the industrial settlement decisions in particular periods can provide a valuable complementary approach to the economic history literature.

The principles of the location theory were developed in the early nineteenth century by von Thünen (1826) as a model for agricultural land use variations with respect to their distances from the market. Geography, then introduced into the economics as the term “industrial district” was coined by Alfred Marshall (1890) as he explains the mechanisms and strategies behind the concentration of specialized industries in particular localities.⁵⁴⁴ Alfred Weber (1929), on the other hand, analyses the location decision of the individual firm as its distance to the raw materials and there is no interaction with other firms accounted in this model.⁵⁴⁵

In the more recent literature, the basic approaches on the importance of the location of the industry can be broadly divided into two main branches. The first is the theoretical framework that primarily aims to describe the economic organization model rather than adopting a spatial perspective. This approach finds its best representation in the “New Economic Geography” school, which put forth a model in the early 1990s to explain global mechanisms behind industrial location. The idea is based on transport cost minimization and scale economies, and therefore on globalization and regional inequalities and divergence.⁵⁴⁶ Although the model is an economic equation set up based on an international two-region system, it may also relate to the mechanisms in the city level as it is a model of geographical concentration of manufacturing and urban agglomeration established on the “interaction of economies of scale with transportation costs” as Krugman (1990) pointed out.

Perhaps this is a useful perspective to draw an international perspective for analysing the capital-flows and the interrelated decisions of the firms within the spectrum of a certain perspective. It could be claimed, on the other hand, that this technique of analysis undermines the locational factors and tries to build a model solely on microeconomic rationale. Amin and

⁵⁴⁴ For more recent accounts, see Belussi and Caldari (2009); Fujita (2010).

⁵⁴⁵ See Massey (1973) for the classification and a critical approach to the location theories.

⁵⁴⁶ For further theoretical considerations on new economic geography, see Krugman (1990); Krugman and Venables (1995); Krugman (1998); Crafts and Venables (2001); Fujita (2010).

Thrift (2000) brought a thorough criticism to this dominance of neoclassical economic theory in this literature.⁵⁴⁷ This brings up the second branch in the above-mentioned broad categorization of the approaches to the geography of the firms, in which the problem is described mainly as a relational urban issue.

Almost parallel to, and even earlier than the evolvement of this literature, a perspective on the spatial production relations was put forth by Michael Storper (1988). He formulated the idea that production relations and the production process are genuinely derived from the urban surface itself. It also determines the form of the production. In the same vein, Allen J. Scott (1983) emphasizes the interdependencies between industrial organization and intra-urban location. Among other theoretical considerations, Scott explains the dynamics and mechanisms behind organizational decisions of the firm within the urban framework. In other words, he proposes a model and goes through local cases of the decisions of vertical integration and disintegration as he put it. He both builds an economic model based on firms' cost functions, and pursues the spatial implications of the choice of being vertically disintegrated. According to this model, if the internal transaction costs are greater than the external costs, the labour process will be vertically disintegrated. This disintegration entails a complex set of spatial relations which can be called "spatial division of labour". The small production units create industrial linkages and there is no chance for them to survive as independent organisms. They exist in a system which Scott (1988) describes as a "dense assemblage of disintegrated producers".

For the case of Turkey, small-scale industry has always been a problematic issue as to whether it is the main characteristic of the republic's belated industrialization or not. Apart from this debate on their prevalence, it is a historical fact that these small production units exist in the urban area and adapt themselves to the economic circumstances of the time. Murat Güvenç (1992) analysed the spatial distribution patterns of small and large-scale establishments amongst three sides of the metropolitan area. Using the centres of gravity of the ellipses of dispersion, he came up with several results that are quite relevant within the scope of this study. First, he claims that industrial location and residential areas are determined as interconnected processes. He also illustrates that the Istanbul side (the historical peninsula) is occupied by the industries with the lowest plant sizes, lowest capital intensity, and highest chance of disintegration of the production process, whereas the Anatolian side has the opposite: large-scale plants, vertical integration, capital intensity, etc. The basic hypothesis of this study is that this pattern can be traced back to the 1950s, and the labour-intensive, skill-dependent, place-bounded industries especially on the Istanbul side can be traced through the textile industry.

Therefore, this study aims to analyse the organizational structure of the Istanbul textile industry in a period that vertical integration is mostly encouraged by the import substituting economic policies.⁵⁴⁸ The strength and the longevity of spatial linkages between the small-scale producers is another key issue. In this sense, to elaborate Istanbul's economic geography through textile industry, first, a tailored approach is offered to the intra-sectoral diversification; secondly, these sub-divisions are traced within time and the scope of the city. Although this study solely deals with the spatial characteristics of the industrial settlements, further data will be pursued in order to relate to the economic organization issues, such as labour and capital intensities, and output capacities of particular firms in particular branches in the textile industry. Thanks to the new methodology that is to be used, it is now available to analyse those economic attributes of the firms simultaneously with their spatial relations. Therefore this study could be regarded as the first step of a broader analysis on the history of spatial and economic modalities of the Istanbul textile industry.

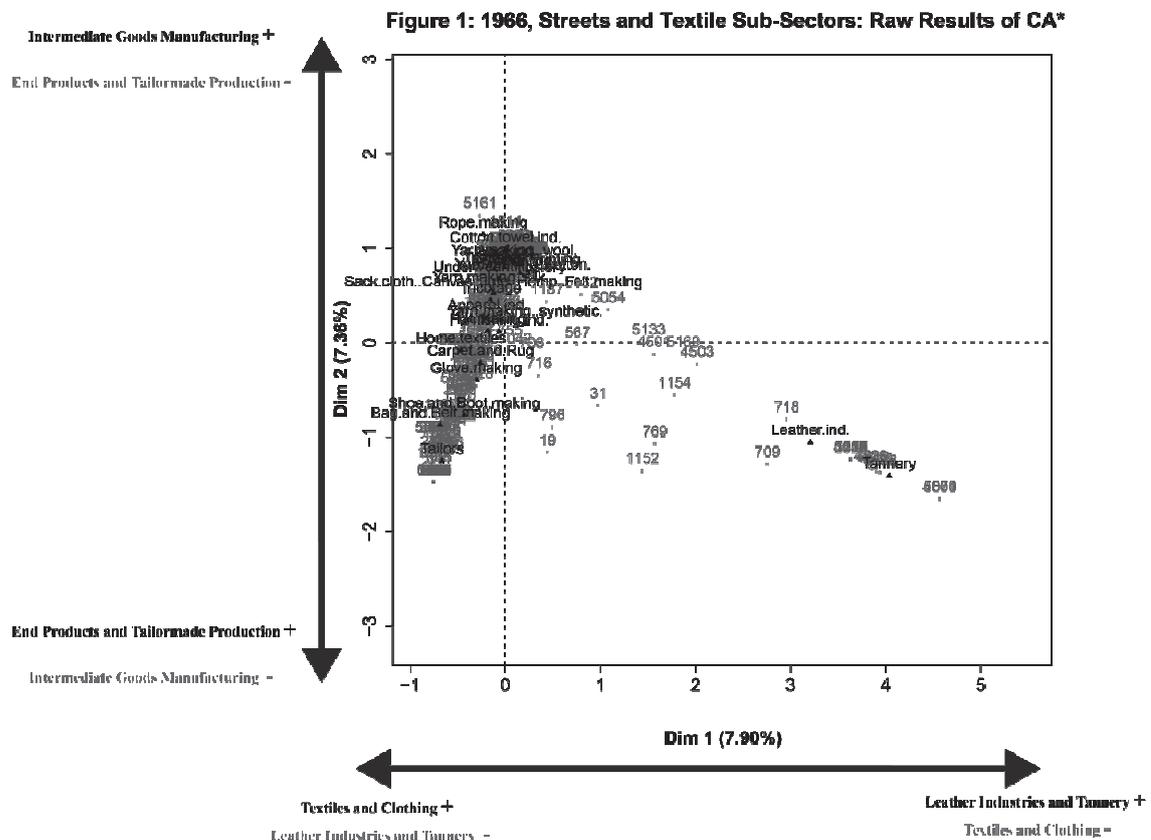
⁵⁴⁷ For a broader explanation on the possibilities of relational perspective in economic geography, see Bathelt and Glückler (2003).

⁵⁴⁸ For 1960s and 1970s.

The methodology to be used is exploratory multivariate data analysis, which enables us to determine a map of relative positions of individuals (streets in our case) and attributes (detailed economic activities) and to group the individuals based on the patterns they have. This method is based on the analytical problematizations of Jacques Bertin (1967). The same problem, in a different point of view, mathematically formulized by J. P. Benzécri (1973). This multivariate representation problem is solved by a geometric approach, in which the dataset is embodied in a multi-dimensional Euclidian space regarding their relative distances from each other. In other words, the dataset is represented as clouds of points and interpreted based on these clouds, as Le Roux and Rouanet (2006) explain in detail in a recent account.⁵⁴⁹ Using this model in spatial analyses brings a number of advantages that orthodox linear models cannot provide. Most importantly, this model does not make any assumption of linearization between variables, therefore it can provide a relational mode of representation of the economic and spatial assemblages. Moreover, it is an inductive approach that is able to generate robust research questions for further analyses.

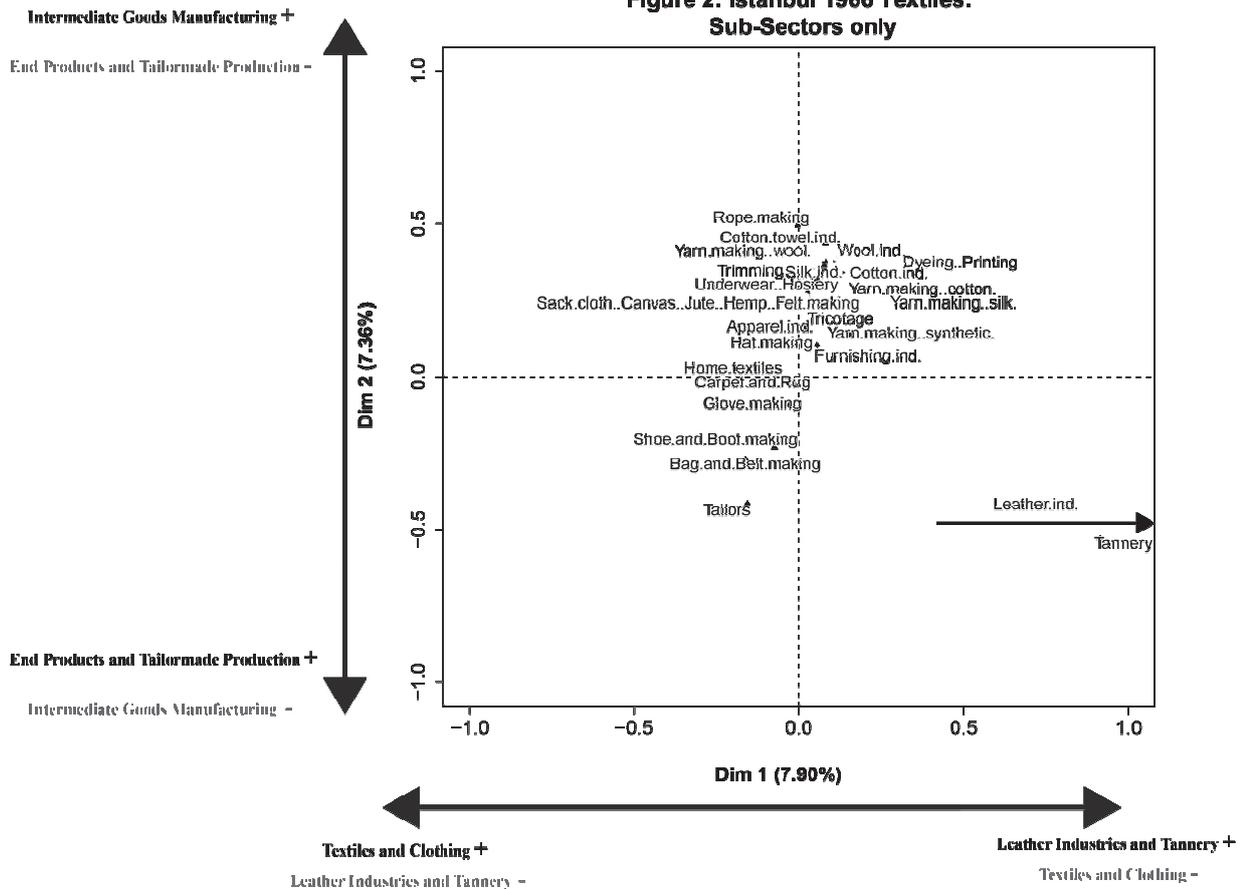
The main sources to be used are the yellow pages from telephone books from 1955, 1966, and 1978. The firms related to textiles are chosen and coded in detail. They are also coded with the streets in which they are located. The datasets are cross-tabulated and the economic activities are counted by streets. Simple correspondence analysis (CA) is then applied to represent the analytical positions of the streets prior to the mapping.

First of all, it is crucial to bear in mind that the use of telephone technology became popular during the 1960s in Turkey. Therefore, the number of cases in 1978 and 1966 are much bigger than 1955. For 1978, there are 4,607 individual firms operating in the textile industry. For 1966, the records of 2,129 firms cross-tabulated by 567 streets and 25 sub-sectors within the Istanbul textile industry. For 1955, this number is 400; 19 sub-sectors were counted by 173 streets. For all practical purposes, only the results of 1966 will be shown in this paper.



⁵⁴⁹ For the application of this model using newly developed open-source coding system, R, see Husson, Lê, and Pagès (2011).

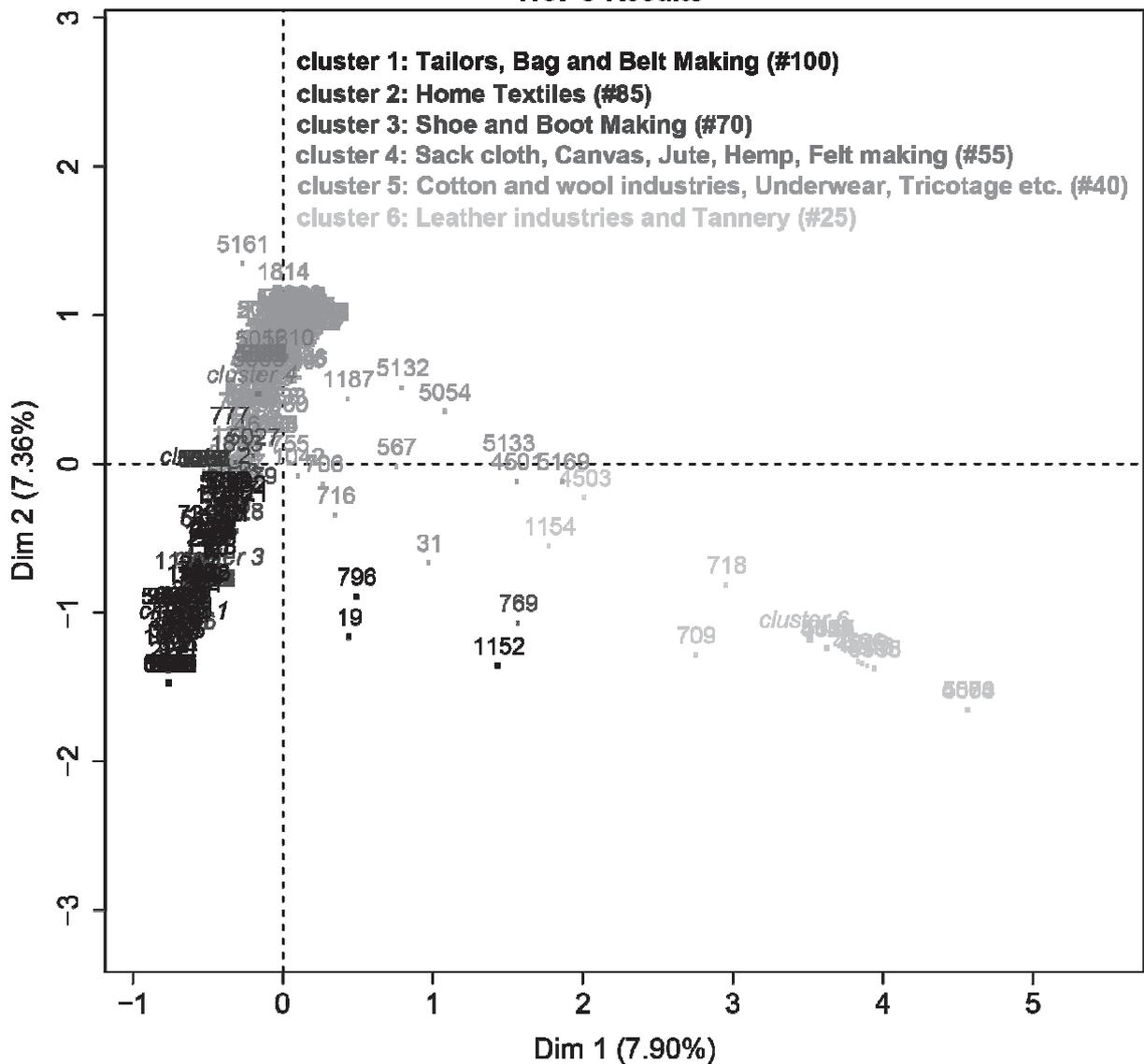
Figure 2: Istanbul 1966 Textiles: Sub-Sectors only



Here, the light gray dots represent each street, whereas the black texts are the sub-sectors of textile production. It is seen that the first dimension which illustrates the first and foremost contrast reveals that the spatial pattern of leather industries and tannery are distinctively far away from the other textile and clothing production. Second dimension, on the other hand shows the distinction between intermediate goods and manufacturing and the tailor-made production. It is also obvious that the individuals (streets) are agglomerated mainly within the intermediate production. One step further, the results can be grouped using hierarchical clustering:

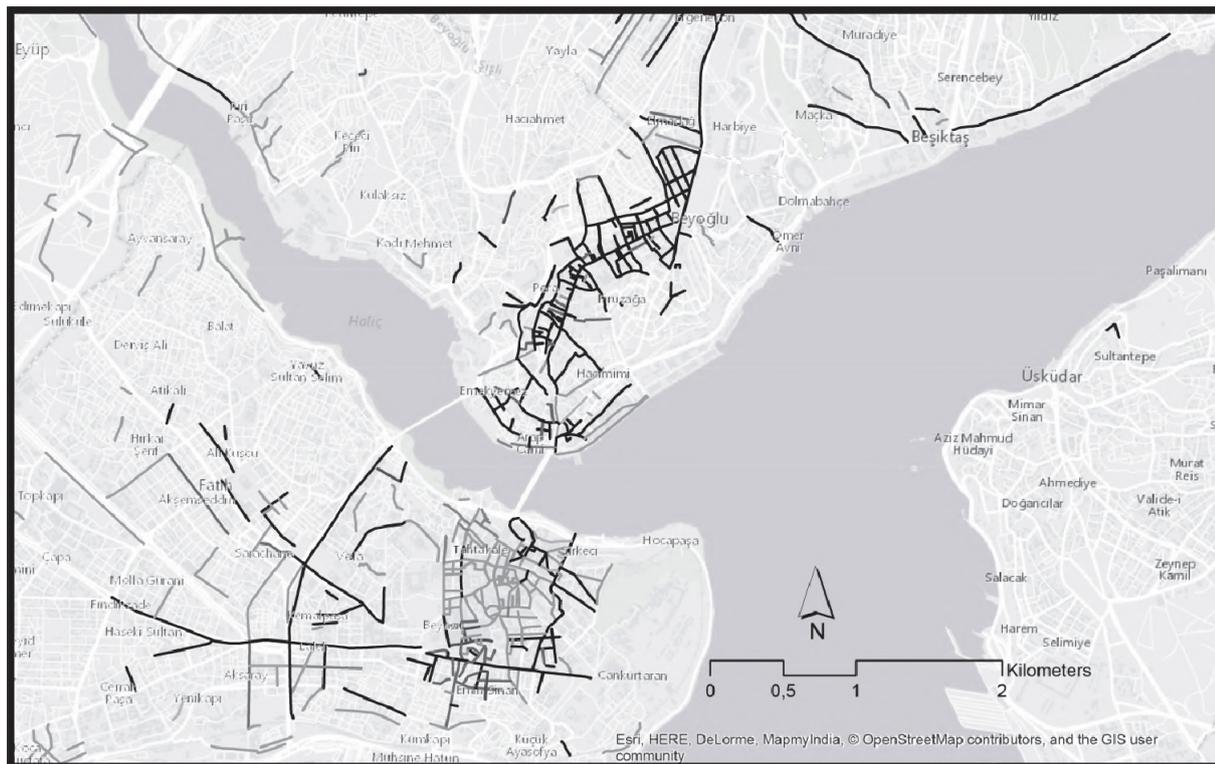
* The coloured versions of the correspondence graphs and maps will be presented at the conference in detail. Opacity degrees are given for this black & white version. For the coloured version of the figures please visit <http://bit.ly/2hgozFx>.

**Figure 3: Istanbul 1966 Textiles:
HCPC Results**



Hierarchical clustering enables us to analytically divide textile production into its co-existing elements. Since the model works in multidimensional space, it takes more parameters into account than can be seen in the two-dimensional representation. Mapping these clusters to see the street-scape of Istanbul textile industry in 1966 can provide a detailed source of analysis:

**Figure 4: Istanbul 1966 Textiles:
HCPC Results Mapped**



When the results are projected on the map, it is clearly seen that the agglomeration of this fifth cluster has a spatial meaning. In the historical peninsula, and in and around Levent, (northwest of Beşiktaş) area, there are strong spatial interconnections between these intermediate production. There are also several areas dispersed within the edges of the city are started to be specialized on this group of sub-sectors. The first cluster on the other hand, in which the tailors are overrepresented, tend to locate in the central parts of the urban area.

These are on and around the main stems, old city walls and Istiklal Street. In the sixth cluster, leather industries and tannery activities are densely populated in the Zeytinburnu region.

Although getting into clusters and asking new questions within the findings of this general analysis would be an accurate further study, this cannot be done within the scope of this short paper. However, it is seen that the fifth group in the Istanbul area and the sixth group in Zeytinburnu form a production that is vertically disintegrated, and interconnected via the street networks. In this manner, a spatial division of labour can be observed in the textile industry of Istanbul in 1966.

This paper aimed to trace the spatial and organizational characteristics of the Istanbul textile industry in a period that is mainly derived by crises and the sharp changes in economic policies. The address and sub-sectoral affiliations of textile producers from the telephone books are analysed accordingly, using exploratory multivariate data analysis. The findings from the case analysis of 1966 can be summed up in two main lines: first, there is a spatial segregation between the sub-sectors amongst the two main branches of the Istanbul metropolitan area regarding their production processes; secondly, there are strong signs of spatial division of labour within intermediate textile manufacturing and leather industry regarding their dense connections within particular regions.

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The oil industry, energy security and international development: the EEC and OPEC

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Rationale

Since the inception of the European Union at the end of World War II, energy supplies have been one of the main concerns in the European community, and a strong part of the narrative of integration. The first nucleus of a united Europe was the European Coal Organisation (ECO), set up in 1945 by the United States and the UK to coordinate supplies in the continent during a severe coal shortage, and later evolved into the European Coal and Steel Community (ECSC), the first European-level institution. However, despite integrated energy supply networks always being at the centre of the debates on integration, European countries were never able to implement a common energy strategy. This was particularly clear in the case of oil imports, which constituted the fastest rising source of energy consumption. The fear for severe energy shortages due to sudden cuts in oil supplies became an important source of concern for European governments during the fifties, when it became evident that oil was replacing coal as the most important, cheapest and effective energy source. However, in spite of the recurrent calls to implement coordinated energy policies, European governments were profoundly divided on the strategies to adopt.

On the one side, France and Italy emphasized securitization of supply, advocating the development of State and European-directed policies to control contracts, origin of supplies and energy prices. Rather than allowing private oil companies to manage oil and gas supplies, they advocated direct negotiations between producer countries and consumer countries, as part of larger issues on foreign relations. In particular, they aimed at establishing a national oil industry against the multinational oil companies, mostly Anglo-American, that had almost full control over the European oil market. On the other side, the Netherlands, Germany, and later Britain put the emphasis on low prices. They were in favour of a *laissez-faire* approach, fearing that State-led oil supplies would cause prices to soar.

These opposite views halted the development of a common strategy of energy imports within the common market. Between 1957 and 1970, in spite of growing concern for the widening energy gap in the continent, discussions on a European level with regards to energy focused on Euratom and on incentives to coal production, while imports of oil and gas were overlooked.

Between 1971 and 1973, events seemed to prove France and Italy right. First, in 1971, the agreement between the Organisation of Petroleum Exporting Countries (OPEC) and the international oil industry to raise the oil revenues to producer countries caused oil prices to rise quickly. Then, in 1973, the embargo of Arab oil producers caused the first energy shock, which realized the fears expressed since the early 1950s by advocates of import securitisation strategies. After the oil shock, discussions for an integrated energy policy, coordinated State intervention and securitisation of energy supplies were strongly revived within the EEC, with a renowned sense of urgency.

This paper aims to reconstruct the European-level negotiations with OPEC from its foundation to the 1973 oil shock, placing them in the larger context of the European-level debates on energy imports since the establishment of the EEC. In the aftermath of the energy crisis, EEC countries attempted to form an association of consumer countries, the Organisation of Petroleum Importing Countries (OPIC), to negotiate directly with OPEC without the interference of private oil companies, and to negotiate oil supplies as one bloc of consumer countries. However, the OPIC project was abandoned in favour of the looser IEA

(International Energy Agency) based in Paris but closer to the Atlantic system of Western alliance rather than to the specific needs of European countries as an importing area.

Through this analysis, the paper has three objectives: firstly, to reconstruct the problem of oil supplies in the EEC area from a historical viewpoint. Secondly, to assess whether the EEC was able to negotiate as a single body during the first energy crisis, and what was the strategy of the single actors. Thirdly, the paper aims to explore the different approaches to the energy market between advocates of State-led political and diplomatic negotiations with producer countries, and supporters of the self-regulation of free market.

The research aims to show the problems posed by the oil industry in relation to free market principles, and the frictions caused by energy issues within the system of Western alliance. Because of the radical changes in the international energy politics of the years between 1960 and 1973, the research will argue that this period opened an important window for European countries to take action in the international scene, and to coordinate their common interests as consumer countries; an occasion that in many respects was lost.

Background to the research: the European oil industry, the cartel, and OPEC

On a macro-level, by the end of the 1950s the oil industry was clearly structured around a triangulation of interests: producer countries, the international companies, and consumer countries. European State-owned oil companies, such as the French BRP and Italy's ENI, were on the side, as emerging actors trying to disrupt this asset. All parties, and including economists and analysts, agreed that the creation of a supra-natural regulatory body for prices and oil productions was needed; so far the cartel had been the only informal body existing and operating, but both producer and consumer countries, as well as the other oil companies, were showing signs of distress.⁵⁵¹

Paul Frankel, the most renowned petroleum analyst at the time, suggested that consumer countries (mostly the EEC and Japan) had to take action and form a single body representing the interests of consumer countries; as one body, they would be able to influence prices and consumption.⁵⁵² But while the EEC seemed to be inactive and divided on common action, producer countries were becoming very active. The drop in prices in 1959, strongly resented by producer countries as a unilateral decision of the cartel, led to the establishment of the Organisation of Petroleum Exporting Countries (OPEC), within a year, in order for producer countries to coordinate negotiations with the companies and avoid playing each other off.⁵⁵³ In April 1959, the first Arab Oil Congress was organized in Cairo by the Arab League, with Nasser as the main promoter; Venezuela and Iran participated as observer countries.⁵⁵⁴ One year later, in 1960, with a conference in Baghdad held between the 10th and the 14th September, the Organisation of Petroleum Exporting Countries was established. The five founding members were Iran, Iraq, Kuwait, Saudi Arabia and Venezuela; the objective was dedicated to “the coordination and unification of the petroleum policies of Member Countries and the determination of the best means of safeguarding their interests”.⁵⁵⁵ At first, the cartel dismissed both the Arab Oil Congress and the establishment of OPEC. On the contrary, Italy and France welcomed the news, as a sign that consumer countries would soon have a single interlocutor to talk to. During the 1961 Arab Oil Congress, the Italian observer Enrico Bonomi, from the State oil company ENI, made a presentation on “The cooperation between producer and consumer countries as a factor of stability within the oil market”. ENI's

⁵⁵¹ See Middle East Economic Survey, 1960-63.

⁵⁵² Middle East Economic Survey, 28 December 1962.

⁵⁵³ See Odell, op.cit and Adelman, op.cit.

⁵⁵⁴ NATO Archives, Committee of political advisers, First Arab oil congress, Note by the Netherlands delegation, available at http://archives.nato.int/uploads/r/null/4/6/4669/AC_119-WP_59_36_3_ENG.pdf Accessed 29 September 2016.

⁵⁵⁵ MercoPress, OPEC born in Baghdad in 1960 with five members, changed the energy, 2010 [online] Available at <http://en.mercopress.com/2010/09/14/opec-born-in-baghdad-in-1960-with-five-members-changed-the-energy-world>

view was that the international oil concession system was now too old, and that direct agreements between producer and consumer States would allow for a more efficient management of the industry, lower costs of oil for consumers, and at the same time higher revenues for producer countries.⁵⁵⁶ In 1965, the signing of a cooperation agreement between France and Algeria to constitute a consortium was welcomed in France as the beginning of a new phase in the French policy for energy supplies. *Le Monde* published a report on European energy policy, stating that the Italian-French view of State intervention in oil policy had started to prevail over the liberal approach adopted so far by the other countries of the common market.⁵⁵⁷ The article reported that Germany and France had signed a declaration of intent for a common European energy policy – an event that at the American embassy in Paris was considered as a “surrender” of Germany to the French view on the oil market, and a move to weaken the expansion of the American distribution networks in Europe.⁵⁵⁸ The French oil bodies (BRP, RAP, UGP) and the German companies operating in the Sahara, Wintershall and Preussag, as well as others, created a report for the EEC that asked for preference to be given to European petroleum production.

However, despite the signing of a cooperation agreement between Europe and producer countries to the detriment of the American oil industry, and despite the strong propaganda of the oil cartel as an imperialistic tool, the opposing interests of producer countries and consumer countries started to emerge; at the same time, the cartel started to approach OPEC with a different view. In May 1970, a break in the Syrian section of the Tapline, a vital nerve of oil supplies to Europe, caused an interruption in supplies. In normal circumstances, it would have required only 24 hours to fix the break, but this time Syria refused to allow the technicians to enter the area – and required a higher transit fee. Saudi Arabia, the more moderate of the OPEC countries, threatened to cut its subsidies to Syria, but it was now a minority within OPEC. The bras-de-fer between Syria and the companies was only concluded in January 1971, when the country obtained a higher tariff; the pipeline was fixed overnight.⁵⁵⁹ Meanwhile, oil prices had started to rise again after several independent US companies agreed to pay to Libya 55 per cent of oil revenues instead of the usual 50 per cent, causing a domino effect that was completed on the 23rd of February 1971, when the cartel signed an agreement with OPEC in Teheran by which all producer countries demanded an immediate rise from \$1.79 to \$2.17 per barrel on crude, an increase of about 11 per cent per year, and taxes on revenues to 55 per cent.⁵⁶⁰ For the companies of the cartel the agreement was not such a negative step, as they could offload the payment of the extra revenues to consumer countries – the start of a price increase that would spike in 1973 with the embargo. For European countries, however, the rise in prices confirmed all the worries on the European double dependence from Middle East reserves managed by multinational oil companies; a dependence that France and Italy had tried to fight.

On the 21st of April 1971, the French Prime Minister Jacques Chaban-Delmas made an official statement in front of l'Assemblée Nationale, saying that it was a crucial moment for France and its relations with Europe and Algeria. Algeria was breaching an agreement signed with France in favour of an agreement signed between the cartel and OPEC countries. This way, all the principles of long-term State-State cooperation were abandoned in favour of an immediate increase in revenues that was engineered by the cartel at the expense of consumer countries. In fact, the cartel had agreed to an increase in tax revenues because it could simply pass the costs to the consumer countries. For France, it was a blow not because of the nationalizations per se, but because the agreements amongst OPEC and the

⁵⁵⁶ Yakan, op.cit.

⁵⁵⁷ NARA RG59 - 1386, report to the Department of State from the American Embassy in Paris, 21 July 1965.

⁵⁵⁸ Ibid.

⁵⁵⁹ Adelman, op.cit.

⁵⁶⁰ For crude from the Persian Gulf (34°API); in Adelman, op.cit.

international companies were put before an agreement established with France and ratified through a law.⁵⁶¹

After almost fifteen years, which were also the heydays of European economic development, oil prices started to rise again. The Teheran agreement represented the first time in the history of the oil industry in which producer countries agreed upon a tax rise that increased prices worldwide. However, as highlighted by France, it was the consumer countries, not the companies, that paid the price. The OPEC-cartel agreement cost Europe 1.7 billion dollars a year. In a report to the Italian Parliament, the head of ENI Eugenio Cefis used similar words to Chaban-Delmas, explaining the reason for the price increase. More than attacking the companies of the cartel, however, he made a strong requisitory against the inability of consumer countries to coordinate. The current oil crisis, explained Cefis, was caused by the fact that seven companies controlled 70 per cent of crude oil produced in the world outside the US and the communist countries, and that price formation was a truly global matter, with the US market as the point of reference. Furthermore, companies in the US had strong fiscal advantages which allowed companies, in Teheran, to refuse the requests of producer countries only when they could not offload the costs on to the consumers. The increase in price was indeed a positive element for the companies. The lessons to learn from Teheran, stated Cefis, were that oil companies were no longer in control of the actions of producer countries; that they did not and would never defend the interests of consumer countries; and that they were not able to guarantee security of supplies for the future. Cefis warned that for this reason, “A common oil policy is indispensable for the importing countries in the general landscape of the economic and energy situation”. Cefis stressed that consumer countries had to get together and form a united front. The alternative was, as indeed it happened for more than a decade, to have the oil industry ruled by a new oligopoly: that of OPEC.

⁵⁶¹ TOTAL Archives, CDS, Algérie-Pétrole.

French economic growth from Philip the Fair to the Revolution, 1280-1789

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Introduction

The subject of this study is the French economy (an economic system including about 30 per cent of the population of Western Europe) between the thirteenth and the eighteenth century. While most contributions either analysed the economic performance of parts of this economy, characterizing the agrarian cycles of some regions (Le Roy Ladurie, 1966), or constructed national indices of production from the eighteenth century (Toutain, 1987), this work is an attempt to provide a systematic quantitative reconstruction of the economic performance of the entire system from the phase of early state formation to the Revolution.

Method

Output estimates are obtained using the so called ‘demand side’ approach following a two-step procedure. In the first step the exercise involves computing agricultural output per capita (y_A) using estimates of agricultural consumption per head (c) adjusted for international trade:

$$y_A = r \cdot c \quad [1]$$

where r is the ratio of domestic agricultural production to agricultural consumption. Per capita consumption of agricultural products is calculated by means of a demand function that depends on real prices of agricultural (P_a) and manufacturing (P_m) products and a measure of real disposable income per head (I) according to the following expression:

$$c = I^\alpha \cdot P_a^\beta \cdot P_m^\gamma \quad [2]$$

where the variables are expressed as indices and the exponents α , β and γ sum to zero and represent the income, own price and cross price elasticities of demand, respectively.

In the second step we estimate the value of agriculture in total output following the approach developed by Nuvolari and Ricci (2013). By definition, the share of agriculture in total output (S_A) is the ratio between agricultural and total production. We assume that agricultural output depends proportionally on agricultural productivity and the number of workers employed in agriculture while total production is function of the productivity level of the entire economy and the total workforce. Assuming perfect competition in the labour market, the sectoral and global productivities are approximated by real wages in agriculture and in the overall economy, respectively. Thus, S_A ultimately depends on the ratio of real wages in agriculture (w_A) to real wages (w) and the share of working population employed in agriculture:

$$S_A = \frac{Y_A}{Y} = \frac{w_A}{w} \cdot \frac{L_A}{L} \quad [3]$$

Dividing agricultural output per capita by the share of agriculture in total output, one obtains the final expression for GDP per capita:

$$y = \frac{r \cdot (I^\alpha \cdot P_a^\beta \cdot P_m^\gamma)}{\left(\frac{w_A}{w} \cdot \frac{L_A}{L}\right)} \quad [4]$$

Data

Calculation of output per head requires all of the variables involved in equation [4].

For the eighteenth century, we estimated that the ratio of domestic production to consumption averaged 0.95. Prior to 1700, there is no indication that r differed substantially from one and we assumed that France had a perfectly balanced trade position in agricultural goods.

The own price, cross price and income elasticities were set to -0.4, 0.1 and 0.3, respectively. This parameter set reflects reasonable demand patterns in pre-industrial France and implies low absolute values of the own price and income elasticities so as to capture changes in demand of agricultural goods that were relatively less income-elastic.

In the benchmark specification we assumed that income per head was approximated by real day wages.⁵⁶² New series of rural and urban nominal day wages were constructed by assembling a new dataset. Since most French urban wages are recorded for workers in the building industry, this study concentrates on skilled and unskilled male construction workers whose salaries are assumed to be representative of urban wages. Wage data were retrieved from classic histories of wages and prices and a wide array of secondary and printed primary sources comprising the published records of several building projects between the thirteenth and seventeenth century. Overall, the dataset includes about 22,000 wage observations for the period 1250-1789 derived from 103 different sources (figure 1). The sample of wages covers several types of occupations in the agricultural and building construction sectors and has a wide spatial coverage drawing information upon 427 locations belonging to 20 regions (figure 2). Using these data, we reconstructed wage estimates controlling for spatial, occupational and time differences by means of a nonlinear piecewise OLS regression model for each of the three basic categories of workers (craftsmen, labourers, and farmers). The aggregate series of daily wages was obtained as an average of farm and non-farm wages weighted for the employment shares of agricultural and non-agricultural workers in total labour force.

⁵⁶² We explored alternative specifications of income per head considering the effect of both labour and non labour income as well as changes in the labour offer. These effects were not large enough to overturn the conclusions of this paper.

Figure 1: Wage observations per decade

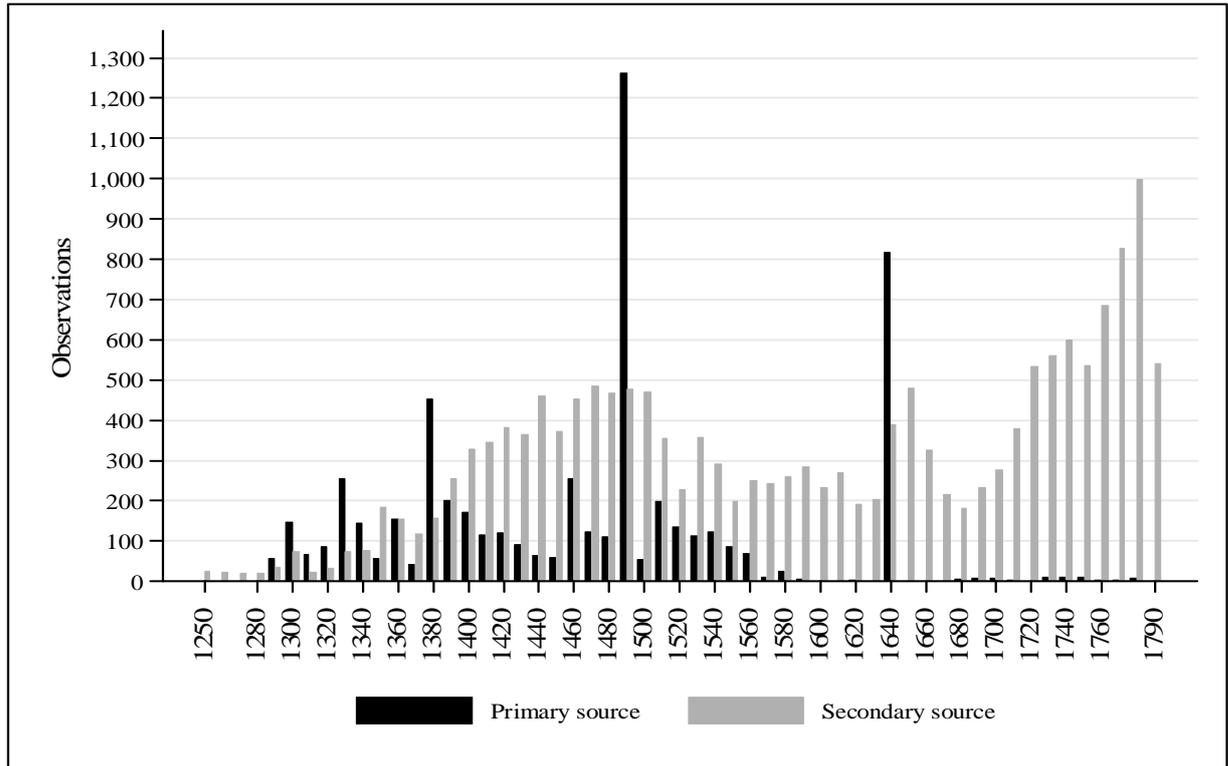
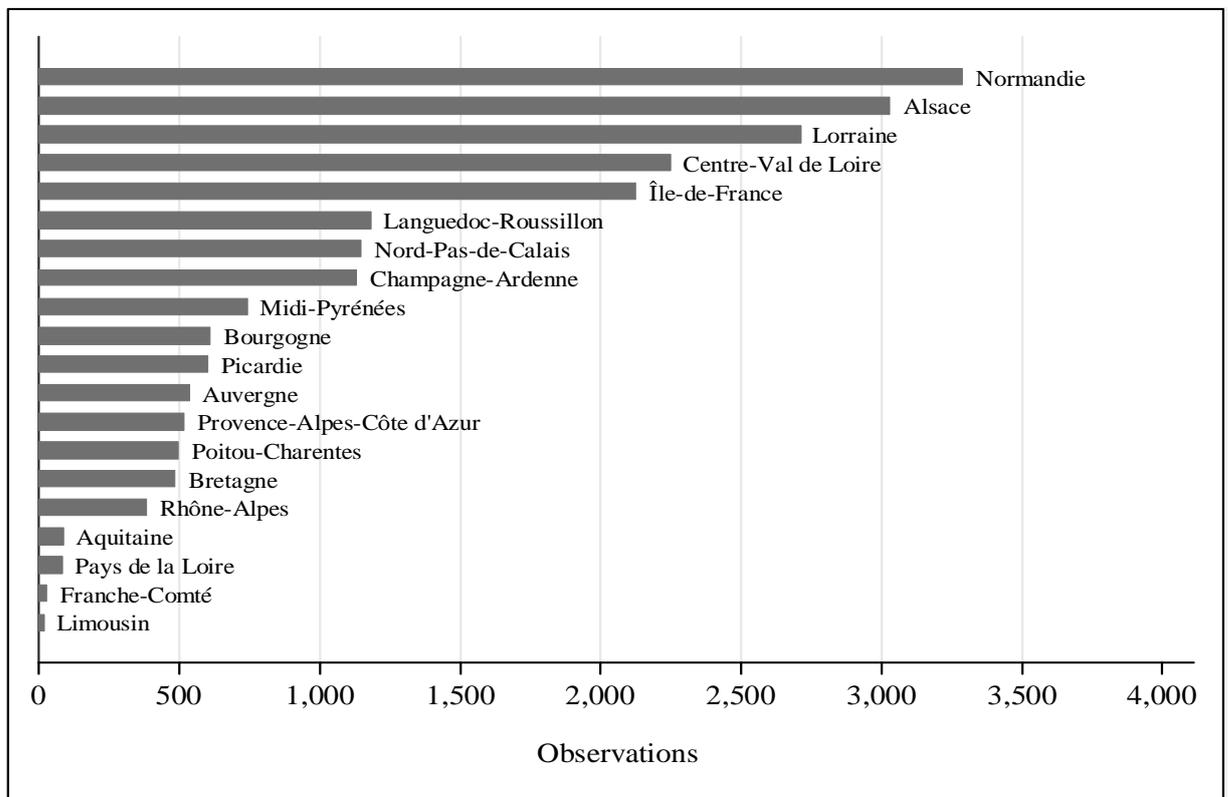


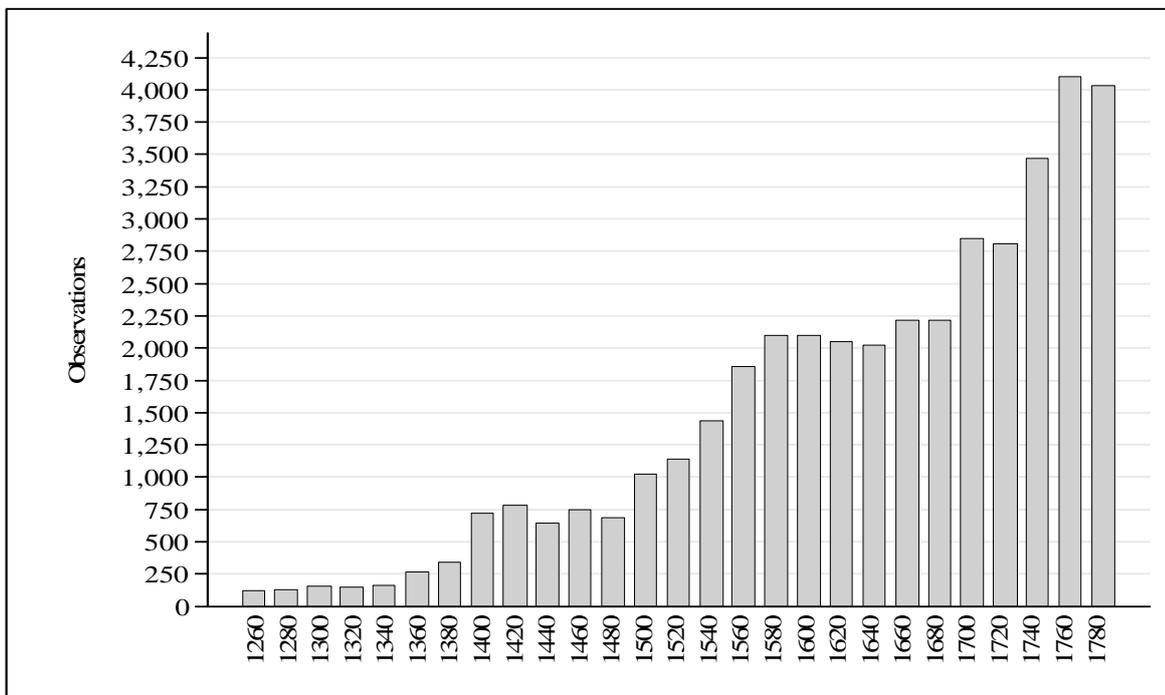
Figure 2: Wage observations per region



Drawing upon printed primary sources and institutional records, we concomitantly assembled a new dataset of prices comprising more than 49,000 observations of 26 commodities from several regions. The Centre and the North of France supply most of the price data while about 38 per cent of observations come from the South, the East and Île-de-France. At the

departmental level, Rhône-Alpes and Île-de-France provide most of the price quotes while Franche-Comté and Champagne-Ardennes are less represented in the dataset. Price trends of individual items were computed using regression analysis and the resulting series were used to construct new price indices.

Figure 3: Price observations per 20-year windows



The agricultural price index includes 15 items divided in two categories: arable and pastoral products. The arable products include cereals (wheat, oats, barley, and rye), beverages (wine), legumes (peas and beans) and firewood, while pastoral goods comprise meat (beef, mutton, pork, and chicken) and dairy (butter, cheese, and eggs). The price indices were obtained as an arithmetic weighted index of the individual price series using as weights the assumed output shares of each commodity. For the eighteenth century the weighting scheme builds upon Toutain (1961). Before 1700, due to the dearth of direct information, weights were inferred indirectly using the evaluations of contemporary authors and analysing the expenditure shares on individual items from 116 French budgets studies covering the period 1347-1789.

The price index of manufactured goods includes 11 products divided into five categories, namely textiles (linen and wool clothes), toiletries (soap), construction materials (lime and tiles), lighting (candles and oil light) and metals (coal, lead, copper, and iron). For the eighteenth century the weighting scheme elaborates on Toutain (1987) while for earlier times it mirrors the distribution by sector of eighteenth-century France but it is constructed to capture the changing structure of the economy.

Finally, nominal wages and prices are deflated using a consumer price index that reflects Allen’s (2001) barebones basket. This provides 1,941 calories per day, sufficient proteins and implies some expenditure for lighting and clothing (table 1).

Table 1: *Consumer Price Index*

Good	Unit (metric)	Weight	Daily Calories	Daily Proteins
Bread	kg	182	1221.6	49.9
Beans/peas	liter	52	160.3	10.1
Beef	kg	26	178.1	14.2
Butter	kg	5.2	103.8	0.1
Cheese	kg	5.2	53.4	3.0
Eggs	each	52	11.3	0.9
Wine	liter	91	211.9	0.0
Soap	kg	2.6		
Linen	metre	5		
Candles	kg	2.6		
Oil light	kg	2.6		
Firewood	BTU (Millions)	5		
Cal./day			1941	78

Sources: Allen (2001)

Results

Our estimates point to one important conclusion: the dominant pattern in pre-industrial France was stagnation in levels of output per capita (figure 4). At the death of Philip the Fair in 1314, France was a leading economy in Europe and output per capita averaged 900 dollars per year. 476 years later, this level was largely unchanged but the France of Louis XVI belonged to the group of the least developed countries in Western Europe. Nevertheless, stability was not the same as immobility. French economic performance was characterized by major fluctuations and these can be more suitably interpreted using a four-stage account.

The first phase corresponds to the years 1280s-1340s. Sustained per capita growth took place between the 1280s, when royal power in France reached its medieval apogee during Philip's IV reign, until the first decades of 1300, when a series of subsistence crises and then the Hundred Years War interrupted it. Over this period, population was on the rise (0.4 per cent per year) while output per capita increased by about 30 per cent passing from 700 to c.1,000 dollars per year (figure 5). This episode of growth has a double significance.

First, it was a turning point in French economic history until up the industrial revolution. Second, it suggests that in the pre-plague period the distribution of incomes by country was more complex than implied by the common divide between the rich Mediterranean Europe and the relatively backward North Sea Area. Indeed, starting from low levels of income per head, France overtook Britain and Holland and caught up the richest parts of Europe (Italy and Spain) before 1348. Thus, French relative prosperity by the modern era can be dated back to the pre-plague period, a pattern that contrasts with the experience of most European countries where the higher standards of living were reached by the mid-fifteenth century, in the decades after the Black Death. We speculate that this episode of growth was deeply entrenched with the process of French state formation and its ramifications on real wages through changes in class structure and property relationship (Brenner, 1976). Indeed, one distinctive feature that emerged in the phase of expansion of the royal domain was the progressive erosion of the traditional structures of seigniorial control as a result of the political activities of the crown. Royal intervention together with demographic forces seemingly changed the very organization of the manorial system fostering the precocious decline of serfdom, the leasing of a growing proportion of demesne lands for fixed rental payments and the consolidation of villain and small peasant landholdings (d'Avenel, 1894).

We tentatively suggest that these factors modified the structure of the labour market fostering transition from an economy of serfs to an economy of free peasants and day labourers. With freed serfs becoming owners and workers consolidating their peasant property in relation to the development of the French state, an increasing share of workers had larger outside options and greater bargaining power vis-à-vis lords. This fact seemingly induced an upward pressure on wages and thus on output.

The second phase corresponds to the post plague era covering the period 1340s-1560s. Figure 5 documents the Malthusian response of the French economy to the mortality shock with the rise of output per capita when population dropped and the subsequent decline back to the pre-crisis levels as population recovered, by the mid-fifteenth century. Yet, while the process was Malthusian in nature, the overall dynamics differ from the classic Malthusian response. Indeed, after the Black Death, output per capita grew less (c.10 per cent) and for a shorter period than elsewhere on the Continent where the welfare gains averaged 30 per cent and consolidated almost until up to the 1450s.⁵⁶³ The fact that in France there are no signs of large, positive, enduring effects from the Black Death on per capita incomes is the result of the contemporaneous presence of war and disease. Indeed, assuming that the inputs of production are fixed, the classic Malthusian response to a mortality shock is improvement in per capita income for survivors because of the increase of capital and land per person. Yet, war and disorder raised mortality but also brought about wide destruction of the capital stock that depressed output growth. In addition, persistent military conflict destroyed commercial networks and fostered political fragmentation, leading to low levels of market integration. All these factors complicated the standard predictions of the Malthusian model and produced the characteristic ‘dampened’ Malthusian cycle as opposed to the ‘full’ Malthusian cycle experienced by centre-northern Italy. Overall, between the 1350s and the 1550s GDP per capita decreased by about 20 per cent (figure 5).

This phase was followed by a period, stretching from the 1550s to the 1660s, in which output per head soared by about 25 per cent from the minimum of the mid-1500s as output growth more than compensated the sustained expansion of population. This pattern is consistent with the benchmark year estimations of Maddison (2001) and Malanima (2009) (figure 4). The first escape from the stasis coincided in time with the opening of new trade routes to Asia and the Americas and the rise and consolidation of the absolutist state before the advent to the throne of Louis XIV. Yet, over this period other European countries experienced similar or even stronger episodes of growth (Fouquet and Broadberry, 2015). The North Sea Area forged ahead led initially by Holland and then by Britain. Again, the presence of internal (Wars of Religion) other than external conflicts and political turmoil seemingly stunted the process of economic growth in France (Hoffman, 2000).

By the 1660s until the end of the eighteenth century, output per capita remained on a plateau. This protracted phase of stagnation occurred because total production and population grew approximately at the same rate.

⁵⁶³ Spain was an exception.

Figure 4: *GDP per capita (1700=1)*

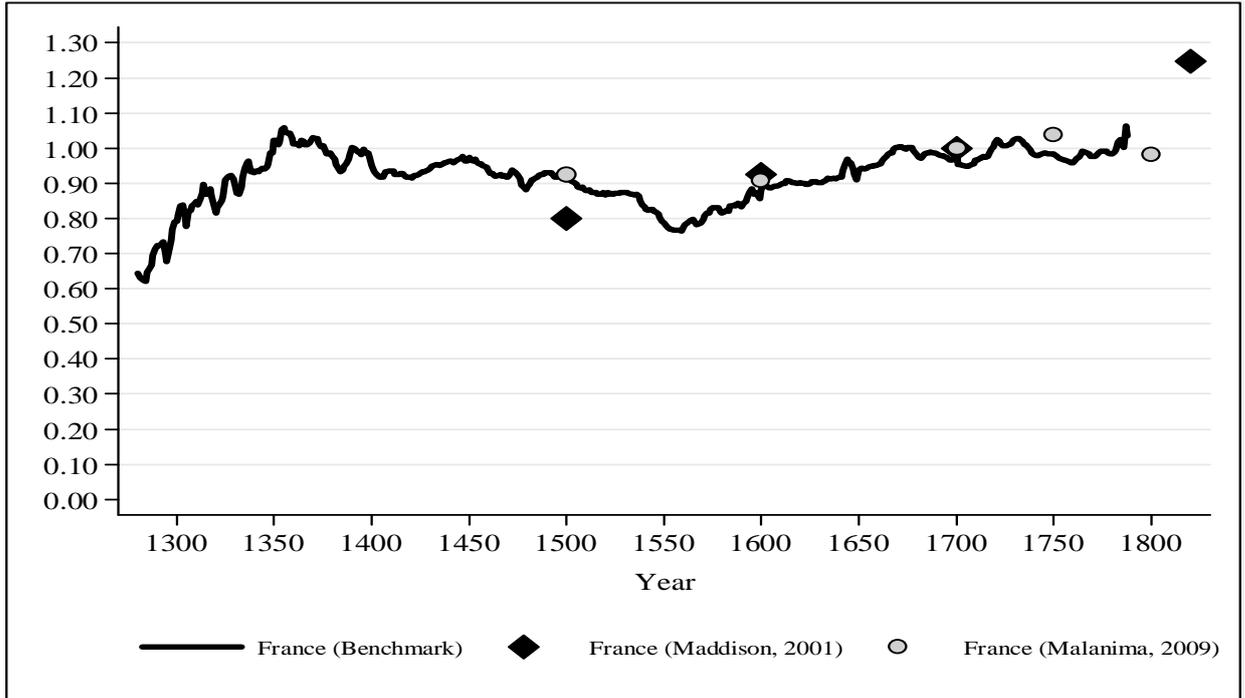
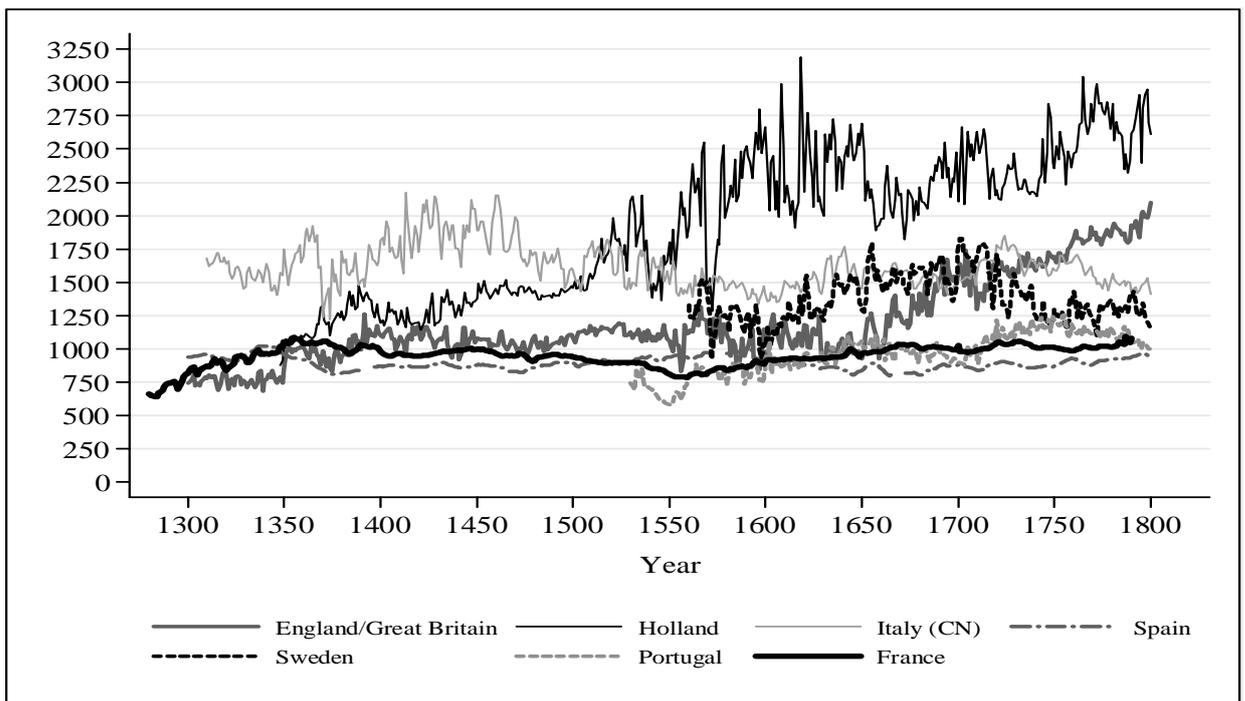


Figure 5: *GDP per capita in Europe (1990 dollars)*



Sources: Fouquet and Broadberry (2015); France, this study.

Table 2: *GDP per capita (Geary-Khamis 1990 dollars)*

<i>Year</i>	England/Great Britain	France	Holland	Italy (CN)	Portugal	Spain	Sweden
1300	757	843		1679		946	
1400	1103	985	1291	1710		863	
1500	1091	935	1459	1616		888	
1600	1068	901	2422	1401	860	961	1140
1700	1546	992	2386	1492	937	867	1619
1790	1876	1045	2556	1495	1100	925	1308

Sources: Fouquet and Broadberry (2015); France, this study. Data are 20-year averages centred on the benchmark year.

Conclusion

Using a new large dataset of prices and wages, this paper reconstructs the first continuous series of output per capita for France from 1280 to 1789. The analysis highlighted three important aspects in the evolution of the largest economy in Western Europe.

First, our series suggests that output per capita was trendless between the 1360s and the 1780s, but rejects the argument that there was no long run improvement in living standards before the industrial revolution. Instead, the evidence demonstrates that GDP per capita rose more than 30 per cent between the 1280s and the 1780s. Yet, most of the rise was explained by a single ‘efflorescence’ of economic growth that took place prior to the Black Death between the 1280s and the 1340s and shifted the trajectory of growth on a higher path.

Second, between the mid-fourteenth century and the end of 1700 output per capita did not exhibit any sustained trend improvement. This result is consistent with the characterization of French economic growth put forward by Le Roy Ladurie (1977) arguing that the pre-industrial French economy was virtually a stagnating, growthless system.

Finally, our estimates suggest that in the debate about the Little Divergence, the evolution of the French economy can be suitably interpreted as an intermediate case between the successful example of the North Sea Area and the declining patterns of Italy and Spain. Being neither a southern country nor a northern one, the growth experience of France seems to reflect this geographic heterogeneity.

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The effect of maize on economic development: Evidence from Romania⁵⁶⁴

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1. Introduction

Authors studying early economic development have observed that the process was associated with a structural transformation of society. As economic growth takes hold, people move from villages to towns and take employment in industry or services leading to a decrease in the share of employment in agriculture (Kuznets, 1957). Understanding the factors that drive this transformation is thus an important aspect of economic development. Classical views (Baumol, 1967) based on experience from England, state that economic development is helped by an increase in agricultural productivity, which frees up labour and increases demand for goods produced by the industrial sector. However, other authors argue that in an open economy, increased agricultural productivity can actually lead to the opposite effect (Mokyr, 1976) increasing the income of the agricultural sector and discouraging workers from moving to cities.

An important historical event that can be exploited to add empirical data to this debate is the widespread transfer of crops, diseases, animals, populations, ideas, technology between the New World and the Old World after Christopher Columbus's voyage to the Americas in 1492 (the Columbian Exchange). Authors have conducted empirical studies in order to assess its impact on economic development nowadays (Nunn, 2014). While many studies argue that the effect of the agricultural productivity shock given by the introduction of new crops from the New World to the Old World on long run development is a positive one (Nunn and Qian, 2011) a number of other studies argue that this is not always the case (Chen and Kung, 2016; Bustos, Caprettini and Ponticelli, 2015). Namely, if the new agricultural technology gives a comparative advantage to agriculture over industry, then it would actually lead to a slowdown in the growth of urbanization. To bring evidence on this, we consider the introduction of maize in Romania at the end of the seventeenth century as a shock to agricultural productivity in order to estimate its effect on economic development as measured by urban population. We hypothesize that, after the introduction of the crop, towns situated in areas that are suitable for maize cultivation had growth rates that were different from towns with low suitability for maize. We expect the effect of maize suitability on urbanization to be negative because the new agricultural technology increased productivity but also required more labour per unit of land creating conditions for an increase in rural population.

Why should we look at the adoption of maize in Romania? One reason is that land conditions are favourable for the cultivation of maize. Thus maize has been the most cultivated cereal in Romania since records began and until today. In fact today, Romania has the largest areas cultivated with maize from the EU so we can expect that the adoption of this crop has had an important effect on the economy. Another reason is that the country offers a very interesting historical setup. While the Romanian territories shared almost the same culture, they had different institutions. While Transylvania was part of Hungary and later the Austro-Hungarian Empire, Wallachia and Moldova were under Ottoman influence. Starting from the seventeenth century they also come occasionally under the influence of the Russian empire, as it was seeking to expand towards the Bosphorus.

⁵⁶⁴ I am particularly grateful to my advisors Peter Sandholt Jensen and Paul Richard Sharp for useful help and suggestions. I would also like to thank James Robinson, Neil Parsons, Christian Skovsgaard, Anne Sofie Beck Knudsen, Peter Egedesø Madsen, Philipp Ager, as well as the participants at the WEast 2016 and DGPE 2016 workshops for useful comments and discussions. All errors are my own.

2. Background and literature

History of maize and its benefits

Columbus introduced maize into Europe in 1493, after his first voyage, when he gave an account of his journey to the court in Barcelona. Over the next century, the new crop gradually spread towards the east. In Romania, maize first reached Transylvania during the seventeenth century. Next it reaches Wallachia between 1678 and 1688, and Moldova by 1693. The story about the introduction of maize to Wallachia says that the export of maize seeds from Transylvania to Wallachia was not allowed. So, in order to get the maize across the border, the Wallachian ruler bought turkeys instead and fed them with corn before crossing the border. Then, as soon as the border was crossed the turkeys were sacrificed and the corn was retrieved.

Being at the meeting point of three empires, wars were very frequent in the period. At the time of the introduction of maize, the preferred strategy of dealing with invading armies was fighting a war of attrition, burning crops and poisoning wells ahead of an advancing enemy. This made millet the preferred choice of crop for farmers because of the very short growing season which takes around 90 days from seed to harvest. In Romania, as in the rest of Europe, maize took over the zones where foxtail millet was grown (Haudricourt and H é din, 1987:223). Within a century, maize had largely replaced millet as the main crop grown in the Romanian territories.

The biggest benefit of maize over the cereals from the old world is the high agricultural output per unit of land which averages double that of wheat. Another benefit is that it gives a large amount of carbohydrates, sugar and fat with a short growing season, compared to other plants. Corn flour has the advantage of better mineral content and better taste than millet flour. This, coupled with the fact that it can be cooked in the same way as millet flour, by boiling it in water, led to the replacement of millet with maize in the ‘polenta’ which is one of the country’s national foods. One disadvantage compared to millet is that the growing season is longer by 30-40 more days but that is still shorter than that of wheat. On the other hand, maize does require more labour input than millet. Another advantage that corn enjoyed was that it was exempt from the Ottoman tribute, unlike wheat. Although in the beginning, both in Moldavia and Wallachia but also in Transylvania, the lords tried to slow down the spread of maize by banning the cultivation of maize on wheat fields. Growing maize was later permitted on the peasant’s fields and it soon mostly replaced other cultures, the only ones that continued to grow wheat being the manors. Thus, in the countryside the main food for the peasants became maize ‘polenta’, which they ate instead of bread.

Literature

The impact of maize cultivation in Romania on economic development is discussed in a series of historical studies (Djuvara, 2002, Lampe 1982). However, no quantitative studies have yet been carried out. International evidence which focuses on maize as a shock to agricultural productivity exists but is scarce. One reason for this is that, unlike in Romania, maize was not an important staple crop in Western Europe, being used mostly as livestock fodder. The impact of other agricultural technologies was more widely analysed. One well known study is that of Joel Mokyr (1981) which examines the influence of potato adoption on population growth in 1845 for Ireland. Expanding the study by Mokyr, Nunn and Qian (2011) examine how potatoes influenced population growth across Europe, after the introduction of potatoes to the Old World. Looking at a different crop, Schmidt, Jensen and Naz (2015) find that the introduction of clover to Denmark accounts for 8 per cent of the market town population growth between 1672 and 1900. A study that analyses the effect of maize adoption is that of Chen and Kung (2016). They find that maize accounted for 19 per cent of the population increase after its introduction in 1776 but find a less pronounced effect on urbanization and real wages. Foster and Rosenzweig (2004, 2008) study the impact of the adoption of high-yielding-varieties of corn, rice, sorghum wheat during the Green Revolution and find that the

higher improvements in crop yields have a negative impact on manufacturing growth in villages across India. A study of interest for our analysis is the one by Bustos, Caprettini and Ponticelli (2015) which provides evidence from Brazil that the introduction of less labour intensive crop like GE soy leads to an increase in industrialization rates while a more labour intensive crop like second harvest season maize has the opposite effect. Their explanation is that when a less labour intensive crop is introduced people move to the cities to search for a new job, while if a more labour intensive crop is introduced, people will have an incentive to remain and work in the countryside.

3. Data

The data on city populations are compiled from multiple sources. The primary sources are the National Archives of Romania, National Library of Romania and Romanian Academy. This set of data is combined with the one from Bairoch (1988) resulting in a total of 1,227 observations for 223 different cities and towns in the period 1200-1920, although the process of data collection for the urban as well as for the rural sector is still in progress. Table 1 shows the number of observations for the three principalities across the periods taken in consideration, accompanied by the average population.

Table 1: *Number of observations across periods and average population for Transylvania, Moldova and Wallachia*

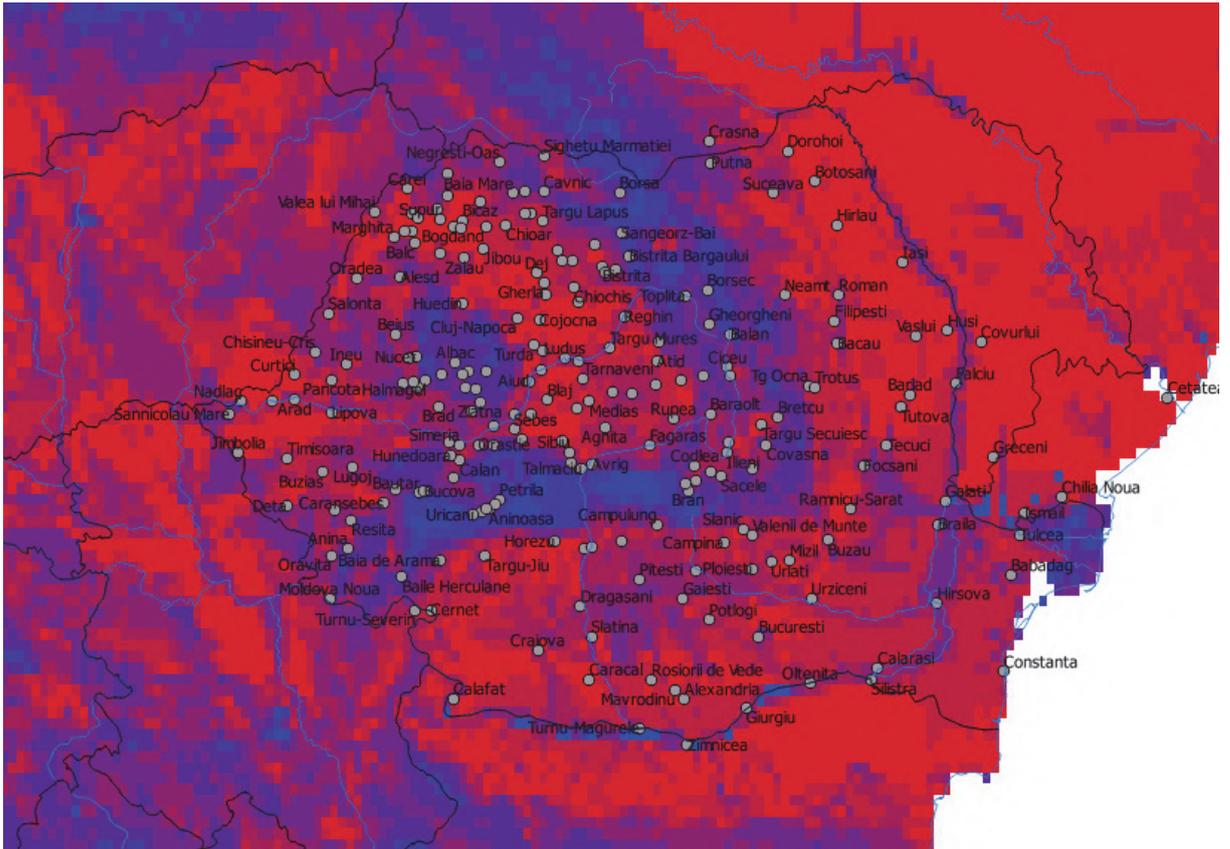
Period	Number of observations			Average population		
	Transylvania	Moldova	Wallachia	Transylvania	Moldova	Wallachia
under 1250	16	2	0	1196	1200	-
1250-1350	6	3	3	1307	1300	1300
1350-1450	3	1	2	1400	1436	1400
1450-1550	23	1	3	1479	1500	1500
1550-1650	34	19	6	1576	1598	1607
1650-1725	29	5	8	1701	1691	1677
1725-1775	30	19	7	1749	1768	1750
1775-1825	47	26	21	1791	1805	1803
1825-1875	367	38	101	1851	1844	1851
over 1875	201	34	38	1892	1915	1917

Source: author's calculations

It can be observed that the best records of city population are available after 1825. More observations could be found in Transylvania perhaps due to a better organized state administration. Average population stays the same because more records of less important towns become available towards the end of the period.

In order to pursue our difference and difference strategy, data on crop suitability were taken from the GAEZ database (Global Agro-Ecological Zones) of the UN Food and Agriculture Organization. This database aims to provide reliable knowledge at a global level about the available agricultural resources in order to help with the sustainable management of these resources. In order to estimate the available agricultural resources, the globe is divided in squares of a resolution of five arc-seconds and for each of these squares, a crop suitability is assigned. The suitability is calculated based on climate, soil and terrain data. Climate data include temperature, precipitation, wind speed, sunshine hours, humidity and we used suitability levels calculated for: rain-fed crops (no irrigation), a low input of labour, technology and climatic data from the 1961-91 base period. Figure 1 displays the suitability for maize and the city distribution across Romania.

Figure 1: Maize suitability and cities. Source: GAEZ database



Areas in red colour are the most suitable for maize cultivation, whereas the blue areas are less suitable, providing variation across the three Romanian Principalities. For each city, crop suitability is taken as average suitability on a 30 km radius around the town. Distance from rivers and distance from the sea were also calculated to be used as a proxy for trade.

4. Empirical strategy

To quantify the effect of the agricultural technology shock, we implement a difference in difference estimation strategy. The objective is to compare the relative differences in the growth of urbanization before and after the introduction of maize between the regions that were suitable for maize and those that were not. On top of that we estimate a flexible model to check when the effects on urbanization start to become statistically significant. The regression equation for the base model is the following:

$$\ln(pop_{it}) = \alpha_r + \alpha_y + maize_{it} \cdot adoption_{1700} \beta + \varepsilon_{it}, \quad [1]$$

where: the independent variable represents the natural logarithm of city population regressed on: fixed effects for region and year; *maize* represents the average maize suitability on a 30 km radius; *adoption* takes the value of 1 after the date of adoption of maize; β measures the impact of maize on city population, and ε is the error term.

We also add controls variable for other crops, distance from rivers, sea, ruggedness, elevation, latitude, and distance from Bucharest and Vienna. Flexible models with interactions for all periods were also estimated so that in the end, further robustness checks could be performed.

5. Results

Table 2 presents the regression results. Column 1 presents the results for the base model. In column 2 different control variables were added. Column 3 controls for different Old World crops while column 4 controls for another New World crop, namely the potato. The model in column 5 controls for the crop being replaced by maize, the millet. All these models show that

maize suitability had a significant effect on the city population, leading to a decrease of between 9 per cent and 20 per cent of city population per suitability class.

To allow for regional differences, column 6 shows that the effect of maize was significantly less pronounced in Moldova than in the other regions, probably because of the longer distance to trade routes (less grain exports).

Table 2: Results for the baseline model

	(1)	(2)	(3)	(4)	(5)	(6)
	log pop.	log pop.	log pop.	log pop.	log pop.	log pop.
maize * adoption	-0.128***	-0.077***	-0.090*	-0.202***	-0.105***	-0.229***
	[-6.133]	[-2.583]	[-1.865]	[-5.132]	[-4.759]	[-8.470]
maize*adoption*Moldova						0.177***
						[2.675]
maize*adoption*Wallachia						-0.046
						[-0.683]
Observations	1227	1227	1227	1227	1227	1227
R-squared	0.332	0.392	0.351	0.345	0.377	0.353
t-statistics in brackets						
*** p<0.01, ** p<0.05, * p<0.1						
Fixed effects for:						
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Distance from river	No	Yes	No	No	No	No
Distance from sea	No	Yes	No	No	No	No
Elevation	No	Yes	No	No	No	No
Ruggedness	No	Yes	No	No	No	No
Latitude	No	Yes	No	No	No	No
Distance from bucharest	No	Yes	No	No	No	No
Wheat suitability	No	No	Yes	No	No	No
Barley suitability	No	No	Yes	No	No	No
Oat suitability	No	No	Yes	No	No	No
Rye suitability	No	No	Yes	No	No	No
Potato suitability	No	No	No	Yes	No	No
Millet suitability	No	No	No	No	Yes	No

Table 3: Results for the flexible model

maize*y1300	maize*y1400	maize*y1500	maize*y1600	maize*y1700	maize*y1750	maize*y1800	maize*y1850	maize*y1900
0.564	0.83	0.29	-0.038	-0.054	0.017	-0.0867	-0.124***	-0.304***
[1.613]	[1.359]	[1.210]	[-0.280]	[-0.312]	[0.129]	[-0.914]	[-4.453]	[-6.972]
Observations	1,227							
R-squared	0.367							
t-statistics in brackets								
*** p<0.01, ** p<0.05, * p<0.1								

F-test for overall significance 33.24***

The flexible model in table 3 shows a significant negative influence of maize suitability on city populations but only starting from 1850. The possible explanations could be that it took time for the adoption of maize to take place and for its effects on population to show, and that the increased trade with grains at the end of the nineteenth century determined more people to stay in the countryside and work the land instead of moving to cities.

6. Conclusion and discussion

The results show that maize had a significant negative effect on urbanization, by observing a decrease of as much as 10 per cent in population per suitability level with the strongest effects shown after 1850, possibly because of improved trade relations in the second half of the nineteenth century. We add empirical evidence to the theory that not all improvements in agriculture lead to increases in urbanization, with more labour intensive agricultural technology giving people a smaller incentive to move to cities.

One way to reconcile the two views on the relationship between agricultural productivity and economic development is to look at the timing and location of the events analysed in the studies arguing for the two sides. Papers bringing evidence that increased agricultural productivity has a positive effect on economic development looked mostly at Western Europe at events further in the past. On the other hand, studies that see the opposite analyse more recent productivity shocks in Eastern Europe or Brazil (for example). Considering this, one explanation could be that when the new crops were introduced in Western Europe, there was less trade because the means of transport (especially over land) were less developed and the leaders of the time pursued a policy of mercantilism, thus the economies worked more like closed economies. When the new crops reached Eastern Europe, trade links were already improving and political views on trade had changed so the economies in these countries were closer to open economies.

For example, maize was introduced in Spain in 1593 but only reached Romania around 1700 and spread in the century to follow. This would mean that while the productivity shock had a positive impact on economic development and urbanization in Western Europe, trade conditions could have changed enough by the time that the technology reached Eastern Europe to actually create a negative impact on urbanization here. This can be one mechanism for explaining the divergence between Eastern and Western Europe. Supporting this idea, we find with our flexible model that the negative effects on urbanization become significant around 1850, when trade was facilitated by the new railways and steam ships. Additionally, the structural difference is even visible today, when around 30 per cent of the population in Romania is employed in agriculture, while that number is around 1 per cent in the UK.

Further work aims to enrich the present dataset, to investigate if maize had a positive effect on the rural population, to look at employment structure, wages, and to improve the model with other specifications and other control variables.

The cost of remoteness revisited

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1. Introduction

In a very influential article, Redding and Sturm (2008) use the German division after World War II (WWII) as a natural experiment to provide causal evidence on the importance of market access for regional development. The authors find that following division 20 West German cities located within 75 kilometres of the East-West German border (treatment cities) experienced a considerable decline in annual population growth relative to other West German cities (control cities). They attribute this growth difference to the decline in market access caused by the division. The key assumption in Redding and Sturm (2008) is that distance to the East-West German border, which determines treatment and control status, affects population growth only through its effect on lost market access.

Redding and Sturm (2008), however, neglect the war related migration of refugees in the 1950s, which provides an alternative explanation for their findings. I show that the treatment effect estimated by Redding and Sturm (2008) is nearly halved when I add the population share of refugees in 1950 to control for the internal migration pattern. Moreover, I correct the annual city-level population growth rates by accounting for all boundary changes between 1950 and 1988. I show that the treatment effect disappears completely when these boundary changes are taken into account.

2. Refugees in West Germany

In 1944, when the defeat of Nazi Germany was just a matter of time, the German authorities ordered the evacuation of ethnic Germans that were living in the eastern territories of the German Reich. However, the rapid advances of the Soviet troops and the fear of acts of revenge led to an unorganized mass flight of German population to the West. After the unconditional surrender of Nazi Germany on 8 May, 1945, the eastern territories of the German Reich were ceded to Poland and Russia (see figure 1). However, even after the unconditional surrender the forceful displacement of ethnic Germans, especially from Polish and Czechoslovakian territories, continued. These *wild* expulsions were followed by organized and compulsory transfers that were sanctioned by the Potsdam Agreement in August 1945.

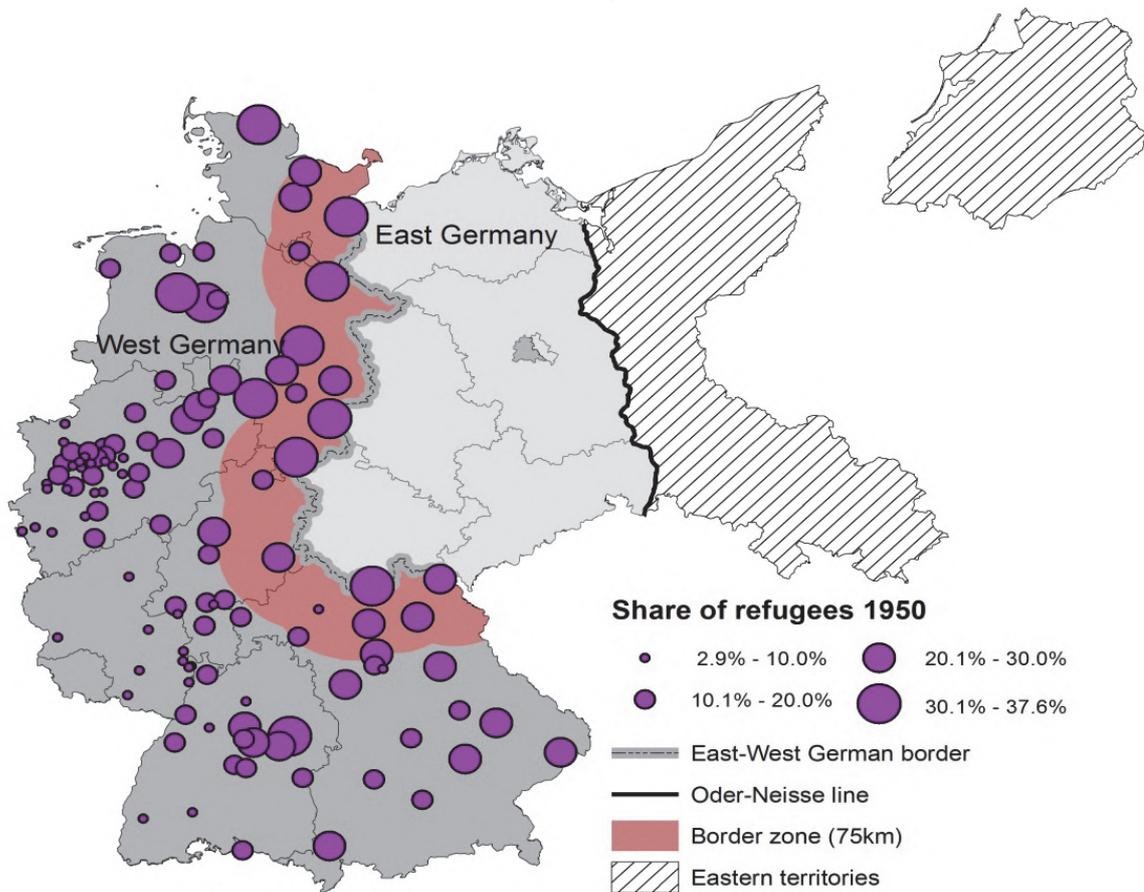
According to the 1950 census, there were about 9.5 million refugees living in West Germany. Refugees are defined as all ethnic Germans who on 1 September, 1939 lived in the former German territories east of the Oder-Neisse line, the Soviet occupation zone, Berlin or the Saarland. In addition, ethnic Germans from abroad with German as their mother tongue are defined as refugees. These refugees made up a fifth of the West German population in 1950 (Statistisches Bundesamt, 1955).

The 9.5 million refugees, however, were not equally distributed over West Germany. Most refugees fled to the nearest western territories not threatened by the Red Army. Moreover, the organized transports according to the Potsdam Agreement brought refugees to reception points in the east of each receiving occupation zone (Douglas, 2012). Finally, the French zone in the south west of Germany refused to admit any refugees. Overall, therefore, refugees were concentrated close to the later East-West German border (Wild, 1979).

Several attempts by the authorities to rebalance the regional distribution of refugees between 1947 and 1949 failed. Refugees that tried to relocate on their own were hindered by several restrictions imposed by the Allied Occupation Forces (Mueller and Simon, 1959; Connor, 2007). Although the restrictions were relaxed by 1949, the unorganized movement of

refugees remained at a minor scale until 1950. Thus, the unequal distribution of refugees was highly persistent and could be observed even five years after the war.

Figure 1: *The German Reich in its 1937 borders and the distribution of refugees in sample cities in 1950*



Sources: Deutscher Städtetag (1952, 1953), own calculations. Author's design.

Figure 1 depicts the share of refugees in total population in 1950 for all 119 West German sample cities. Moreover, figure 1 displays East Germany (the former Soviet occupation zone), the Oder-Neisse line, which was set as the new eastern border of Germany, and the eastern territories of the German Reich that became part of Poland and Russia after WWII. The treatment cities (cities lying within 75 kilometres of the East-West German border) had on average higher shares of refugees (25 per cent) than more western cities (14 per cent) in 1950.

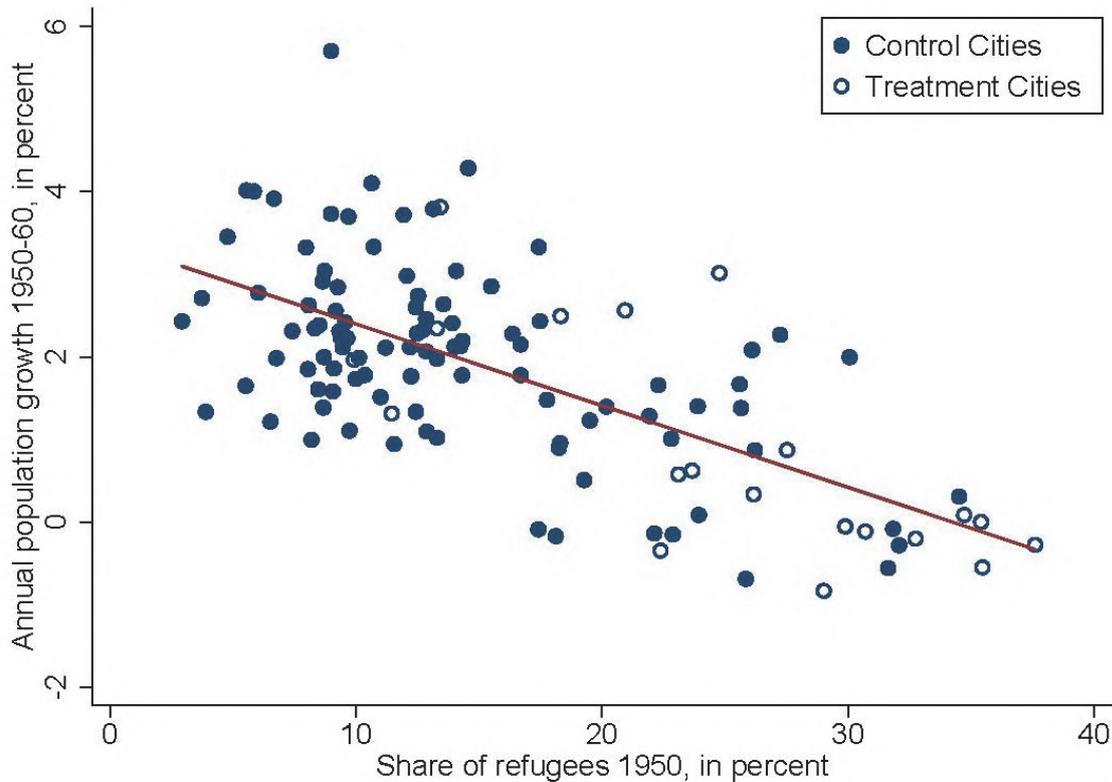
Free movement was fully restored finally on 23 May 1949 when the Federal Republic of Germany was founded. In 1949, however, the housing stock of the cities was not rebuilt and the influx of population into the cities, thus, picked up slowly (Wild, 1979). Additionally, the government began to organize population transfers at the end of 1949. By the end of June 1958 about 918,000 refugees had been relocated by official programmes (Mueller and Simon, 1959). The total amount of internal migration was considerably larger, since additional refugees moved on their own.

These movements changed the structure of city population in the 1950s substantially. First, refugees left the rural areas they had initially arrived at and migrated to cities. Consequently, the overall population share of refugees in the sample cities increased from 16 per cent in 1950 to 22 per cent in 1961.⁵⁶⁵ Second, their movement to the West reduced differences in the shares of refugees between treatment and control cities. In 1961, the

⁵⁶⁵ Between 1950 and 1961 another 3 million refugees from East Germany reached West Germany and located predominantly in cities (Statistisches Bundesamt, 1967). Thus, these new refugees increased the average population share of refugees additionally.

treatment cities had an average refugee share of 26 per cent while control cities had reached 21 per cent. Due to the relocation of the refugees, the difference between treatment and control cities in the population share of refugees more than halved between 1950 and 1961 from 11 to 5 percentage points.

Figure 2: Annual population growth 1950-60 and refugee share in 1950



Sources: Deutscher Städtetag (1952, 1953) and Redding and Sturm (2008), own calculations.

Figure 2 illustrates the negative correlation of annual population growth of the sample cities in the 1950s with the population share of refugees in 1950. The 20 treatment cities are highlighted by circles to show their clustering at the south-east, i.e., having high shares of refugees and low population growth in the 1950s. The unconditional OLS regression line in figure 2 suggests that an increase of the 1950 refugee share of one percentage point is associated with a decrease in the annual population growth between 1950 and 1960 by 0.1 percentage points. This simple regression provides some preliminary evidence that at least a part of the growth differences between treatment and control cities may be driven by the relocation of refugees.

3. Estimation and discussion

For the empirical analysis I have recourse to the dataset provided by Redding and Sturm (2008) and add data on population and refugees in 1950 provided by Deutscher Städtetag (1952, 1953). The estimation strategy follows Redding and Sturm (2008) and uses a differences-in-differences model to estimate the treatment effect, i.e., the effect of division on the annual population growth of 20 West German cities within 75 kilometres to the East-West German border compared to 99 more western German cities. The underlying argument is that cities close to the border (treatment cities) lost substantial part of their market access while more western cities (control cities) were less affected.

This estimation strategy is prone to contemporaneous shocks that affect treatment and control cities at a different scale. Thus, it is important to control for the inflow of refugees during and after WWII into West German cities. Redding and Sturm (2008) control for the

population share of refugees in 1961. On the one hand, this measure allows the authors to include the 3 million refugees which arrived from East Germany between 1950 and 1961. On the other hand, it neglects the migration pattern in the 1950s, because regional distribution of refugees was widely rebalanced in 1961. Thus, I include the population share of refugees in 1950 as a control variable to account for this contemporaneous shock on city population. An important feature of this control variable is that it was predetermined at the time of division, because most refugees arrived until 1946 and were hindered to relocate in the aftermath of WWII.⁵⁶⁶

3.1 Controlling for internal migration in the 1950s

In a first step I reproduce the estimation results reported in table 5 in Redding and Sturm (2008, p.1790) and additionally conduct the same estimation but with the 1950 population share of refugees as a control. The underlying estimation equation is as follows:

$$Popgrowth_{ct} = \alpha + \beta Border_c + \gamma (Border_c \times Division_t) + \delta_t (Refugees_{ic} \times d_t) + d_t + \varepsilon_{ct} \quad [1]$$

where $Popgrowth_{ct}$ is the annualized population growth rate in city c for the periods $t = 1919-25, 1925-33, 1933-39, 1950-60, 1960-70, 1970-80,$ and $1980-88$. $Border_c$ is a binary dummy variable that is one for all cities lying within 75 kilometres to the East-West German border and zero otherwise, $Division_t$ is a dummy that is one for the postwar periods, d_t is a full set of time fixed effects, and ε_t is an error term, clustered at the city level. Finally, the share of $Refugees_{ic}$ in total population in year $i = 1950, 1961$ of each city is interacted with period dummies.

Table 1 presents the results in the first two columns. Column 1 contains the original results of Redding and Sturm (2008) with the refugee share in 1961 as a control. The estimated treatment effect is -0.678 and is statistically significant at the one per cent level. This estimate is virtually unchanged compared to their baseline model result that does not control for refugees (-0.746, s.e. 0.182). Consequently, the authors conclude that the overall treatment effect cannot be explained by refugees.

Column 2 shows the results of the same estimation but includes the 1950 population share of refugees. Now the estimated treatment effect is almost halved (-0.387) and not statistically significant at any standard level. Moreover, the explanatory power of the econometric model increases markedly. Interaction terms imply that a one percentage point increase of the refugee share in 1950 reduces annual population growth in the 1950s by 0.089 percentage points. In 1950, the population share of refugees in treatment cities was on average 11 percentage points above control cities. The average annual population growth rate in the 1950s is 0.88 per cent for treatment and 2.00 per cent for control cities. Thus, the internal migration of refugees in the 1950s explains a substantial part of the different development of treatment and control cities ($0.089 \times 11 = 0.979$).

Finally, I analyse the dynamics of growth adjustment. For the estimation, I replace the term $(Border_c \times Division_t)$ in equation [1] by $(Border_c \times Division_t \times d_t)$. Hence, the border dummy is interacted with each postwar period separately. I present the results in columns 3 and 4. According to the results in column 4, the division had no immediate impact on treatment cities. Hence, the relocation of refugees can fully explain the large growth differences between treatment and control group in the 1950s and 1960s. The only statistically significant estimate for treatment cities is found for the 1970s with -1.122. This growth difference between treatment and control cities in the 1970s drives the total treatment effect in column 2.

⁵⁶⁶ However, some refugees might have endogenously chosen their initial residence or relocated according to city characteristics. I assess this potential endogeneity problem in the Appendix of the original paper. The robustness checks indicate that endogenous location choice of refugees should be a minor problem, if at all.

3.2 Adjusting for boundary changes

Sample cities experienced numerous boundary changes during the investigation period, especially in the 1970s. Although Redding and Sturm (2008, Technical Appendix, p.8) “aggregate any settlement with a population greater than 10,000 in 1919 that merges with one of [their] cities for all years in the sample”, they do not adjust the population growth rate for smaller boundary changes. Thus, the estimated treatment effect for the 1970s might be a statistical artefact of these smaller boundary changes, where municipalities with less than 10,000 inhabitants in 1919 are incorporated into sample cities. Therefore, I correct the annual population growth rate for all population changes that were induced by boundary changes between 1950 and 1988. There are 155 of these smaller boundary changes in the sample cities, 93 of them in the 1970s.

Table 1: Population growth – controlling for internal migration

	Population growth			
	(1)	(2)	(3)	(4)
Border _c × Division _t	-0.678*** (0.211)	-0.387 (0.261)		
Border _c × 1950-60			-1.249*** (0.348)	0.019 (0.351)
Border _c × 1960-70			-0.699** (0.283)	-0.259 (0.315)
Border _c × 1970-80			-0.640** (0.355)	-1.122** (0.472)
Border _c × 1980-88			-0.397** (0.147)	-0.187 (0.198)
Refugees _{ic} × 1919-25	0.004 (0.020)	0.000 (0.020)		0.000 (0.020)
Refugees _{ic} × 1925-33	-0.014 (0.014)	-0.018 (0.014)		-0.018 (0.014)
Refugees _{ic} × 1933-39	0.068*** (0.022)	0.072*** (0.017)		0.072*** (0.017)
Refugees _{ic} × 1950-60	-0.052*** (0.014)	-0.089*** (0.010)		-0.098*** (0.011)
Refugees _{ic} × 1960-70	-0.002 (0.016)	-0.019 (0.012)		-0.022* (0.012)
Refugees _{ic} × 1970-80	0.065*** (0.024)	0.046** (0.018)		0.062*** (0.020)
Refugees _{ic} × 1980-88	0.013* (0.007)	0.003 (0.006)		-0.001 (0.005)
Border _c	0.029 (0.167)	-0.067 (0.213)	0.129 (0.139)	-0.067 (0.213)
Year FE	Yes	Yes	Yes	Yes
i	1961	1950	–	1950
Observations	833	833	833	833
R-squared	0.243	0.281	0.214	0.286

Notes: Standard errors in parentheses are adjusted for clustering on cities.
 ***, **, * = Significant at the 1, 5, and 10 percent level.

Column 1 of table 2 shows the original baseline differences-in-differences results of Redding and Sturm (2008), without adjusting for smaller boundary changes. Controlling for all boundary changes in column 2 almost doubles the R-squared and reduces the estimated treatment effect from -0.746 to -0.631.

Columns 3 to 6 present the same results as in table 1 but for the adjusted population growth rate as dependent variable. There are three main differences in the estimation results compared to table 1. First, the explanatory power increases in all four specifications. Second, the absolute treatment effect decreases. Finally, the interaction term of the treatment dummy with 1970-80 in columns 5 and 6 is lower in absolute terms.

These results indicate that the boundary changes increase the measurement error in the dependent variable and bias the treatment effect upwards. Furthermore, boundary changes in the 1970s can explain the large growth differences between treatment and control cities in this period. Most importantly, controlling for the refugee share in 1950 and adjusting for boundary changes reduces the baseline treatment effect from -0.746 in column 1 to -0.145 in column 4. Thus, there is no statistically significant growth difference between treatment and control cities once the internal migration of refugees and smaller boundary changes are taken into account.

Table 2: *Population growth – adjusting for boundary changes*

	Population growth					
	(1)	(2)	(3)	(4)	(5)	(6)
Border _c × Division _t	-0.746*** (0.182)	-0.623*** (0.170)	-0.483** (0.192)	-0.145 (0.217)		
Border _c × 1950-60					-1.244*** (0.348)	0.058 (0.342)
Border _c × 1960-70					-0.572*** (0.188)	-0.206 (0.227)
Border _c × 1970-80					-0.278 (0.192)	-0.246 (0.253)
Border _c × 1980-88					-0.397*** (0.147)	-0.186 (0.199)
Refugees _{ic} × 1919-25			0.004 (0.020)	0.000 (0.020)		0.000 (0.020)
Refugees _{ic} × 1925-33			-0.014 (0.014)	-0.018 (0.014)		-0.018 (0.014)
Refugees _{ic} × 1933-39			0.068*** (0.022)	0.072*** (0.017)		0.072*** (0.017)
Refugees _{ic} × 1950-60			-0.059*** (0.014)	-0.096*** (0.009)		-0.101*** (0.011)
Refugees _{ic} × 1960-70			-0.000 (0.010)	-0.017** (0.008)		-0.016* (0.008)
Refugees _{ic} × 1970-80			0.019** (0.008)	0.013* (0.007)		0.015** (0.007)
Refugees _{ic} × 1980-88			0.010 (0.007)	-0.002 (0.006)		-0.001 (0.005)
Border _c	0.129 (0.139)	0.129 (0.139)	0.029 (0.167)	-0.067 (0.213)	0.129 (0.139)	-0.067 (0.213)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
i	–	–	1961	1950	–	1950
Boundary changes	No	Yes	Yes	Yes	Yes	Yes
Observations	833	833	833	833	833	833
R-squared	0.211	0.379	0.406	0.455	0.385	0.455

Notes: Standard errors in parentheses are adjusted for clustering on cities.
 ***, **, * = Significant at the 1, 5, and 10 percent level.

4. Conclusion

The empirical results provide strong evidence that the treatment effect estimated by Redding and Sturm (2008) primarily captures a contemporaneous shock in refugee share, rather than a shock in market access. There is no statistically significant treatment effect when I take this contemporaneous shock into account. Moreover, when I adjust the population growth rate for smaller boundary changes the difference between treatment and control cities disappears completely.

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New Researcher Posters

Colonial technology, human capital and African development: The case of Italian Libya
Mattia Bertazzini (London School of Economics)

Foreigners in the British Navy, 1793-1815: Some initial notes towards a quantitative analysis, and its limitations
Sara Caputo (University of Cambridge)

Manorial officeholding in late medieval and early modern England, 1300-1600
Spike Gibbs (University of Cambridge)

From Cornish pilchards to Newfoundland cod: The expansion of commercial fisheries in south-west England, 1550-1650
Joshua Ivinson (University of Cambridge)

Municipality-level inequality in Sweden 1871 and 1892
Sara Moricz (Lund University)

The impact of political disturbances into stock returns: Evidence from the Boulangiste campaign
Miguel Ángel Ortiz Serrano (Sciences Po)

Mapping agglomeration and trade in early mainland Southeast Asia
Phacharaphorn Phanomvan na Ayudhya (University of Oxford)

The Colombian National Railway Company: Political stability and company profitability; a case study
Andrew Primmer (University of Bristol)

Agglomeration forces in Sweden since 1800
Julius Probst (Lund University)

The functionality of imprisonment for debt in the eighteenth century: the evidence from the registers of the Woodstreet Compter, 1740-1800
Alexander Wakelam (University of Cambridge)

Financial frictions in trade: Evidence from the 1866 Banking Crisis
Chenzi Xu (Harvard University)



Abstracts of Academic Papers

I/A Nineteenth-Century Banking

Nuno Palma (University of Groningen) & **Patrick O'Brien** (London School of Economics)

Danger to the old lady of Threadneedle Street? The Bank Restriction Act and the regime shift to paper money, 1797-1821

The Bank Restriction Act of 1797 made legal the Bank of England's suspension of the convertibility of its banknotes. The current historical consensus is that it resulted from the state's need to finance the war, France's remonetization, a loss of confidence in the English country banks, and the run on the Bank of England's reserves. We argue that while these factors help us understand the timing of the Restriction period, they cannot explain its success. We deploy new long-term data which leads us to a complementary explanation: the policy succeeded thanks to the reputation of the Bank of England, achieved through a century of monetary stability.

Aaron Graham (University College London)

Paper money in Jamaica and the Bullionist Controversy, 1800-45

This paper examines the reception of economic thought in the British Empire in the early nineteenth century, by showing how the creation of paper money in Jamaica was informed by the Bullionist Controversy in Britain. The doctrine that paper notes should be backed by bullion had become financial orthodoxy in Britain by the mid-nineteenth century, culminating in the Bank Charter Act of 1844, which entrenched a system of banking based on convertibility. Imperial banks based in London, such as the Colonial Bank, were expected to conform themselves to it. However, my paper demonstrates that elites in Jamaica were fully aware of these debates but merchants and bankers paid only lip service to Bullionist thought. They embraced instead a version of the 'real bills doctrine' that encouraged them to emit large amounts of paper money on the security of the government of Jamaica and its powers of taxation, either directly or through banks that emitted paper money secured against its holdings of government debt. This enabled elites in Jamaica to address successfully a serious shortage of specie in the 1820s and 1830s, and the calamitous economic and social effects that would have resulted, by issuing over £500,000 in paper money, equivalent to ten per cent of the gross domestic product.

Bullionist thought could therefore only gain traction as circumstances changed. The intrusion of the Colonial Bank into the West Indies after 1836 created a new political interest which pushed the imperial government to reform the coinage and clamp down on note emissions. The abolition of slavery and the reconstruction of the plantation economy within the West Indies reflected a shift in the balance of power between the colonies and metropole, which allowed these financial changes to take place, but also contributed to a crisis of confidence that undermined the credibility of the assembly as a financial actor, and the government debt that it issued. The result was a bank run in July 1838 that empowered Bullionist writers and politicians in Jamaica, leading to a shift in the local regulatory regime. The paper money was called in and destroyed, and the imperial system of banking regulation was adopted, despite the squeeze this imposed on the money supply in the colony. The reception of economic thought in the colonial periphery was therefore a complex process. Local elites did not adopt metropolitan thought wholesale, but adapted it to local conditions, and as this conditions changed, the reception of economic thought shifted with them.

Andrew Odlyzko (University of Minnesota)

The London Stock Exchange and the British shadow banking system

Because of its important role in the development of modern capitalism, the London Stock Exchange (LSE) has been covered by an extensive literature. Unfortunately, recent scholarly coverage either omits entirely or presents a distorted picture of some very important aspects of LSE's role and operations.

Almost all descriptions of the LSE focus on its role in providing a market for long-term investments. As it turns out, the LSE was also a key element of the British shadow banking system. It may even have been the key element, since the rapid changes in interest rates and variations in rates for borrowing on different securities, as well as contemporary comments, suggest that this is where the various financial flows were equilibrated.

This novel picture of the LSE is based primarily on two sources. One is the 1842 Blue Book, the Exchequer Bills Forgery Commission report. It appears to have been essentially totally neglected by modern scholars. Yet it is an invaluable source of detailed (although mostly qualitative) information about LSE's involvement in the shadow banking system. The other source is the stock ledgers in the Bank of England (BoE) Archive, which record all transactions in gilts. It is possible to identify many of those transactions as coming from loans that use the respective gilts as collateral. (Additional data has been obtained from other sources, such as the archives of the Hoare bank.) This provides quantitative estimates for the volume of shadow banking operations, and for their connections with the bread and butter operations of the LSE.

The research for this paper is based primarily on data for the 1840s. It is hoped that this work will stimulate further research on other periods, and with other sources of data. What has been found so far suffices to show that the picture that modern scholarly literature presents on the operations of the LSE, BoE, and the entire British banking system is seriously incomplete.

Note: This paper is an offshoot of the research presented in 2016 at the EHS Cambridge conference. The submission for that conference was also about the London Stock Exchange, but had a more limited and more technical scope. However, in the preparation of the paper for that meeting, some of the results mentioned above turned up. A few were mentioned at the Cambridge lecture. The paper prepared for that conference was revised two months afterwards to incorporate additional research done in the meantime, and is available at: <http://ssrn.com/abstract=2787154>

That report contains extensive references that substantiate the claims made above. This submission is based on that manuscript as well as new research that has been done since and is still ongoing. The data from BoE ledgers used there is publicly available on the author's home page, and additional sets, needed for this submission, are being digitized and will similarly be made available.

I/B The Economy of Intoxicants in Early Modern England

James Brown (University of Sheffield)

Alehouse licensing in early modern England reconsidered

Alehouse licensing, instituted by statute in 1552 (5/6 Edward VI c25), was the main instrument by which early modern England's extensive network of alehouses was regulated. It represents one of the most complex and ambitious programmes of economic and social regulation in the period, and the tensions it engendered in local communities have long been recognized as 'one of the most significant social dramas of the age'. However, while we know now a great deal about the preoccupations and progress of statutes, proclamations, and other central government legislation, we know far less about the nuts and bolts of licensing on the ground, or indeed about the social and economic status of licensed alehouse-keepers. In order to remedy this oversight, this paper draws on systematic analysis of around 10,000 surviving alehouse recognizances from Norwich, Chester, and Manchester. It explores the changing numbers of licensed alehouses in each urban centre over time, examines parish distribution, uses the names and occupational descriptions on recognizances to sketch a gender and socio-economic profile of authorized retailers, and uses around 20,000 sureties to explore the broader social networks of the alehouse-keeping fraternity.

Tim Wales (University of Sheffield)

The economy of drink in a small English town

This paper explores the political economy of a small town at once dependent on the victualling trades for its prosperity and faced with significant problems of poverty and order that, for some inhabitants at least, were exacerbated by the drinks economy. The town in question is early modern Thetford, a market town in the southwest corner of Norfolk with a population in the 1660s and 1670s of some 1,200 inhabitants. Without a significant industry or manufacturing base the service trades were essential to Thetford's prosperity. This was all the more so because of its local role as an assize town, its importance as a hub in the East Anglian road system, and through its proximity to local 'elite' recreations (including hunting and horse-racing). Yet despite the economic importance of victualing, in the 1630s the average number of alehouse licenses granted each year almost halved and a similar cull took place in 1656. The density of recordkeeping in Thetford allows the tensions suggested by these trends – between the economic importance of drinking on the one hand and issues of poverty and social order on the other hand – to be comprehensively explored. As importantly, it brings into focus a particular kind of small-town urbanism often ignored by urban and rural historians alike.

Phil Withington (University of Sheffield)

Where was the coffee in early modern England?

Recent accounts of the introduction of coffee into early modern England have stressed the rapid and profound impact of the commodity on the social mores and political culture of men and women of all classes. Drawing on the evidence of port books, inventories, court depositions, and printed materials this paper argues that for all the contemporary discussion of coffee after 1650 there is scant evidence that it was available to be consumed before the end of the seventeenth century; more, that while coffee-houses may well have been a new and important fixture in the urban environment, it is by no means clear that it was coffee that was consumed inside them. The second section of the paper then turns to the better studied example of tobacco to argue that for the era's two most important 'new' intoxicants, the cultural resonances and meanings of each were established long before the vast majority of people had access to the commodities themselves. In so doing the paper makes both a conceptual and historiographical intervention. Conceptually, it suggests that notions of 'social practice' as developed by theorists like Theodore Schatzki – which enable us to consider the

materials of practice alongside their historical meanings and symbolism – offer the most effective way of understanding the complex nature of consumer behaviour in the early modern or indeed any era. Historiographically, it suggests that in processes of commodity innovation and assimilation the marketing of that commodity, and the establishment of cultural norms around it, often precede and shape its consumption in practice.

I/C Industry and Enterprise in the Nineteenth Century

Karolina Hutková (Institute of Historical Research / London School of Economics)

Bengal silk industry and laissez-faire policies in the nineteenth century: Deindustrialization revisited

The English East India Company (EEIC) considered Bengal raw silk to be an item with potential high returns. It therefore decided to adopt innovative silk technologies with the aim of substituting the importation of raw silk from Italy, Turkey and the Mediterranean region. In the period 1760s-1810s the Company invested almost £1 million in transferring European technologies, building filatures and adapting the technology to the climate. The result of this investment was a considerable increase in the share of Bengal raw silk on the total imports of raw silk to Britain – from 8.7 per cent in 1750s-60s to almost 40 per cent in 1770s-1820s. Although, the Company was unable to standardize the quality of Bengal raw silk which negatively impacted the silk prices on the British market, returns to investment analysis shows that the venture was profitable. This is supported by the Company's statistics according to which in 1830s through its capacity to produce raw silk 1 begah of mulberry land created a profit of 34 Rupees and 4 Annas.⁵⁶⁷

The Company was not the only manufacturer of raw silk in Bengal, raw silk was produced by Bengalis and by private entrepreneurs. In 1833, through the new EEIC Charter, the British government stopped the Company's direct involvement in economic activity in India. The Charter was based not on economic analysis but mirrored contemporary British political economy and coincided with a shift from mercantilism to laissez-faire policies. It relied on the assumption that private entrepreneurs would be able to carry out economic activities more efficiently than the Company. In compliance with the new Charter, the EEIC had to sell its silk factories to private entrepreneurs. As a result the quantity of Bengal raw silk imports to the British market declined to 6 per cent of total exports by 1858.

My paper argues that the key reason for the sharp decline in the quantity of silk exported to Britain was the change in the organization of the silk industry in Bengal. The changes to the business model of silk production in Bengal after the switch to laissez-faire policies had implications for the choice of technologies, labour organization and the management of raw silk production. During the period of 1760s-1830s the Company developed a value chain in raw silk manufacturing and integrated cocoon procurement, reeling, warehousing and transport, advertising and the organization of sale among its business activities. The EEIC relied on economies of scale which gave it an advantage. Moreover, thanks to learning-by-doing the Company also developed an expertise in silk manufacturing. This expertise built on the adoption of 'best practices', on acquiring new knowledge through sending silk experts to Bengal, and on granting patents for innovations of the silk technologies.

In comparison to the EEIC, private entrepreneurs had little access to specialized knowledge and skills, and could not take advantage of economies of scale. In most of the 1760s-1830s period private entrepreneurs produced raw silk in Bengal alongside the Company and relied on the EEIC for warehousing facilities, transportation, and sold their silk on the Company's sales. Moreover, the EEIC offered the private filatures free consultation on best practices. In spite of the advantage the private entrepreneurs gained thanks to the Company, the silk they produced never achieved prices as high as the Company's silk. In the period 1829-32 the price of the silk from private filatures was on average 19 per cent lower than the Company's. Private manufacturers never expressed huge interest in raw silk production as only 17 per cent of Bengal raw silk imported to Britain in the period 1829-32

⁵⁶⁷ LSE Archives, W7204, East India Company, *Reports and Documents Connected with the Proceedings of the East-India Company in regard to the Culture and Manufacture of Cotton-wool, Raw Silk, and Indigo in India* (London: J.L. Cox, 1836), p.171.

was produced in private filatures. Evidence shows that private entrepreneurs themselves did not champion the withdrawal of the EEIC from raw silk manufacturing. Silk manufacturer Joseph Grout argued in a hearing in front of the Select Committee on Silk Trade – a Parliamentary committee enquiring into silk manufacturing and trade – that the price for which he was buying the EEIC’s Bengal raw silk was 6 per cent lower than the cost of producing raw silk in Bengal on his own.⁵⁶⁸ Grout also pointed out that the high chances of dying due to the epidemiological and climatic conditions in India decreased the interest in doing business there. The points made by Grout explain why the EEIC was unable to sell the filatures in public auctions and by 1835 ‘the greater part of them still remained in the Company’s hands’.⁵⁶⁹

The evidence presented by Grout and other manufactures show that private entrepreneurs struggled to make profit and often found the venture into Bengal raw silk manufacturing unprofitable. The data for 1829-32 – a period immediately preceding the sale of the Company’s filatures – indicates little interest on the part of private manufacturers and also lack of capabilities to produce raw silk in Bengal profitably. It is apparent that the Government’s decision to bar the EEIC from involvement in manufacturing and trade in Asia was guided by the switch from mercantilism to *laissez-faire* policies. Economic analysis of the impacts of sudden changes to established business models on Indian manufacturing were not considered. For instance, the long-term impacts on the Bengal silk industry were seriously damaging. Since private entrepreneurs did not find raw silk production profitable, they did not/could not invest in innovative technologies. This constituted the chief obstacle for future development of the Bengal silk industry as at a time when silk industries in Europe and Japan were going through revolutionary technological changes – use of steam in reeling, microscopes in sericulture etc. – Bengal silk industry was stagnating. Thus, over the nineteenth century raw silk production for export to the European markets became technologically backward and unprofitable and declined to trivial figures.

Miquel Gutiérrez-Poch (University of Barcelona)

British papermaking engineering, its growth and the origins of its decline, 1800-1939: a comparative approach

British industrial and economic pre-eminence during the industrial revolution was clear. In these “Glorious Times”, the United Kingdom was world’s leader in technological matters. However, this leadership was really over in the late nineteenth century. The falling behind process has a complex explanation with multiple factors to be accounted: economic and business structure of the British economy, markets, education, etc., being the origin of a controversy. British papermaking engineering is a good example of this pattern. British workshops were the main suppliers of paper machines in world markets during an important part of the nineteenth century.

The first continuous papermaking machine is dated to 1798. It was built by the Frenchman Nicolas Louis Robert. The machine was patented for 15 years on 18th January 1799. The new device built was of great mechanical simplicity. The political instability in Revolutionary France made difficult the technological development of Robert’s idea. The most convenient frame to its improvement was in the United Kingdom, where Bryan Donkin built the first machine with “commercial” use in 1804. The new mechanical device was offered to the market for the first time in 1806. Four years later, Donkin had already assembled 16 machines. The business only began to be relevant from the early 1820s onwards. At that time the drying, glazing, and cutting sections were added, making the machine complete. Economic expectations increased dramatically. Donkin had already built 133 machines in 1843 and 179 in 1848. From 1823 to 1848, it had built 142 machines, with a yearly average of seven machines. Donkin’s works achieved 221 machines in 1862. From then onwards, growth slowed down, reaching 231

⁵⁶⁸ House of Commons, Report from Select Committee on the Silk Trade (London: n.p., 1832), pp.697-98.

⁵⁶⁹ LSE Archives, W7204, Reports and Documents, p.xliii.

in 1872. The first to emulate Donkin were other British workshops. The main examples are “Tidcombe” from Watford; “George and William Bertram” and “James Bertram and Son” both from Edinburgh; “Redfern, Bentley & Smith” and “Charles Walmsley & Co, Ltd.”, both from Bury (Lancashire). Scottish, Lancashire and London area workshops took advantage of belonging to papermaking districts.

The British workshops had an important demand in the national market. There were 42 machines working in 1822 in the United Kingdom but 380 in 1851. A very important part of this growth was located in three previously referenced papermaking districts. This growth of modern papermaking gave British works a privileged frame to develop economies of scale, adding a comparative advantage to their pioneering condition in the new technology. These workshops were leaders in the papermaking machines market at least until the 1860s. Donkin’s workshop itself is a good example. The analysis of the complete list of machines built by Donkin from 1804 to 1873 proved that the British market amounted only to 36.9 per cent of the total number of machines. Only France (15.5 per cent) and Germany (20.4 per cent) come to as much in the domestic market.

The export of machines (especially from Donkin), the emigration of skilled workers and the licensing system allowed the setting-up of new papermaking engineering centres. France, Germany, Switzerland and Belgium began to become important in the early 1840s. Other countries such as Norway and Sweden began to have a modest mechanical sector specialized in papermaking from the mid-nineteenth century onwards. These workshops had bigger possibilities of building machines according to local needs. Especially important was the French development. The most important French works were located in Paris (Chapelle, Sandford and Warrall), Mulhouse (Biesler frères & Dixon and Koechlin) and Angouleme (Alfred Motteau). In Belgium, the workshops were more linked with steam and textile engineering, with the exception of Dautrebande, located in Huy (the main Belgian papermaking city). The real alternatives for British machines came from Switzerland, Germany, and the United States. The Swiss Escher Wyss had its origins in a licence by Donkin in the early nineteenth century and reached 104 machines in 1875. Germany had already developed quite an important papermaking engineering industry in 1840. In the United States, the growth of the market created an active industry in papermaking engineering (“Merrill and Houston” [Wisconsin] built its first machine in 1862 and it achieved 104 in 1884; “Pusey and Jones” with the first machine was produced in 1867 and it achieved 22 in 1880).

The technological changes were constant from the late nineteenth century to the early decades of the twentieth century. The most important part of these improvements came from the United States and Germany. These changes allowed faster and wider machines. The international market of paper machines began to be controlled by German, Swiss and US machines from the 1870s onwards. To the qualitative leap forward was very important the building of wood grinders and other machines linked with wood pulp and its integration with paper production. British workshops lacked of these. British workshops sold mainly to the domestic. They kept some export capacity until World War I. After the war, exports decreased. They were focused mainly on Canada, Australia (and New Zealand), and India. British workshops began to lose ground in the late nineteenth century. Global markets were being increasingly supplied by US and German works. British workshops kept some exports in the Empire.

The general reasons for this decline can be also applied to British engineering. This paper, without forgetting them, is much more focused on the endogenous explanations of it. The first group of reasons comes from the supply side. The British papermaking industry had slower growth than in other countries such as Germany and the United States from the late nineteenth century onwards; the specialization of the main German and Swiss firms in the Second Technological Revolution engineering (electricity, turbines, etc.) allowed them to keep a dense commercialization network; British workshops began to lose ground in the new technological landscape, with the advent of major improvements from the US and German workshops. The second group of reasons comes from the demand side. Demand volume and

structure determined the characteristics of the machines. Firstly, the volume of British demand ranked among the highest worldwide. Secondly, the structure was quite different from other countries, focused on more standardized types of paper. This demand structure was different from the main part of the European market, which was much more diversified.

The sources used in this paper are mainly from firms archives: “Brian Donkin” (Derbyshire Record Office, Matlock); “Bentley & Jackson” and “Wamsleys’s” (Bury Archives Services, Bury); “Geo. and W. Bertram” and “James Bertram” (National Records of Scotland, Edinburgh). Also, a key source is papermaking technical journals.

Keywords: industrialization; technological change; machine building; papermaking.

Luciano Segreto (University of Florence)

The luxury train of the elites: The Compagnie Internationale des Wagon-Lits and the first globalization, 1876-1914

The history of international railway systems is relatively well known. Much less known is the role of a company that entered in the public imagination thanks to one of the most famous book written by Agatha Christie, ‘Murder on the Orient Express’. This famous train was just one of the several special lines managed by the Compagnie Internationale des Wagons-Lits (CIWL), better known in the UK as the International Sleeping Car Company, a firm established in 1876 in Brussels by the Belgian banker and entrepreneur Georges Nagelmackers. The paper will explore the period until the First World War, analysing the features of this particular business which was strictly connected with the development of the international luxury tourism. The original model was American, as Nagelmackers visited the United States in the early 1870s, and appreciated the pleasure of sleeping cars on long distance trips. The business model was to put on a train the concept of a luxury hotel with all its advantages for the new aristocratic and bourgeois elites willing to emulate the myth of the Grand Tour but in better conditions. The CIWL became a sort of symbol of the cosmopolitan world of the Belle Époque, linking together countries and elitist values. On the economic and financial side, the company experienced a continuous development until 1900. The shareholders considered themselves part of the same world the CIWL was symbolizing, while the financial network build by the founder included some of the most important German and French private bankers. The good results achieved in the first 20 years permitted CIWL to diversify and widen the operations of the company in a correlate sector, which from the 1890s started the activity of the luxury chain hotel under the name of Compagnie Internationale des Grands Hôtels. The first modernization and reorganization of the company arrived with the beginning of the twentieth century, when the miscalculations of the investments for the Universal Expo in Paris provoked a financial crisis that was solved only with the participation of the British finance and thanks to the personal intervention of Davison Dalziel (later Lord Dalziel), who became one of the most prominent shareholders and introduced a more effective managerial style in the strategy of the company, which contributed to re-establish a new growing phase until 1914.

The paper is based on a series of financial sources of that period, the official reports of CIWL, and some French, English and Belgian archival sources, unfortunately not including the company’s archives that despite efforts made are not yet available. The paper has several research questions: the internationalization of capital in the period of the first globalization, the “de-nationalization” of the ownership of the company, the relations between a service which is by definition mainly international and the role of national railways systems, and national laws and rules for the introduction of this special service, the specificity of the managerial capabilities in an elitist segment of the market, and the contribution to the development of luxury tourism during that period.

I/D Rural Inequality

Mark Stelzner (Connecticut College)

The Labour Injunction and Peonage: How changes in labour laws increased inequality during the Gilded Age

Like the period in which we currently find ourselves, the years between Reconstruction and the Great Depression witnessed shocking increases in income inequality. In 1869, the income shares of the top 1.0 and 0.1 per cent of the population were 9.98 and 3.85 per cent of all income respectively (Stelzner, 2015). These numbers represent relative lows in the history of the United States and are comparable to the late 1970s. By 1913, the next year for which we have data, the income shares of these elite groups had jumped to 17.96 and 8.62 per cent. While they decreased in the later years of the 1910s, the income shares of the top 1.0 and 0.1 per cent spiked again in the 1920s reaching 23.94 and 11.54 per cent in 1928 (Piketty and Saez, 2003). These latter figures represent highs comparable to the present.

How do we understand this astronomical increase in inequality that began in the Gilded Age and extended through the New Era? Like at present, it is unlikely that shifts in supply and demand for skilled labour explain such dramatic movements in the income shares of those at the very top (Piketty, 2014). Could it be the result of taxation? Piketty, Saez, and Stantcheva (2014) show that changes in top marginal tax rates are important in explaining income inequality at present. However, there was no federal income tax between 1872 and 1913. Thus it is unlikely that changes in taxation can explain a large part of the increase in inequality during this period. Was it the result of a change in interfirm power dynamics? Stiglitz (2012), Bivens and Mishel (2013), and others argue that the current increase in inequality is the result of an increase in rent seeking and top managements increasing ability to capture those rents. Parallel to this, Stelzner (2016) argues that changes in labour laws and norms over the last three and a half decades explain the increasing ability of management to seize the gains from economic activity. Could a change in interfirm power dynamics explain the increase in inequality during the Gilded Age?

In this paper, I seek to answer this question by creating a narrative of change in labour law in the North and South – two very different places during this period. For the North, I look at the increasing activism of the courts, to the detriment of many state and local legislatures, in creating and expanding the use of the labour injunction. For the South, I look at how states, supported by the courts, created a system of peonage that ensnared large portions of southern labour and lasted well into the twentieth century. As we will see, these developments are important for understanding the increase in inequality during the Gilded Age.

Michael Pammer (Johannes Kepler University)

Did higher inequality in agriculture enhance productivity? The case of Cisleithania, 1902

The paper examines the effects of inequality in agriculture on agricultural productivity in the Austrian part of the Austro-Hungarian Monarchy. It tests two concurrent hypotheses:

1. A higher degree of inequality promoted productivity because larger estates were better able to make use of technological advances such as machinery, more sophisticated fruit rotation systems, and more flexible use of manpower. They profited from economies of scale and stronger market integration.
2. A lower degree of inequality promoted productivity because in small and medium sized estates the owners were the actual operators, and some of the farm labourers were the owners' relatives. Both raised operators' and employees' commitment to farms and output. Generally, in small and medium sized farms the proportion of wage labour was lower than in very large estates. In these farms, labourers usually lived on the farm not in their own houses, which facilitated control over their doing, and helped to enforce work discipline.

In 1902, the Austrian Statistical Office conducted an agricultural census which included all agricultural holdings in the country without exception. It informs about the size of farms, types of cultivation, personnel, machinery equipment, livestock, and numerous other items. Most variables are broken down by the size of farm holdings, and by the type of cultivation (such as the proportion of arable land and meadows, forest, gardens, and others). In addition to the census data, the Ministry of Agriculture produced annual harvest statistics, which provide information on the main cereals and on a number of other products both by area and by output. In 1900, the Statistical Office counted livestock as well, in connection with the general population census.

Almost all of these data are available for every one of about 370 districts. The exceptions are a number of less important agricultural products which were recorded for 104 “natural regions”. Cereal and livestock data are available on the district level in great detail.

The data on livestock and the harvest data allow an estimate of agricultural productivity both in terms of labour productivity and productivity per area. Livestock data, from both the 1900 and 1902 censuses, and average crop production in the years around 1902 are used to calculate production, labour force, and area. The size and value distribution of agricultural property is calculated on the basis of the 1902 data and is used to estimate inequality measures such as Gini coefficients, coefficients of variation, and shares of the top classes of farms in overall property.

Agricultural productivity as the dependent variable is explained in models which employ those inequality measures together with other independent variables such as climate and soil indicators, machinery, spatial autocorrelative effects, and others. These models are used to test the two hypotheses mentioned at the beginning.

Results suggest that, *ceteris paribus*, a higher degree of inequality did indeed raise productivity both in livestock production and crop production as well as in overall production.

Felix Boecking (University of Edinburgh)

The PRC's Land Reform in the early 1950s: New findings from the Cadre Archives?

The Land Reform of the early 1950s is often seen as the key to the Chinese Communist Party's gaining of power in China's countryside. The Party, so the established narrative goes, ended an uneven distribution of land, thus creating loyal subjects, and dramatically changing the socioeconomic structure of China's countryside. We have known since the 1950s that the Land Reform did not create conditions of equal landownership in China's rural society, since the Party feared that land reform on such a scale would bring rural productivity to a standstill. Established models of the Land Reform suggest that the outcomes of land reform in the PRC were a more equal, if not perfectly equal distribution of land, taking account of regional differences which reflected differences in previous ownership structures, geographic differences, and different cultivation patterns. In fact, new archival evidence suggests that the outcome of land reform in the PRC differed not just between regions, but even between different villages within the same county, based on the political process of the Land Reform Campaign, suggesting that the most important variable in explaining land reform outcomes were the politics of China's socialist revolution.

I/E British Economy since 1945

David Higgins (Newcastle University) & **David Clayton** (University of York)

Buy British campaigns after 1945: why 'soft' preference didn't work

In broad terms, the performance of the British economy after 1945 has been viewed as weak. Particular criticism has focused on low levels of productivity and recurring balance of payments crises. A fundamental problem was rapid import penetration: between 1955 and 1980, imports as a percentage of domestic demand increased from 8 to 30 per cent.⁵⁷⁰ Using a diverse range of official documents held at The National Archives, supplemented by CBI records and associated trade commentary, we examine a collective strategy sponsored by the government to solve this chronic and deepening problem of high import penetration: 'Buy British' campaigns of the 1960s and early 1980s.

Such campaigns have been documented for the US and for earlier periods of British history. For the former, Dana Frank, a social historian, has indicated how 'Buy American' agitation was justified by trade unions and employer organizations because it protected US jobs; for the latter, to trace shifts in cultures of consumption, David Thackeray and Richard Toye have analysed the change from prewar campaigns promoting empire products to postwar marketing initiatives using the slogan 'Buy British'.⁵⁷¹ Our focus is new, on initiatives during the 1960s and early 1980s.

A priori, there is justification for believing that a 'Buy British' campaign might have worked: the marketing literature indicates that country-of-origin effects can be pronounced. The earliest academic marketing studies assessing these effects, which date to the mid-1960s, show that consumers had a general preference for domestic, not foreign products. Although subsequent scholars were critical of the use of 'single cue' studies – which tend to overstate the importance of country of origin, there is agreement that this origin effect still exercises influence.⁵⁷²

Nonetheless, we demonstrate that in 1960's and 1980's Britain the obstacles confronting 'Buy British' campaigns were substantial. It is useful to divide our analysis into two periods: the 1960s (when Britain did not belong to the European Economic Community) and the 1980s, when Britain was a member of the EEC.⁵⁷³ In the former period Britain was free to pursue its national interests without regard to the Treaty of Rome. During this period, it was imperative that a national campaign, orchestrated by a body representing British industry as a whole should spearhead a 'Buy British' campaign. But which body? The CBI was the obvious choice because it emerged from the Federation of British Industries, which had been proactive in campaigns during the 1930s. However, the CBI was firmly against any such marketing strategy because it conflicted with its determination to promote the liberalization of world trade.

The British Labour government approached other major employers' bodies, such as the Retail Distributors Association which possessed the necessary national infrastructure to effect this task, but it, too, did not want to sponsor a *general* 'Buy British' campaign. The only other solution was for an appropriate government agency to coordinate a campaign but there was considerable reluctance within government to this option. Internal investigations revealed that there was limited scope for public authorities and British industry to buy a

⁵⁷⁰ K. Williams, J. Williams and D. Thomas, *Why are the British Bad at Manufacturing?* Routledge & Kegan Paul, London: 1983, Table 4, pp.118-119. There existed marked variation between industries in the level of import penetration.

⁵⁷¹ See, for example David Thackeray and Richard Toye, 'From "Empire Shopping" to "Buying British: the public politics of consumption, 1945-63' (EHS Conference, 2012); D. Frank, *Buy American*. Boston: Beacon Press, 1999.

⁵⁷² See, for example, Papadopoulos, N. and Heslop, L., *Product and Country Images: Research and Strategy*, The Haworth Press, New York, NY (1993).

⁵⁷³ We recognize, of course, that the general macro-economic performance was dismal for both periods.

higher proportion of products made in Britain; even the nationalized industries could not increase their domestic purchases because they already purchased the majority of goods from within the UK. A further reason for hesitation was the lack of survey data on consumer preferences, the main component of domestic demand. The government did not know the answer to a fundamental question: would UK consumers respond to national 'Buy British' marketing campaigns? Without such knowledge the government was reluctant to launch a national campaign that might not work.

During the early 1980s, a further attempt was made to launch a 'Buy British' campaign, prompted by the fact that the UK balance of trade became negative in 1980. However, Britain acceded to the EEC in 1974 and was no longer free to pursue its national interests without regard to the Treaty of Rome and subsequent European Union legislation. For our purposes, it is necessary to emphasize two themes. First, during the 1980s, efforts to promote the purchase of domestic products at the expense of those of member states was judged unlawful. Consider, for example, UK efforts to promote the purchase of clothing and textiles, electrical appliances, footwear and cutlery – all of which experienced rapid import penetration. Such schemes – known as 'measures having equivalent effect' to quantitative restrictions such as quotas – were not permitted under laws governing European competition.⁵⁷⁴ Second, to be successful, marketing campaigns extolling the benefits of domestic products, need a clear marketing 'hook' such as 'Made in'. But in this respect, successive UK governments and the EU have been largely passive: there were no attempts to make use of such indicia compulsory.⁵⁷⁵ Manufacturers and distributors attached a diverse range of marks indicating geographic origin to products, but many goods had no such markings.

Keywords: growth; marketing; consumption; country of origin; economic policy; European.

Peter Scott & James Walker (University of Reading)

The origins of the British housing crisis: 'stop-go' policy and the restriction of private residential house-building

From the early 1950s the Treasury and Bank of England successfully pressed policies of 'stop-go' aggregate demand management, initially to facilitate the restoration of sterling as a 'strong' international currency and re-establish the City as a major financial and trading centre. The 'stop-go' literature generally focuses on the impacts of restrictions on manufacturing industry, particularly consumer durables – through hire purchase controls, variations in Purchase Tax, and controls on loan and equity capital for firms in these sectors. However, there was another major strand of stop-go policy to which the Treasury and Bank of England accorded similar importance, the restriction of house-building and house mortgage lending.

Stop-go restrictions were applied to public sector house-building by reducing the loan sanction for the necessary borrowing and raising the interest rates facing local authorities, as acknowledged in some specialist housing studies.⁵⁷⁶ However, the other major strand of stop-go policy in housing, the restriction of private house-purchase and mortgage lending, has not been discussed in the secondary literature. A few studies have noted that low building society interest rates (relative to general interest rates) was a significant factor behind the boom-bust cycle of house-prices, but these did not identify the maintenance of this interest rate differential as a deliberate policy measure.⁵⁷⁷

⁵⁷⁴ Attempts to persuade the EEC that consumer protection was at the forefront of this scheme were rejected.

⁵⁷⁵ Food, wine, and certain pharmaceutical/veterinary products are the exceptions.

⁵⁷⁶ See, e.g., Fred Berry, *Housing: the Great British Failure* (London: Charles Knight, 1974), p.51; Brian Fennimore, *Houses from the Factory. System Building and the Welfare State, 1942-74* (London: Rivers Osram, 1989), p.83.

⁵⁷⁷ Fred Berry, *Housing: the Great British Failure* (London: Charles Knight, 1974), p.47.

The Treasury used a combination of informal pressure and, less frequently, formal requests, to set mortgage rates, and rationing, at its desired level.⁵⁷⁸ Officials particularly valued this instrument of stop-go policy owing to its effectiveness and its ‘invisibility’ (mortgage lending restriction was not publicly announced and was not generally even subject to Cabinet discussion). As a 1973 Bank of England memorandum noted, Building Society Association ‘reactions to official monetary policy were sufficiently indirect for them not to be seen by the ordinary observer as the desired effect of Government [interest rate] policy’. A later annotation replaced ‘desired effect’ with ‘principal objective’.⁵⁷⁹ Meanwhile political pressure for action to increase house-building and home-ownership (especially in the run-up to elections) led to a perverse situation where government was sometimes simultaneously boosting demand for house-purchase and covertly restricting supply – feeding into a growing house-price spiral that has become a characteristic feature of the British housing market.

This study shows that restricting private house-building and house purchase was viewed by the Treasury and Bank of England as a key instrument of stop-go policy, reducing both consumer expenditure and capital investment (as other forms of construction, such as roads and schools, were closely linked to the volume of new house-building). Its implementation for most of the period between the mid-1950s and the late 1970s had a number of major cumulative impacts on the British economy, including depressing the long-term rate of capital formation in housing; creating inflationary expectations for house purchasers; impacting negatively on living standards (especially for lower-income families); and damaging the growth, productivity, and capacity of the house-building sector and the building society movement.

The paper outlines how the Treasury used the Building Society Association cartel (that encompassed interest rates) to ensure that building society interest rates – and, therefore, mortgage lending, was kept below market-clearing levels. The following sections then discuss the evolution of policy from the mid-1950s to 1979, together with contemporary qualitative evidence of its impacts.

We then provide quantitative comparisons of housing development in Britain, both historically and relative to other West-European countries. Interwar private sector housing completions (per thousand households) are shown to have been substantially higher than postwar completions, as was the contribution of dwellings to GDFCF. Total housing completions are also markedly below the levels of the mid- and late 1930s, but the difference is less – possibly reflecting the fact that, unlike private house-building, government restriction of local authority housing was not ‘invisible’ to public scrutiny. Britain is also shown to be a negative outlier compared to Western European countries, in terms of its ratio of gross fixed capital formation in dwellings to GNP/GDP. This is followed by an econometric analysis of the impact of differentials in building society mortgage rates and Bank Rate on levels of private sector house-building, together with impacts on house prices. The paper concludes by evaluating the long-term welfare impacts of policy and its influence on Britain’s subsequent housing record.

⁵⁷⁸ For example, a formal request was issued in May 1966, see BSA, Policy Committee minutes, memorandum of a meeting at the Treasury, 18th May 1966.

⁵⁷⁹ Bank of England Archives, 5A.45/1, ‘Control of Building Societies,’ memorandum, initialled C.J.W., 11th July 1973.

Aashish Velkar (University of Manchester)

'Inching towards the metre': European economic integration and the political trilemma of British metrication c.1960-80

On Brexit day (23 June 2016), *The Guardian* reminded its readers about the '10 best Euro myths' – the coloured way Britons had come to view Europe. One of these myths was that European metrication laws had 'criminalized' the use of the Imperial *inch* such that even The Queen was forced to 'obey Europe'.⁵⁸⁰ The story shows how the anti-Europe sentiment expressed in the context of metrication remained alive in popular perceptions of Europe nearly forty years after Britain's half-hearted conversion from the imperial to the metric measurement system. A J P Taylor had written 'now is the time to protest and to ensure that [the parliament] throws out metrication ... write to your MP and tell him to vote against metrication.'⁵⁸¹ And yet it was Harold Wilson who had promised to the EFTA Prime Ministers at the Vienna meeting in 1965, 'we intend [that] the United Kingdom should advance progressively towards the adoption of the metric system as its primary system of weights and measures'.⁵⁸² Wilson's commitment to inch closer to Europe by giving up the imperial *inch* was made in anticipation of Britain's second (unsuccessful) application to join the EEC in 1969 and before the EEC Directive of 1971 by which Britain would have been required to convert to the SI/metric system following the successful application of 1973.⁵⁸³

The issue of metrication that simmered throughout the 1960s and boiled over into a full-blown public squabble during the 1970s is a good candidate to study how the political trilemma of global integration confronted Britain at the time. Rodrik outlined the concept of the trilemma of an integrated world economy whereby nations are able to achieve any two objectives from amongst the following three: international economic integration, independent administrative policy making at the level of the nation state, and highly mobilized domestic mass politics.⁵⁸⁴ The menu of choices in the trilemma basically involves restricting democracy to reduce transaction costs and encourage integration, or to limit globalization to preserve national sovereignty and democratic institutions, or to give up sovereignty and hope domestic politics is aligned with supranational (democratic) decision making to reduce transaction costs for global integration.⁵⁸⁵ Britain has confronted this 'damned-if-you-do-damned-if-you-don't' scenario in its difficult relationship with Europe since the 1960s.

Development of the UK's 'metrication' policy during the 1960s and 1970s involved various domestic groups (industrialists, technocrats, consumer groups, politicians) who held differing views regarding metrication. This study shows how the policy fuelled notions of declinism and the use of declinist language in the framing of the debates.⁵⁸⁶ People invoked traditional values and customs in order to reconcile the notion of decline, which in turn further solidified entrenched positions on all sides of the debate. Tradition collided with ideas of modernity when modernization (in the form of international standardization) was perceived to threaten democratic values ('the tradition of voluntary choice'). Mingled with oversimplified

⁵⁸⁰ 'The 10 Best Euro Myths', *The Guardian*, 23 June 2016, <https://www.theguardian.com> (accessed online on 6 July 2016). The original story was reported by the *Daily Telegraph*; 'Queen obeys Europe and adopts metric rule', *The Telegraph*, 20 Aug 2001, <http://www.telegraph.co.uk> (accessed online on 14 October 2016).

⁵⁸¹ A J P Taylor, 'This Metric Madness' *Sunday Express*, 23 August 1970.

⁵⁸² The National Archives, T224/1856, 'Text of EFTA Announcement'.

⁵⁸³ EEC Directive 71/354/EEC

⁵⁸⁴ Dani Rodrik, 'How Far Will International Economic Integration Go?', *Journal of Economic Perspectives* 14, no. 1 (2000), pp.177-186.

⁵⁸⁵ Dani Rodrik, *The Globalization Paradox: Democracy and the Future of the World Economy*. (WW Norton, 2011).

⁵⁸⁶ For declinism, i.e. notions of decline see Jim Tomlinson, "Thrice Denied: 'Declinism' As a Recurrent Theme in British History in the Long Twentieth Century." *Twentieth Century British History* 20, no. 2 (2009), pp.227-251; David Edgerton, *Science, Technology, and the British Industrial "decline", 1870-1970*. (Cambridge University Press, 1996).

or erroneous understanding of economic realities (the interconnectedness of myriad economic sectors) and the exaggeration of potential ‘costs’ of conversion (which could never be established with any degree of accuracy), the political debate in the 1970s became increasingly acrimonious and vicious. Many industrial sectors paid the price of uncertainty. By the time Thatcher’s ministers halted further metrication in 1980 the result was what *The Economist* termed as ‘Imperial folly’: a country mired in metric muddle, with most consumers more upset by the confusion than by the metric system.⁵⁸⁷

Although studies of globalization and international standardization adopt notions of ‘isomorphism’, they are unhelpful when studying standardization was itself the cause of the discontent with globalization. Further, a study of the trilemma between domestic politics, administrative policy-making and economic integration needs a deeper historical appreciation of how groups ‘framed’ the issues at stake. Individual groups were not trying to solve the trilemma, even if they had understood the contemporary issues they faced using the language used by later scholars. Rather people were involved with resolving immediate concerns confronting them and doing so required ‘framing’ complex political and economic issues in particular ways.

Using an eclectic range of sources (government archives, parliamentary debates, business archives, newspapers, popular literature, etc.), the paper shows how, for example, metric standardization policy was promoted by some groups on the basis of ‘national competitiveness’, but opposed by others on the basis of ‘voluntary or individual choice’. The cultural and social understanding of economic phenomenon (including the operation of ‘free markets’) greatly influenced how different contending groups framed the issues and fuelled a national debate on metrication. In an environment where the benefits or consequences of economic integration were disproportionately felt by different groups, and where they could not be estimated in any reliable fashion, the relative salience of contending frames determined how distinct groups grappled with globalization, economic decline and standardization.

The lesson from this case study of recent British history is that increased international standardization was not always a solution for domestic *economic* problems, when the international standards themselves are the source of *social* discontentment with globalization. In such situations, divergence in the ‘framing’ of complex issues exacerbated the notions of decline created by deterioration in the domestic economic or social environment. Such divergent framing may lead to promotion of standards to be the ‘solution’ by some groups, whereas those who oppose standardization may consider it to be the ‘problem’. The more intractable the views are the more it feeds into the notions of decline all around. This situation results in a heightening of discourse about modernity (or liberal values) and how it clashes with traditional values. The resolution of such divergent views involves a complicated political process that may further complexify the trilemma of global integration. A stalemate or halfway situation may be the result of this process wherein the nation-state is caught navigating the treacherous space in between the three nodes of the trilemma. The paper shows how, as the British economy moved closer to Europe between 1960 and 1980, the UK inched towards the metre slowly but not surely.

⁵⁸⁷ ‘Imperial Folly’, *The Economist*, 17 November 17 1979, pg. 111.

I/F Development in the Middle East

Vassilis Sarantides (University of Sheffield) & **Pantelis Kammas** (University of Ioannina)

Democratization and taxation: Greece versus Europe in the long nineteenth century

The extension of the voting franchise is expected to be associated with more government spending and higher levels of taxation (Meltzer and Richard, 1981). This is because franchise extensions move the median voter to poorer segments of the population, causing increased demand for redistribution and fiscal expansion. However, many studies highlight the importance of intermediating factors, which make the relationship between democratization and fiscal policy much more complex.

We suggest that the structure of the domestic economy upon democratization – and the corresponding level of economic development – constitutes an intermediating factor of paramount importance, for the following reasons. First, industrialized and urbanized economies are in urgent need of investment in infrastructure, sanitation and health-related amenities especially during the first years after industrialization (see Szreter and Mooney, 1998). This is because industrialization and the corresponding domestic migration of the working population from the countryside to the towns generates severe problems of increased urban mortality that should be addressed by investment in health-related amenities. Thus, in these economies extension of the voting franchise is expected to lead to increased tax revenues that are mainly directed to investments in urban amenities like investment in clean water, sewers, local transportation and gas works (see Aidt et al., 2010). Obviously, this type of public investment could not be the case for a less developed agricultural economy, since the latter does not present such types of needs. Second, as can be easily understood, when franchise reforms take place in an agricultural economy the median voter is clearly an agent who is employed in agriculture and resides in some rural area. In contrast, when democratization takes place in a more industrialized economic environment, the median voter is located either in the middle class or in the class of workers of the industrial sector (see e.g. Aidt et al., 2010). Differences in the identity of the median voter imply significant differences in the preferred policy and consequently in the policy implemented by the authorities.

We test the importance of this intermediation factor by comparing the case of Greece with that of 12 other European countries. Greece is a unique case since it democratized after its first big voting reform in 1864, granting voting rights to all adult males, during a period where it was an agricultural economy with 76 per cent of the workforce occupied in the agricultural sector. This appears to be in stark contrast with the rest of the European countries that democratized during the nineteenth century. More precisely, the average workforce occupied in the agriculture sector in the year of democratization for this sample of countries is half to that of Greece, namely about 38 per cent – indicating that other sectors of the economy (e.g., industrial sector) were significantly more developed. This set up allows us to test if the structure of the economy upon democratization, and consequently the identity of the median voter, plays a role for the pattern of fiscal policy in the post-reform era.

Our results support this hypothesis. More precisely, in Greece democratization did not affect the level of total tax revenues (% of GDP) – though political economy motives led to a significant change in the structure of taxation (see Dertilis, 1993). In particular, after the reform of 1864, Greek governments started to implement a tax policy of radical reductions in land taxes so as to please the poor residents of the rural areas (i.e., farmers, peasants etc.). At the same time, losses in “rural taxes” were covered mostly by increases in indirect taxes that were not harmful in political terms since the rural population could evade this form of taxation through self-consumption. Therefore, for the case of Greece the change in the tax structure led to redistribution of income from the urban to the rural areas, where the median voter resided after the voting reform of 1864.

In turn, we compare the results we obtain for Greece with the corresponding empirical findings from a sample of 12 other European countries. Our analysis suggests that the effect

of democratization in Europe is conditional on the structure of the economy. More precisely, for the most industrialized countries of the sample (e.g., the UK), democratization increases the level of taxation and changes the composition of tax structure in favour of direct forms of taxation – with the aim of financing the increased needs of the median voter who resides in the urban areas. In contrast, for most agricultural economies of the sample (e.g, Finland) results are consistent with that of Greece where we observe no effect on the level of taxation and a change in the structure of taxation in favour of indirect taxes. Overall, we have clear indications for a diversified effect of democracy that depends on the structure of economy and the corresponding level of economic development upon democratization (e.g., Finland or Greece vs the UK).

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Gunes Gokmen (New Economic School, Moscow) & **Eren Arbatli** (Higher School of Economics, Moscow)

Minorities and long-run development: The persistence of Armenian and Greek influence in Turkey

Mass deportations and killings of Ottoman Armenians during WWI and the Greek-Turkish population exchange after the Greco-Turkish War of 1919-22 were the two major events of the early twentieth century that permanently changed the ethno-religious landscape of Anatolia. These events marked the end of centuries-long coexistence of the Muslim populations with the two biggest Christian communities of the region. These communities played a dominant role in craftsmanship, manufacturing, commerce and trade in the Empire. In this paper, we empirically investigate the long-run contribution of the Armenian and Greek communities in the Ottoman period on regional development in modern Turkey. We show that districts with greater presence of Greek and Armenian minorities at the end of the nineteenth century are systematically more densely populated, more urbanized and exhibit greater economic activity today. These results are qualitatively robust to accounting for an extensive set of geographical and historical factors that might have influenced long-run development on the one hand and minority settlement patterns on the other. We explore two potential channels of persistence. First, we provide evidence that Greeks and Armenians might have contributed to long-run economic development through their legacy on human capital accumulation at the local level. This finding possibly reflects the role of inter-group spillovers of cultural values, technology and know-how as well as the self-selection of skilled labour into modern economic sectors established by Armenian and Greek entrepreneurs. Second, we show some evidence supporting the hypothesis that minority assets were also instrumental in the development of a modern national economy in Turkey.

Michael Birnhack (Tel Aviv University)

Trademark registration, nationality and commerce in Mandate Palestine, 1922-48

Trademark registrations are a rich resource for economic history and law. Yet, unlike their legal sibling – patent registrations – trademark registrations are understudied, with only few studies of trademark data conducted by business historians. Legal historians are yet to delve into empirical studies of trademark data. This paper examines for the first time the trademark registration in Mandate Palestine, which is the region composing today's Israel and the West Bank, then under British control (as of 1917-18) and then per a Mandate of the League of Nations (1922-48). The British enacted a Trademark Ordinance in 1921, replacing the old, French-inspired Ottoman law, and then replaced it in 1938. Both the 1921 and 1938 laws were modelled after British laws of the time. The trademark enactments established a new trademark registration. Tracing the trademark data enables us to study the use of trademark law in action, along parameters of time, commercial class (since trademarks were classified and registered per a legal classification), along the national identity of the applicants, and taking into consideration legal changes.

The findings indicate high correlation between Mandate Palestine's trademark registration and the geopolitical events of the time: growing tensions between Arabs and Jews, the general strike and uprising of 1936-39, several waves of Jewish immigration (especially the Fifth Wave of immigration from Germany in the mid-1930s), World War II, and finally, the end of the Mandate. The analysis further illustrates how trademark data serve as a good reflection of broader economic activities, e.g. GDP figures, times of recession or growth, import and export patterns, and in particular industries, the trademark data serve as yet another resource that reflects the state of regulation or of competition in the relevant market over time.

The chief users of the local trademarks system were foreigners, namely British, American, German and other European traders, in this order. Among the local residents, most of the applicants were Jewish, despite their lower (but growing) percentage in the population. The only industry in which trademark practices were dominated by Arab Palestinians, Christian and Muslim, was the tobacco industry, especially in the 1920s. Analysing the registered classes points to the dominant industries, in descending order: pharmaceutical and medical devices, home supplies, food, raw materials, clothing, oil products, and finally, tobacco.

The findings should be read on the background of the state of industry and trade at the time in the region, which was amidst a shift from a pre-modern to a modern economy. The findings further enable us to approach the debate about Mandate Palestine's economy with new insights: whether it is best understood as one economy (Jewish and Palestinian combined) or as a divided economy composed of two, parallel economies with only few meeting points.

The findings also shed light on the British motivation and interest in enacting trademark law in the Mandate: this body of law was meant to serve mostly the colonizer rather than the colonized, though the trademark system was not per se exploitive. The trademark system did serve the local population, but as mentioned, it did so in a differential manner, with the Jewish traders far more active than their Arab counterparts. Introducing trademark law to the region served the British traders' needs to safeguard their new markets; it fit the British general IP agenda, though unlike copyright, there was no imperial plan to extend the law throughout the Empire; it fit the growing international IP legal schemes; it fit the British civilizing agenda for their colonies, and specifically, it fit their mission in Palestine, to rebuild the country after World War I, and work towards the establishment of a 'national home' for the Jewish people.

These findings are further supported by the study of the legal history of trademark law in Mandate Palestine, based on primary sources such as legislation and court cases, as well as archival material. An additional research layer is that of analysing the trademarks themselves,

with a focus on the local ones, along lines of nationality: Jewish and Arab marks. The reading of the marks indicates that trademarks had not only a market function of identifying the origin of the goods, but they also served as vehicles of cultural meaning. The use of language, images, and tradenames often conveyed Zionist messages, aimed at the local Jewish population. In Arab trademarks, we find less national signs. The British were sensitive to political uses of trademarks, and found ways to address controversial marks. As for trademarks of products meant for export, especially the export of local oranges, under the collective brand, Jaffa Oranges – the signs illustrate how local and foreign traders engaged in an exercise of cultural imagination and self-reflection.

The original trademark registration has not survived and was reconstructed for the purpose of this project from the publications of trademark applications, published in the official gazette. The reconstruction resolved various issues of missing applications, renumbering of applications and reclassifications thereof, supported by archival research.

I/G Development in South-East Asia

Jessica Vechbanyongratana (Chulalongkorn University) & **Christopher Paik** (New York University Abu Dhabi)

Legacy of colonial expansion on centralization and development: Evidence from Thailand

Prior to 1893, Bangkok's influence over Siam's territories varied greatly from strong control over a few provinces in the centre to loose tributary relationships with princely states in the frontier areas. Encroachment by French and British colonial powers on Siamese territories during the nineteenth century led Siam's King Chulalongkorn to adopt the *Thesaphiban* system – a centralized government structure with *monthons* as the second-level administrative unit – as a defensive strategy. Between 1893 and 1915, Bangkok brought its remaining territories under its new centralized administration starting with areas that were of the most strategic importance.

This study of Siam contributes to a larger literature on colonization and its impacts on institutions and economic outcomes, as it offers a new testing ground for the indirect effect of colonial threat on a state that maintained its sovereignty. Our central focus in this paper is to identify the impact of the adoption of a centralized government structure, achieved largely through the establishment of transportation and communications infrastructure, on long-run development outcomes in Thailand. In particular, we estimate the impact of the timing of provinces' integration into *monthons* on long-run provincial-level public goods provision and per capita gross provincial product (GPP). Our main proposition is that provinces located in *monthons* that were incorporated into the centralized government system earlier experienced higher initial levels of public goods provision, leading to higher levels of long-run economic performance. Although *monthons* as an administrative unit was relatively short-lived, this paper seeks to determine whether the formalization of central administration had lasting impacts on development outcomes at the provincial level beyond the dissolution of the *Thesaphiban* system in the 1930s.

The empirical analysis commences in three parts. First, we regress various measures of provincial-level public goods provision (specifically, rates of primary education attainment, household electrification, and household access to piped water) measured in 1970 on the timing of centralization, which is the year that a province is integrated into a *monthon*. Importantly, the timing of centralization correlates with the level of colonial threat that faced certain regions rather than the regions' economic and commercial importance to Siam. We specifically look at 1970 levels of human capital and infrastructure because it is the period just before the Thai government actively pursued economic development policies targeted at regions outside Bangkok and the devolution of some decision-making to local governments. We argue that the development outcomes during this time period are the result of a highly centralized provincial government system that can trace its origins to the *Thesaphiban* system.

Next, the analysis determines whether the timing of centralization is related to long-run provincial economic performance. The natural log of per capita GPP measured at various years between 1981 and 2010 are regressed on the year of centralization and other provincial-level controls. Finally, we use mediation analysis to determine if the channel through which the timing of centralization matters is through levels of public goods provision in 1970. We regress per capita GPP on both the year of centralization and measures of 1970 public goods provision.

The regression results indicate that the timing of centralization impacted the levels of all three public goods (education, electrification, and piped water access) in 1970, and its influence remained strong in the following decades. In fact, a province that was centralized under the *Thesaphiban* system 10 years later than another experienced on average a 2 per cent lower proportion of residents over the age of 14 who completed primary school, a 9 per cent lower proportion of homes with electrification, and a 4 per cent lower proportion of homes with access to piped water. The magnitudes are relatively large considering the mean levels

for primary education, household electrification, and household access to piped water are 7, 22, and 14 per cent, respectively. Likewise, we see that there is a negative relationship between the year of centralization and per capita GPP over different time periods from 1981 to 2005. The results indicate that provinces that centralized later, holding all else constant, have lower levels of per capita GPP. In fact, the results indicate that for every year later that a province was centralized, real GPP per capita was reduced by as much as 2.6 per cent. Finally, the mediation analysis results show that the coefficient on the year of centralization goes to zero with the inclusion of any of the mediation variables (1970 provincial measures of education, electrification, and piped water access), and the coefficients on the mediation variables are positive and highly significant. These results together suggest that the main channel through which centralization timing impacts per capita GPP is through 1970 levels of human capital and infrastructure development, which in turn can directly trace its origins to the establishment of the *Thesaphiban* system.

With the strongly persistent effect of the *Thesaphiban* system, it is only by the year 2000 that we observe its diminished influence on the level of public goods provision. Likewise, the impact of centralization timing on GPP per capita attenuates and is no longer statistically significant only by 2010. We explain these results by discussing the systematic changes that the Thai government implemented from the late 1970s in order to target and industrialize underdeveloped provinces. The government economic policy up until the late 1970s focused economic planning and development on urban Bangkok. Areas outside the centre were largely not targeted for the development of additional infrastructure after the initial infusion for strategic purposes, or other economic development activities. Thus, the levels of human capital and infrastructure development in the provinces through the 1970s can largely be traced directly back to the initial process of centralization.

To conclude, Thailand offers a unique testing ground for the economic impacts of institutional change and the centralization of a government system due to colonial threat. In the case of Thailand, provinces integrated early into the centralized government system due to strategic necessity gained higher initial levels of transportation and communications infrastructure and exposure to government policies, such as compulsory education, that resulted in better provincial-level economic outcomes over a century later.

Thanyaporn Chankrajang (Chulalongkorn University)

The unequal effects of the Great Depression on rural households in Siam, 1930-34: Crisis transmission through international rice trade

The Great Depression has been viewed as one of the major economic crises during the past century. It is agreed that its impact was widespread and profound, nevertheless little has been studied empirically on its effect in peripheral developing countries and at a more micro level. Such study, although very important in completing the picture and illustrating the complexity of the depression, could be constrained by the availability of the data.

This paper utilizes a rare statistical account of average household province-level data from the first two rural household economic surveys conducted in Siam just before and after the country fully experienced the Great Depression. Not only does the dataset enable the study to exploit time variation in the exposure to the crisis that was exogenous to Siam, it also allows the paper to compare the differential effect of the depression between the households with different degrees of exposure to international trade. Due to better exogenous geography, weather suitability and proximity to ports, households in the central plain cultivated rice for commercial exports, while those outside still mainly grew rice for subsistent consumption.

Based on the difference-in-differences and fixed effects analyses, the paper finds that the impact of the Great Depression on the rural households in Siam was significantly unequal. More specifically the impact on commercialized households was statistically significantly more strongly than that of self-sufficing households in terms of the reduction in (i) overall income, (ii) income from rice, (iii) total expenditure, and (iv) farm investment, although there

is no unequal effect in expenditure on necessities such as food. Interestingly, debts and debt-to-income ratio of the commercialized households were statistically significantly higher than that of non-commercialized households even during the crisis time – potentially suggesting the possibility of an absence of local credit contraction during the depression.

Given that Siam was a small peripheral country with undeveloped financial market and limited credit from abroad, the significance and the sheer size of the results found is striking. The only channel that linked Siam to the world economy that experienced an economic turmoil during that time was international trade. Even so, trade accounted for only a fraction of the Siamese overall GDP. My own calculation suggests that the degree of openness of Siam during 1929 was only about 14.66 per cent. Yet, the major finding of the paper elucidates that the existing unequal effects were deeply rooted in differential exposure to international trade. By being more exposed to rice commercialization and exports, and hence a slump in the rice price and export value due to rising rice trade barrier and sharp devaluation of baht after the abandonment from the Gold Standard, households in the central region were more severely hit by the Great Depression. As such, not only do the results illustrate the complexity of the impacts of the Great Depression, they also shed light on the importance of trade linkages as an international crisis transmitter – the crisis transmission channel that is relatively harder to empirically test in today's setups with macro-level data.

Masami Imai & Tuan Anh Viet Nguyen (Wesleyan University)

The effects of ethnic Chinese minority on Vietnam's regional economic development in the post-Vietnam War period

This paper examines the impact of the Hoa, an ethnically Chinese, economically dominant minority, on regional economic development in Vietnam. To address the endogeneity of the geographical distribution of this ethnic minority, we use an important historical episode: the Vietnamese Communist Party's post-Vietnam War discriminatory policies combined with the rapid deterioration in Sino-Vietnamese diplomatic relationship led a large number of ethnic Chinese to flee abroad, particularly to the refugee camps in Guangxi province of China. We exploit this exodus of ethnic Chinese as a natural experiment to identify exogenous variation in the share of ethnic Chinese across the Vietnamese provinces. We find that the effects of proximity to the refugee camps on the share of ethnic Chinese in 1989 are more pronounced for provinces that had a larger presence of the ethnic Chinese population in 1979. We also find strong correlations between the 1989 share of ethnic Chinese population (instrumented) and contemporary indicators of economic performance, such as per capita non-state industrial productions, population density, per capita consumption expenditure, and the share of population living in poverty. The results suggest that the ethnic Chinese minority had positive impacts on the regional economic development of Vietnam and that the post-Vietnam War exodus of ethnic Chinese is likely to have had long-term negative economic impacts.

I/H Water and Public Health

Romola Davenport (University of Cambridge)

Cholera epidemics as a 'sanitary test' of British towns, 1832-66

The malign contribution of northern industrial cities to the stagnation of national life expectancy over the period 1820-70 forms part of one of the most long-running debates in English economic history, regarding the impact of early industrialization on living standards. The pessimistic view argues that industrial cities experienced a worsening of mortality especially in the second quarter of the nineteenth century, and that this was due to the peculiar conditions of industrialization, including administrative breakdown and rising social inequalities. The period 1820-50 is particularly difficult to study because of a paucity of demographic data especially for towns. Here we use the official reports occasioned by the cholera epidemics of 1832, 1849, 1854 and 1866 to investigate sanitary conditions in British towns through the lens of water provision and sewage disposal. We argue from the chronology and geographical patterning of the epidemics that cholera spread rapidly through the population and that reported cases and deaths were only the visible peaks of a very widespread and high incidence of infection. Under these circumstances the key determinant of mortality was the extent to which infected sewage contaminated drinking water. The geography of reported deaths did not indicate that northern towns were especially deficient in this respect. Instead cholera mortality was associated with access to rivers and with mining, and the precocious development of sewerage systems may have aggravated epidemics. We discuss the consequences of our findings for mortality from other 'waterborne' diseases in this period, and their relationship to diarrhoeal mortality in young children.

Joost Veenstra & Daniel Gallardo Albarrán (University of Groningen)

Life expectancy and the diffusion of medical knowledge in the long twentieth century

Introduction

The twentieth century has witnessed improvements in health without parallel in human history. Average global life expectancy at birth increased from 32 years in 1900 to 70 years today (Riley, 2005). Yet the rate at which health improved varied considerably across countries and time. This cross-country variation is typically ascribed to two factors. First, to differences in the pace of economic development and, second, to the diffusion of medical knowledge across countries (Deaton, 2013). In this paper, we analyse the endogenous relationship between these two elements by tracing the diffusion of medical knowledge from high to low income countries during the twentieth century.

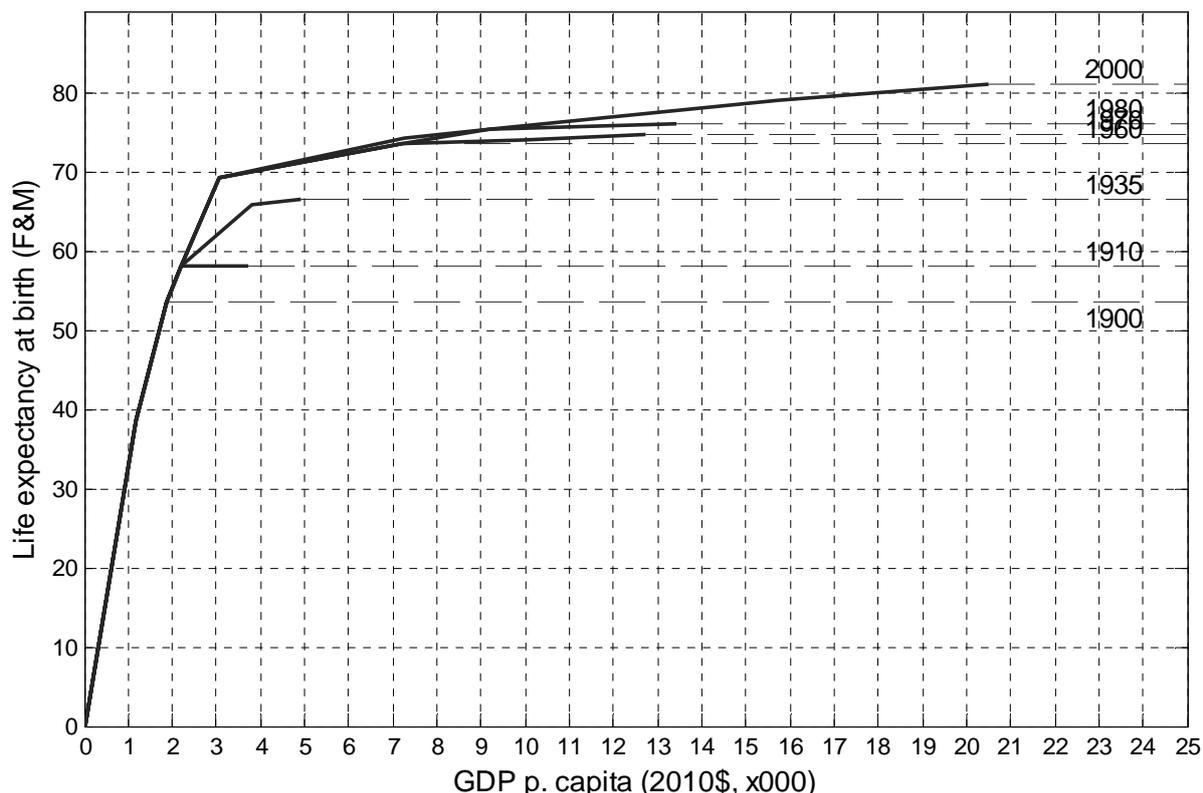
Using Data Envelopment Analysis (DEA) we estimate health functions (or 'Preston curves') that relate life expectancy to income levels for a set of both rich and poor countries between 1900 and 2000. In contrast to Preston's (1975) seminal work and subsequent research, we provide for the first time health functions that can measure 'local' gains in medical knowledge; advances in health technology that are realized predominantly in high income countries and that do not immediately spill over to poor countries (e.g. treatments of respiratory and cardiovascular diseases as opposed to hygienic medical practices based on the germ theory of disease).

Results

What was the diffusion pattern of medical knowledge across countries and time during the twentieth century? To answer this question, we will provide a two-step analysis using a balanced sample of 29 countries with data on life expectancy at birth and income per capita. First, we use DEA with a subsample of 14 Western countries where most substantial medical breakthroughs have taken place. Using this sample, figure 1 presents health possibility frontiers (HPF) in selected benchmark years during the analysed period. To interpret them, consider the following example. In 1910, countries with an income level of 1,000 US dollars

(PPP-adjusted and in 2010 constant prices) had the potential to attain a life expectancy of about 30 years. This potential increases as countries get access to more economic resources, resulting in higher consumption levels, better housing, etcetera. However, these income-driven gains in life expectancy become increasingly difficult – as captured by the diminishing marginal returns of the health frontier - and stop after reaching a maximum life expectancy of about 55 at an income level of roughly 2,000 US dollar. By 1910 countries such as Britain or the Netherlands already enjoyed income levels well beyond that point. Yet this extra income had no effect on life expectancy because they battled diseases like tuberculosis, for which there simply was no cure available at the time, regardless of a country’s level of economic development.

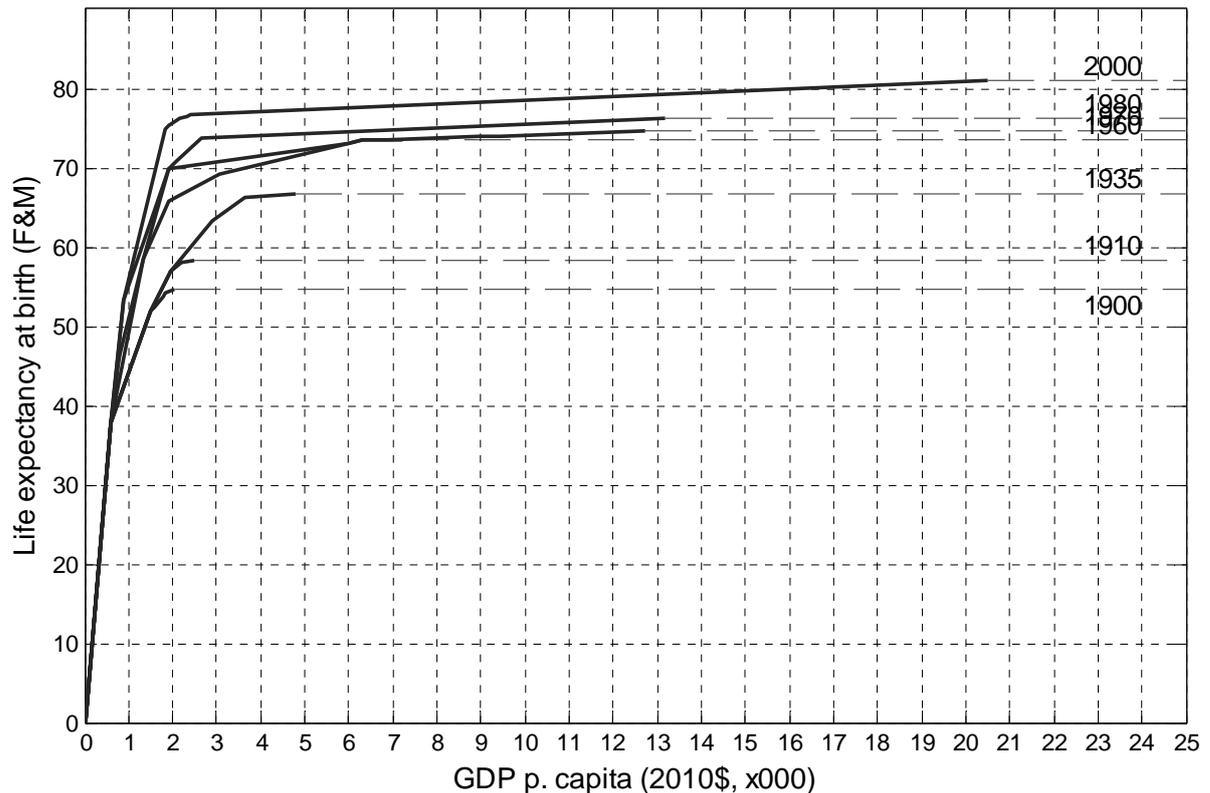
Figure 1: *Health possibility frontiers in the ‘West’, 1900-2000*



Over the twentieth century, the emergence of new methods of disease prevention and treatment has dramatically increased the potential to achieve high levels of health. Whereas an income level of 3,000 US dollars could achieve a life expectancy of around 55 years in 1900, by 1960 this figure had increased to almost 70 years. After mid-century, the HPF no longer shifts upwards at this level of income, but it still does at higher income levels. This suggests that within Europe new medical knowledge was applied only locally, at increasingly high income levels.

What explains this shift? Before WWII, most of the increase in life expectancy at birth is the outcome of relatively cheap investments that reduced the incidence of infectious diseases (especially among infants and children), such as water filtration and chlorination and efficient sewage systems. In the second half of the twentieth century, health-improving technologies implied invasive medical treatments, made possible only through substantial investment in R&D, that were much more intensive in human and physical capital (and therefore income dependent) than those of the pre-1950 period.

Figure 2: Health possibility frontiers in the 'West and the rest', 1900-2000



Does this pattern hold at the global level? In figure 2 we present the results of the same analysis, but now including all countries in our sample. A comparison between figures 1 and 2 shows that the HPFs in 1900, 1910 and 1935 were almost identical between the two samples, but differed substantially afterward. This implies that from 1900 until 1935 western countries determined the global frontier by developing and applying cutting-edge medical knowledge and that this knowledge was not yet applied in other places. By 1960 the global HPF has shifted upward considerably, also in the range of economic development levels well below that of the rich European countries. We do not interpret this as new knowledge being created in developing countries, but rather as delayed knowledge spillovers from developed countries. Medical knowledge could be adopted at levels of economic development much lower than those at which this knowledge was created in the first place.

As between 1935 and 1980 the largest shifts of the frontier take place at relatively low income levels, it appears that the diffusion of medical knowledge to developing countries had a much more substantial impact on global health improvements than the creation of new knowledge in developed countries. Afterward, however, between 1980 and 2000, the frontier moves out equally fast at high and low income levels, from which we can infer that both mechanisms were simultaneously at play. This is important, because without further medical innovation, there would be no possibilities left to improve health once the existing stock of knowledge has fully diffused throughout the world.

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Björn Eriksson & Jonas Helgertz (Lund University)

Water and sewage provision and its effect on infant mortality: A micro level analysis of Sweden, 1901-25

From the end of the nineteenth century, infant mortality in Sweden declined from about 17 per cent to less than 5 per cent in 1935. Together with declining fertility this had substantial consequences at the macro as well as micro level, reducing the dilution of capital per capita as well as enhancing labour productivity through increased human capital formation. Despite the importance of the mortality decline for modern growth, the understanding of which factors drove this decline is not fully understood. Indeed, Robert Fogel (1986) remained hesitant to call it one of the greatest human achievements, as he was unsure regarding how much of this development was due to human intervention. The question was not, he argued, whether factors such as economic development, medicine, public health or nutrition were involved in the decline, but the contribution of each respective factor to the decline.

This paper examines how mortality responses at the micro level were affected by the expansion of water and sewage services across Swedish towns at the beginning of the twentieth century. Our empirical strategy relies on combining information about the timing of the introduction of water and sewage with over 80,000 birth and death records for 20 different towns located across Sweden. The resulting temporal and geographic variation is exploited in order to estimate the effect that the provision of water and sewage had on infant mortality using a difference in difference framework. Our findings indicate that birth cohorts which had access to water and sewage faced a 10-20 per cent decrease in the risk of dying before turning one year old.

II/A Building the Medieval Economy

Auke Rijpma, Eltko Buringh, Jan Luiten van Zanden (Utrecht University) & **Bruce Campbell** (Queen's University Belfast)

Church building and the economy during Europe's 'Age of the Cathedrals', 700-1500

This paper presents new data on the construction history of about 1,100 major churches in Western Europe between 700 and 1500 CE. The idea is that church building can be seen as an index of economic activity, reflecting confidence in the future, command of substantial ecclesiastical revenues, mobilization of large teams of construction workers, and an ability to assemble impressive quantities of building materials at a single site, with the wider economic multiplier effects that this entailed. In a pious age, Church reform, monastic foundation and advancing architectural technology helped kick-start and then lend momentum to the process. Whether so much conspicuous construction activity was beneficial to or a burden upon Christendom's relatively poor and under-developed economy can be debated. What is clear is that churches, like the books and manuscripts produced in the same period, are artefacts that can be quantified. Whereas hard data are lacking for many other aspects of economic activity, at least before 1250, research by generations of architectural historians means that much is known about the construction history of individual churches, commencing with their original foundation. Putting this information together provides estimates of the ecclesiastical building industry for a number of European countries, currently Switzerland, Germany, France, the Low Countries and England but potentially extending to the whole of Latin Christendom. The results shed fresh light on the onset, scale, spatial dimensions and duration of the great economic boom that got under way sometime after 1000 and corresponding features of the long contraction then set in train during the fourteenth century.

Mark Casson, Katie Phillips (University of Reading), **Catherine Casson** (University of Manchester) & **John Lee** (University of York)

Urban property markets in thirteenth-century England: the Cambridge Hundred Rolls revisited

The commercialization of English towns during the thirteenth century has been studied mainly through the development of commodity markets and local trade. Recently information on local property markets from contemporary deeds and rentals has been examined too. This paper uses an additional source – the Hundred Rolls – to shed further light on medieval property markets.

Cambridge has excellent sources for the study of urban property, including early deeds of St. Radegund's Priory, St. John's Hospital and Barnwell Priory. Most significantly, it is one of only three towns to be covered comprehensively by the Hundred Rolls. The Cambridge Rolls were studied by Maitland (Township and Borough, 1898) but since he wrote additional rolls have come to light, and these have been transcribed and translated for this study.

The systematic nature of the Hundred Rolls investigation means that property information is presented in a highly standardized form. The rolls provide information on the descent of ownership (for up to five generations) for more than 1,000 properties in Cambridge in 1279. The nature of each property and its location (classified by fifteen urban parishes) is given, and rents payable on each property are itemized, including up to four different components payable to different individuals or institutions.

The systematic nature of the evidence makes it eminently suitable for statistical analysis. The paper re-works Maitland's pioneering statistical analysis and employs new techniques, such as hedonic regression, which were not previously available. The paper investigates whether rents were higher in specific areas of Cambridge, and whether high-rent areas were specialized in trade and other commercial activities. In particular, it compares the level of economic activity around the Castle with that around the Jewry and the Market Place, where economic activity is currently focused. The paper also examines the major property

owning family dynasties, and examines how far they focused their property portfolios on particular types of property in specific parts of the town.

The results of this analysis confirm many of Maitland's conclusions, and also reveal hidden patterns in ownership and rents that were previously overlooked. Overall, the study suggests that by the late thirteenth century the property market in medieval Cambridge was very active and highly commercialized. It also shows that property ownership was concentrated in the hands of an urban elite that was involved in both trade and knowledge-based services (law, education and royal administration). The results support the case for taking a more general view of the commercialization hypothesis that embraces urban land as well as commodity markets.

Helen Killick, Adrian Bell & Chris Brooks (University of Reading)

Speculative forces in the English property market, 1300-1500

This paper arises from an on-going three-year Leverhulme-funded project which investigates in detail the English real estate market c.1300-1500. One of the project's aims is to construct a time-series index of medieval English property prices and rents for the period. This index is used to detect signs of growing commercialization in the late medieval property market, and in particular the existence of price movements caused by speculation. In this paper, we discuss the data which we have hand-collected from the feet of fines, a type of legal document recording freehold land transactions, and analysed using a relational database containing approximately 21,000 transactions in total. The database has been designed to accommodate as much information as possible regarding the property location, its assets, and the identity of the buyers and sellers, allowing for detailed analysis of regional and temporal trends. The geographical coverage is extensive, including counties located in the North of England, the Midlands, the Welsh borders, the South West, London and the Home Counties.

These data have been subjected to econometric analysis in order to determine how the level of market activity (the number of property transactions), the nature of the properties (the relative proportions of different types of asset) and property values varied across regions and over time. The most obvious temporal trend is that of a gradual decline in the number of transactions over the course of the fourteenth and fifteenth centuries. However, this is punctuated by fluctuations which can be attributed to the effects of exogenous crises. In common with previous regional studies of the fines, we find evidence that the agrarian crisis and resulting famine of 1315-22 caused a significant rise in the number of property transactions at a national level, which may be the result of forced sales due to rising grain prices. Contrary to previous findings, we find that the overall decline in numbers of fines over the period was offset by a peak in market activity in the decades following the Black Death. We attribute this primarily to the increased mortality rate and corresponding number of posthumous sales. In addition, we argue that increasing geographic and social mobility during this period allowed for the development of property as a commercial asset. This is supported by evidence for rising property prices; in particular, the price of manors and messuages (a house and adjacent land and outbuildings) rose sharply in the decades following the Black Death, before falling significantly during the politically turbulent reign of Richard II.

In terms of regional variation, the total number of transactions in each county over the period can be seen to broadly correspond to the size and population of that county; so, for example, the relatively densely populated counties of Lincolnshire, Yorkshire and Kent account for a high proportion of the total number of transactions. However, the data reveal a notable exception, Essex, which recorded the highest number of transactions overall despite its population being relatively low. This may be attributed to the county's proximity to London, meaning that it provided commercial opportunities for buyers from the capital.

Analysis of the properties described in the fines demonstrates that different types of asset were more common in different counties, reflecting regional differences in climate and topography. For example, the counties of Devon and Yorkshire between them account for half

of the total quantity of moorland traded over the fourteenth and fifteenth centuries (particularly notable in the case of Devon, for which the overall number of fines is low); similarly, the counties of Hertfordshire, Kent and Essex account for over half the total acreage of woodland. The assets also reflect economic factors such as proximity to urban centres and trade routes; for example, transactions involving commercial properties such as shops occur frequently in the counties of Yorkshire, Essex and Hertfordshire, due to the influence of the cities of York and London respectively. The total acreage of land traded increased substantially during the late fifteenth century, indicating that whilst the number of transactions decreased, the properties themselves became substantially larger. The proportion of arable and meadow in relation to pasture and wood declined in the second half of the fifteenth century, reflecting changes in agricultural practice.

In addition to the impact of external socio-economic factors, we present evidence to demonstrate that, from the early fifteenth century onwards, the English property market exhibited signs of growing commercialization. One of the ways in which we investigate this phenomenon is by analysing patterns of behaviour amongst buyers. The data suggest that an increasing number of people in the fifteenth century engaged in property speculation; in other words, purchase for the purposes of investment rather than consumption. This is indicated in three ways: firstly, it became more common for people to participate in transactions as part of a group, which enabled the purchase of more extensive properties and increased the opportunity for profit; secondly, the number of individuals who were involved in multiple transactions increased, allowing for the accumulation of 'property portfolios'; and thirdly, an increasing number of these individuals purchased property at a distance from their place of residence. We find evidence that a high proportion of these buyers came from professional and mercantile backgrounds, suggesting that accumulation of capital through commercial activity was a contributory factor.

Keywords: medieval property market; property investment; speculation, feet of fines.

II/B Religion and Economics

Giada Pizzoni (University of Warwick)

British Catholic merchants and their global networks from the West Indies to the Mediterranean, 1600-1714

This paper makes an interesting contribution to the history of British Catholicism in the early global economy. It examines the ways in which religion could be instrumental in trade and how British Catholics moved beyond religious divisions and across imperial borders in order to secure successful economic strategies. By surveying Catholics' involvement in Atlantic and Mediterranean trade between 1670 and 1714, this paper looks at how they secured social integration through economic inclusion, defying the stereotype of marginalization and lack of entrepreneurial spirit. I aim to challenge assumptions of religious communality and offer an innovative outlook on Catholicism and enterprise.

The focus is on prominent London Catholic merchants with extensive commercial networks overseas and in Europe. By tapping into groups of co-religionists as well as non-Catholics, these merchants traded with associates in the West Indies and in various Mediterranean and Levantine ports.

In the Caribbean, they worked within the fluid borders of the European Empires. Mainly based in Montserrat and Jamaica, they used their religion and national identity to foster inter-imperial exchanges. They established contacts in French and British North America and in Portuguese and Spanish South America. However, the Atlantic world cannot be seen in isolation since the trading routes to the New World could also run through the Mediterranean. Therefore, attention to both seas is fundamental in order to understand international trade. Indeed, after surveying the commercial networks in the West Indies, the focus shifts to the south Mediterranean and in particular on the port of Cadiz.

In Spain, British Catholic merchants supplied the transatlantic vessels directed to the Indies with Mediterranean goods procured by their partners in Italian and Levantine ports. In particular, they worked with Livorno, Genoa, Marseilles, Naples, and Venice's possessions in the Ottoman Morea. In those centres, Levant-Mediterranean commodities met with colonial bullion and dies.

By starting with a survey of inter-imperial networks in the West-Indies and then moving into the Mediterranean, my aim is to prove that Catholicism allowed British merchants to establish global networks and to nurture inter-faith relations.

This paper argues that their religion was an important element that allowed them to work and prosper in Mediterranean and Atlantic trade. I will show that British Catholics saw an opportunity to integrate through the new economy. To the Protestant others, they offered the ability to access diverse markets, perfectly answering the needs of the new international trade that redefined religious and national borders.

Esther Sahle (University of Bremen)

Commercial dispute mediation by Philadelphia Quaker meetings, 1682-1720

The seventeenth century Atlantic witnessed an unprecedented expansion of trade. This process has been identified as crucial for the subsequent economic development of Britain in the period leading up to the industrial revolution. The causes for this trade expansion however remain disputed. The New Institutional Economists argue that new institutions for the protection of property rights played a key role. One community stands out as particularly successful in the Atlantic trade in this period: The Quakers. Traditional explanations for the causes of their commercial success, such as their business ethics and ostracism of debtors, have recently come under attack. Instead, this paper presents new findings that may help explain their prominence: The Philadelphia Quaker meeting mediated commercial disputes and enforced contracts, both for locals and merchants overseas. Thereby it took on the important role of enforcing property rights in a place where state institutions for this purpose

had yet to develop. This paper thus contributes to research into the institutional foundations of pre-modern long-distance trade in general, as well as current debates on the interplay between public and private order institutions in particular.

Clive Norris (Oxford Brookes University)

The economics of Methodism in the long eighteenth century

This paper examines how eighteenth and early nineteenth century Methodism raised and managed the resources that it needed, focusing on John Wesley's Methodist 'Connexion'. This began on a small scale in the late 1730s, but by 1800 was a substantial operation, present throughout the British Isles and abroad, employing hundreds of staff and running hundreds of buildings. It was a mass voluntary organization, with no landed endowment and few wealthy patrons. From the outset, therefore, its leaders thought carefully about what they called 'temporal matters', and they frequently took action to try to ensure that their evangelical and other activities remained affordable. At every level, lay stewards and other officials, sometimes substantial businessmen in their own right, supported the spiritual leadership in trying to keep the Connexion within budget and managing its accumulating debts.

The paper is based primarily on the analysis of the movement's local and national financial records, but also draws on other sources including preachers' diaries and correspondence, which often refer to financial concerns. However, the primary sources are both fragmentary and difficult to interpret, and the evidence which they offer has therefore been supplemented by modelling, for example of chapel construction and running costs, and the revenue and profits of the Wesleyan publishing business, the Book Room. The ambition has been to generate a plausible account of the movement's financial development, rather than a definitive one.

The paper describes how the Wesleyan Connexion's main activities – preaching and the provision of chapels – were organized and financed, and similarly reviews Methodist educational and welfare programmes and overseas missions. It discusses the complex financial relationships between the local societies and the wider movement, and the commercial history of the Book Room.

A suite of financial estimates is presented, including the key flows of income and expenditure at national and local level. The assumptions and funding models which seem to have underpinned its work are also explored. All this is placed within the context of practice amongst other eighteenth century religious organizations, including the Moravian Brethren, whose English operation suffered a spectacular financial collapse in 1753, and the Churches of England and Scotland.

As Wesley's movement expanded, its preachers became increasingly reliant on a growing population of part-time and lay officials. Whether deliberately or through trial and error, it adopted a wide range of resource management strategies and techniques, some of which proved controversial, but which overall helped the Connexion both to sustain local operations throughout the British Isles, and broadly to keep its expenditure in line with its available resources over a period of some decades.

One key theme of the paper is the constant struggle between Methodists' ambitions to recruit new members and expand their work, and the reality of the practical constraints faced by a movement with a predominantly working-class membership, a widening range of activities, and a conservative bias in financial matters, including a fear of acquiring excessive debt.

Another important theme is the growing dependence of the movement on voluntary contributions and loan capital provided by its wealthier members and supporters, as distinct from the regular small payments from the rank and file, which had been so important in its early days. This led to significant tensions, especially after John Wesley died in 1791.

A third theme is the Connexion's apparent capacity, from its earliest days, for constant financial innovation, in response both to the challenges of its own development and to

external pressures and opportunities. The leadership repeatedly proved inventive both in finding new sources of income and in controlling costs, though local reality often differed from national policy.

Finally, the paper discusses the impact of the growing scale of the movement on its financial practice. It charts the mutation of the informal – even haphazard – arrangements of the 1740s into a codified body of regulation which at least attempted to embody a stable, standardized and sustainable system for acquiring and deploying resources.

However, although John Wesley's Methodism demonstrated a continuing ability to attract and enthuse thousands of people, rich and poor, and embraced both the demands and the opportunities of the vibrant British market economy, the movement paid a price for its continued expansion. A hidden elite of preachers and businessmen became highly influential, and there was a general increase in the power of those with money. Such developments undermined – but did not destroy – the founders' original vision for the movement.

Keywords: eighteenth century; religion; Methodist finances; business history; social history.

II/C Charity and Poor Relief

Julie Marfany (University of Durham)

Quantifying the unquantifiable? Informal charity in rural southern Europe, seventeenth and eighteenth centuries

Historians of social spending disagree about the relative magnitude of sums transferred through formal poor relief compared with private charity before the welfare state. For some, such as Lindert, charity was always less significant than state expenditure. Others, such as Colin Jones and Lyn Hollen Lees, dispute this. This debate feeds into another, larger question regarding the relative generosity of social spending between northern and southern Europe. Southern Europe is regarded by many as having been less generous than northern Europe in terms of expenditure per capita and as a proportion of GDP. Such claims, however, are based overwhelmingly on estimates of formal social spending. The most recent study, by van Bavel and Rijpma, is praiseworthy in its broad approach to poor relief, encompassing assistance from charitable and religious institutions alongside public expenditure, and also attempting to include formal entitlements to rights of commons and gleaning. However, the authors explicitly exclude alms and collections for the poor. Given that a frequent criticism by contemporaries of southern European regions was the abundance of almsgiving, the omission of this practice may bias estimates of social spending downwards to a greater extent than for northern Europe. Omission derives largely from a lack of evidence, to the extent that almsgiving may well be regarded as unquantifiable. Some evidence does exist, however. Drawing mainly on examples from Spain, this paper will offer a first attempt to quantify sums transferred by almsgiving in different communities, through records of collections for the poor. These sums will be set alongside other types of charitable funds, in order to assess their relative significance. This paper will also examine just how widespread almsgiving was in rural society, and the role such informal charity played within particular local economies and social structures.

Frances Richardson (University of Oxford)

The impact of the New Poor Law on livelihoods of the poor in north Wales

By the 1830s, parishes in north-west Wales had developed a low-cost system of poor relief that suited the area's largely informal local economy. Poor relief was used to top up inadequate earnings of the elderly, single women adversely affected by declining proto-industrial earnings, and men with large families. Illegitimate children were usually fostered out, enabling their mother to return to work. Non-resident relief was widely paid to encourage migration. These practices were challenged by the introduction of the New Poor Law, which sought to draw a clear distinction between the able-bodied and the aged and infirm, and to curtail poor relief to able-bodied males and unmarried mothers except through a workhouse.

Previous research has revealed considerable regional and local variation in the way the New Poor Law was implemented in England, but the Act's impact in Wales has been little studied. This paper examines the impact of the New Poor Law on the livelihoods of the poor in north Wales, through a case study of the Llanrwst Poor Law Union in Denbighshire and Caernarfonshire. It analyses decisions on over 1,000 individual poor relief cases in the Union's first year of operation, together with Poor Law Commission statistics, Union minutes and Assistant Poor Law Commissioners' correspondence, to build up a picture of the ages, occupations and family situation of paupers, and how relief practice changed with the implementation of the New Poor Law.

The study finds that in north-west Wales, guardians and ratepayers were reasonably content with the old parish welfare system, and believed they should be allowed to spend their poor rates as they saw fit. They were overwhelmingly opposed to the erection of workhouses, which they regarded as expensive and irrelevant to local poverty issues. They attempted, with a fair measure of success, to preserve the previous low-cost system of poor relief without

recourse to a workhouse. The elderly continued to work for as long as possible, with earnings supplemented by poor relief; the emasculated bastardy laws were still used to obtain bastardy payments from fathers, though the phasing out of allowances for large families contributed to a rapid decline in the number of married farm labourers.

The administrative machinery of the New Poor Law also enhanced the agency of the poor by providing more opportunities to apply for relief, and by a degree of levelling up of standards between parishes. The new regime failed to reduce costs: the number of people receiving poor relief in the Llanrwst Union remained steady until 1844, peaking in 1845 before falling steadily. The cost of relief rose initially by about 25 per cent, but declined after 1850, due more to rising prosperity than to the eventual opening of a workhouse. The study's findings confirm that Wales was 'almost a different welfare country', despite attempts by the Poor Law Commission and its successors to bring about greater uniformity.

II/D Grain Markets

Mikolaj Malinowski (Lund University)

The power of consensus: parliamentarianism and market integration in Poland, 1505-1772

Understanding the relationship between the distribution of political power and the development of an economy is one of the core topics in economic history. According to Epstein (2000), changes in the organization of the relations of power within and between polities affected economic growth in preindustrial Europe. According to his theoretical model, economic growth at the time was primarily Smithian and therefore dependent on market conditions – in particular market integration. Furthermore, market conditions were dependent on jurisdictional consolidation of a mosaic of polities inherited from the middle ages. Through the early modern period, most of the European states consolidated and centralized under absolutistic or parliamentary regimes. Epstein argued that this development lowered transaction costs between the sub-regions within these countries. Centralization curbed the regional rent-seeking and free-riding that discouraged commitment of the regions to financing of the shared public goods necessary for market development. Centralization and third-party enforcement, mitigated the coordination failures and therefore allowed for implementation of uniform measurement, monetary, and legal systems. Epstein's theoretical model has never been tested. I use the Polish experience to reinforce Epstein's model empirically with use of both qualitative evidence and regression analysis.

Early modern Poland was a confederation of various historical Lands (*ziemie*). These Lands had their own local elites and regional vested interests. These conflicted interests were articulated and negotiated on the central level of the state. After 1505 all laws binding the whole country had to be made by Sejm (Polish Parliament). Sejm was composed of the King, Senate, and Great Diet (Polish House of Commons). The Great Diet was composed of the delegates of the regional Dietines representing the Lands. The decisions of the Parliament had to be unanimous. The system relied on consensus between the Lands brokered by the King. In the sixteenth century Sejm was very active and introduced numerous laws that unified measures and currencies across the country. The Sejm was in crisis in the seventeenth and eighteenth centuries when powerful oligarchs/magnates used the rule of unanimity to obstruct the parliament in order to protect their regional vested interests. Political crisis resulted in a shift of provision of public goods and state capacity from the central to the local level. This shift happened in the age of political centralization under strong absolutistic rulers in the other countries located in Eastern and Central Europe. The political crisis led to graduate partitions of the country by Prussia, Russia and Austria that began in 1772.

This paper uses the Polish experience to identify the effect of state formation on market development. Following van Zanden, Buring, and Bosker (2012) who studied state formation in England by looking at the number of days Parliament was in session, I construct a comparable new database of parliamentarian activity in Poland. I employ regression analysis to test if the existence of central regulation and longitude of parliamentarian proceedings had a statistically significant effect on lowering transaction costs in the country. I do that by linking Sejm's activity to annual rye price gaps between seven Polish cities. I construct a panel of 15 different city pair price gaps and regress it on parliamentarian activity and a range of control variables. The effect is also identified if I use the same model to analyse all the pairs of cities separately and test if the identified effects are jointly significant. I also investigate the impact of the Polish parliament by linking it to the CV of all the prices. Lastly, I employ a placebo test by adding a range of cities located in the Holy Roman Empire (Germany). I find that the Polish parliament had an effect only on cities located within Poland. I find that Sejm had a strong effect on lowering transaction costs in the short term. The Polish domestic commodity market was more integrated in the period of political centralization in the sixteenth century. While it disintegrated in the period of political segmentation in the seventeenth and eighteenth centuries. Poland followed a different

development path to Western European countries, which continued to develop their domestic markets in the eighteenth century. The Polish fragmentation crisis is vital because it resulted in strengthening of serfdom in the country (Malinowski 2016). Differences in political development could explain the origins of the Little Divergence between the East and West of Europe.

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Mats Olsson & Patrick Svensson (Lund University)

Storage and speculation in Sweden during the early modern commercial revolution

From the grain surplus regions in southern Sweden grain was shipped to other parts of Sweden during the eighteenth century and, with increasing quantities produced during the agricultural revolution, also abroad to markets in the Netherlands and England. This paper sets out to map and analyse storage practices among farmers and merchants during a period of rapid commercialization. Can we detect speculative behaviour or did the groups merely store grains as long as was necessary for practical and logistic reasons?

The study rests upon unique sources on micro-level for the potential storage keepers and on monthly grain prices from all Swedish towns. We focus on deliveries to and shipments from Malmö 1796–1810 and by using several thousands of individual excise notes, issued every time a carriage with grain passed the town wall, we are estimating the average time the farmer actually stored grain from harvest to delivery to a merchant. Following this dating and using shipment records we are also able to calculate the time grain was stored at the merchant houses in the town. Finally, we use the detailed monthly price series, not only from Malmö but from the grain-importing towns, to detect patterns of speculation.

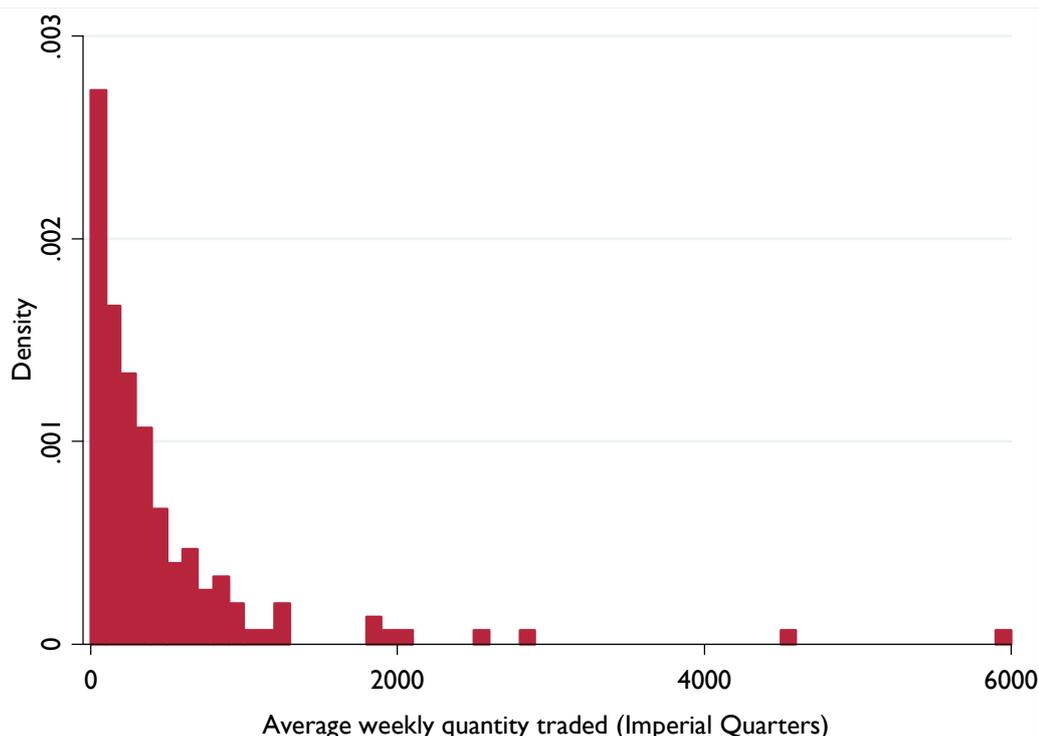
The paper provides a complete chain from the farmer's barn to export in terms of storage and organization of trade during a phase of increased commercialization in Europe. Preliminary results show that both farmers and merchants often stored grain longer than necessary, whether this was due to speculation will be analysed in the version presented.

Edmund Cannon (University of Bristol) & **Liam Brunt** (Norges Handelshøyskole)

Integration in the English and Welsh wheat markets, 1828-42

We analyse *London Gazette* weekly wheat prices in 150 English and Welsh markets for the period 1828-42. Most importantly, we also have data on the quantity of wheat traded, which allow us to study the effect of market size on price behaviour. Although there have been many studies of prices, we know of hardly any that look at the effect of market size.

The range of market sizes is large and heavily skewed. London saw average weekly quantity traded of just under 5,904 Quarters, twice as large as every other market except Wakefield (4,567 Quarters): the vast majority of markets had weekly average trade of less than a thousand Quarters.



This raises the obvious question of how observed prices behave in markets of very different sizes. We find that both the long-run and the short-run elasticity of prices with respect to quantity trade are negative. To measure the long-run elasticity we analyse the harvest-year-averaged price and quantity for each market (i.e. we take the weekly data and average within harvest year).

The average price of wheat is lower in larger markets, with an estimated elasticity of -0.011 (statistically significant: $p = 0.004$). This is sufficient for market size to explain almost a quarter of the variation in prices between markets during this period. There is also some evidence that markets with larger-than-expected trade in a given year experience lower prices, but this is statistically insignificant.

We also analyse the very short-run elasticity by de-trending the weekly data: we analyse deviations of price and quantity from five-week moving averages. There is substantial variation in the relationship between these prices and quantities, but on average the short-run elasticity is -0.08 .

Neither of these elasticities tells us anything directly about supply or demand, since we have no identifying assumptions to separate the two relationships. However, since lower prices were associated with larger markets, this suggests that larger markets were more efficient.

The weekly variability of prices is also lower in larger markets, with an estimated elasticity of -0.002 (statistically significant: $p\text{-value} = 0.003$). This elasticity is enough to explain about a quarter of the cross-section variation in price variability in different markets; furthermore the variation in market size over time is sufficient to explain about a fifth in the annual variation in weekly price variability.

An additional result is that price variability within a market is associated with lower average prices, whether or not one also conditions on market size. It is difficult to interpret this result because observed prices may be contaminated due to sampling error arising from unobserved quality variation, as described by Brunt and Cannon in *Explorations in Economic History* (2015). However, prima facie it appears that the suppliers to the markets, i.e. farmers, would be worse off in markets with both lower and more variable prices, suggesting that they were not completely able to choose markets to maximize their utility. This suggests that some

buyers in the markets (i.e. corn merchants) may have had a degree of market power or that farmers were unable to arbitrage between competing markets.

A direct consequence of these results is that multivariate analyses of prices (e.g. tests of the law of one price or market efficiency) may be related to market-size effects, although in a more subtle way than first suggested by Ravallion in the *American Journal of Agricultural Economics* (1987). To quantify this effect we estimate bi-variate VECM and TVECM models of the kind that are widely used in published papers in economics and economic history and then compare the observed price behaviour with market size.

An initial observation from VECM analysis is that prices in smaller markets tend to follow prices in larger markets (which is consistent with Ravallion): price changes in larger markets tend to be more permanent and result in consequent adjustments in prices in smaller markets; price changes in smaller markets tend to be reversed and have little long-run effect on either market. However, the interpretation of this is complicated by the fact that the correlation of contemporaneous price changes in both markets is also related to market size, suggesting that prices in larger markets adjust even more quickly than can be observed on weekly data.

More sophisticated models assume that prices only adjust when they are sufficiently far apart (the price gap is above a “threshold”). Estimated thresholds are often assumed to be due to transport costs between markets. However, we also show that market size is correlated with the magnitude of thresholds and that this is also true when we compare markets that are very close together and hence where transport costs are low. This suggests that the adjustment towards price equilibrium is also affected by market size and not just transport costs, or that arbitrage costs are themselves affected by market size.

Keywords: market integration; grain markets; England and Wales; prices; error correction models.

II/E History & Policy Brexit Panel

David Thackeray (University of Exeter)

From losing an empire to leaving Europe: considering Brexit in the context of the British public's relations with the EEC, 1961-75

On referendum day, the 52-year old Nigel Farage expressed his satisfaction with being able to vote on the matter of Britain's membership of the EU for the first time. Brexiters like Farage have long claimed that EEC/EU membership lacked a democratic mandate. However, public opinion surveys in the 1960s and 1970s suggested there was significant public enthusiasm for British membership of the EEC. This paper considers why issues which had been important in Britain's applications to join the EEC, and the subsequent 1975 referendum on membership, did not play a significant role in the 2016 campaign. Moreover, it also considers the ways in which these historical perspectives can inform current debates on Brexit.

Jim Tomlinson (University of Glasgow)

Globalization and Brexit

In a recent lecture the Managing Director of the International Monetary Fund, Christine Lagarde, outlined the emerging conventional wisdom on the Brexit referendum – that the result represented a negative response to globalization as experienced by large sections of the populations of the wealthier nations (Sylvia Ostry lecture, 'Reshaping the globalization debate' – September, 2016). This paper explores whether this is an accurate and useful way of understanding the vote for Brexit.

Adrian Williamson

Brexit and the decline of social democracy

The vote to leave the EU has been largely explained as a response to increased immigration and fears over economic insecurity. These accounts have obvious attractions. However, there is also a wider political and social context to Brexit. The UK, always an 'awkward partner' in the European project, showed most enthusiasm for Europe when social democracy and its paler shadow, Christian democracy, flourished. In this period, roughly from the late 1950s to the early 1980s, domestic policy was broadly favourable to social democracy. Alternative voices – socialist on the Left and nationalist on the Right – were marginalized. Since the 1980s, Christian democracy, with its emphasis on social solidarity and international cooperation, has attracted little support on the political Right, which has, in turn, shown little zeal for promoting the UK's role in Europe. In the same period, social democracy has been advanced only with hesitation on the Left, which has preferred to make a Faustian pact with Thatcherism – indulgence of the City, in the hope that there would be some trickle down to those 'left behind'. This pact unwound in the light of the financial crisis of 2008, leaving the way clear for socialists, always distrustful of the European capitalist club, to reclaim leadership of the Left. The UK therefore entered the referendum campaign with social democracy very much in retreat, save in Scotland. These conditions were highly unfavourable to a vote to remain.

II/F Women and Entrepreneurship

Anne Laurence (Open University)

Mrs Bonnell (1660s-1745) and the Widow's Might

Historians tend to characterize early modern widows in one of two ways: either as wealthy women freed from the constraints of coverture, or as constituting the largest group of the poor. But there were many widows who were neither especially wealthy nor desperately poor. For them, managing their resources meant learning new skills of financial management at a time when they often had young families to look after. In reality widows had simply to deal with the circumstances in which they found themselves, often with little warning and at a young age and with young children.

Jane Bonnell, from the Scottish-Irish Conyngham family, was married to James Bonnell, accountant general of Ireland. In 1699 he died. Only one of the couple's three children survived their father and she died soon after him. Bonnell had not been a wealthy man and had been noteworthy before his marriage for giving away an eighth of his £300 salary every year. His widow then became dependent on her natal family for support: her brother arranged a mortgage for her which was to provide her with an income. For much of her adult life she was in contention with her nephews to secure the income that had been settled on her. She became increasingly reliant on remittances from her wealthy sister Katherine Conolly. Having settled in England, Mrs Bonnell had to manage not only the differential exchange rate between England and Ireland but differences in the interest rate and features of the Irish economy such as shortage of specie and the underdevelopment of Irish banks. A large number of payments from Ireland came not through banks but through Dublin merchants. In England she carried out errands for her Irish relatives and for a few English friends. In particular she advised, and in some cases managed, their purchases of lottery tickets and their ventures into the stock market, especially the purchase of South Sea Company shares in 1720. These activities provided her with occupation though it is not clear how they helped her finances.

This is a study of how a widow with resources, but not great wealth, managed during her 46-year widowhood. It is also a study of how a private individual organized her business affairs in both England and Ireland. Far from benefiting from the freedom from coverture, Mrs Bonnell was as financially dependent as a widow as she had been when a wife, partly because of the refusal of her nephews to pay her the income settled on her. As a friend of the Hoare banking family she had their advice but, as with many of the other private customers of the bank, by no means all her financial transactions took place through her account.

Much of the work on how business was carried out between Britain and Ireland is concerned with merchants who traded on both sides of the Irish Sea and with English landlords managing estates in Ireland. But there were many hundreds of individuals – clergy, royal officials, smaller landowners – who had assets in both England and Ireland. This is a study of how one of these individuals negotiated the difficulties. It has perhaps contemporary resonances as Britain and Ireland have to renegotiate their financial relationship in the light of Brexit.

Keywords: early modern women; widows; Anglo-Irish finance.

Carry van Lieshout (University of Cambridge)

Female entrepreneurship in England and Wales, 1851-1911

The role of women as business owners in Victorian Britain is increasingly recognized (Barker 2007, Kay 2009, Craig 2016). However, the majority of research has been focused on case studies of particular localities, industries such as textiles, or on large businesses. This paper provides a wider overview of female entrepreneurship in England and Wales based on census data between 1851 and 1911. Using the Integrated Census Microdata (I-CeM) dataset, a big-data analysis allows us to identify the full business population of England and Wales, meaning that for the first time it is possible to analyse not only the larger firms but also the small and medium sized businesses that comprised the majority of enterprise. By focusing on the female owners of these businesses, this paper presents a comprehensive overview of the participation of women as employers, partners, and sole proprietors in a period of rapid industrialization, declining agriculture and the increasing gendering of occupational roles.

The paper's main focus is an examination of the numbers of female entrepreneurs engaged in business of various sizes over time. Their proportion of the population and their relative importance compared to male entrepreneurship rates are mapped in order to identify emerging and declining concentrations of female-owned businesses by geography and by sector.

In addition, the paper focuses on the role of lifecycle in female entrepreneurship. Preliminary analysis of the 1881 data only (Bennett 2016; Bennett and Newton 2015) has shown the importance of age and marital status for the ability of women to access business ownership. By analysing the population of female entrepreneurs by age, marital status, and household structure over time, the paper probes the impact of the 1882 Married Women's Property Act on women's participation in business ownership.

Jennifer Aston (University of Hull)

Financing female enterprise: businesswomen and finance in London, 1880-1910

There has been a substantial increase in studies examining the economic agency of women in eighteenth and nineteenth-century Britain, with particular attention paid to the way women were able to negotiate areas traditionally understood to be part of the masculine public sphere such as business ownership and financial investments.⁵⁸⁸ This research has demonstrated that women were able to operate using an identity that superseded their gender, enabling them to confidently construct, and actively demonstrate, economic agency. Similarly, research into the experiences of female business owners and bankruptcy procedures in late Victorian and Edwardian England reveals that although widows were perceived by creditors to be a bigger risk, female traders were in fact no more likely to fail than their male counterparts.⁵⁸⁹

What has yet to be fully explored is the way that women in the late nineteenth and early twentieth centuries financed their enterprises. Were they almost entirely reliant on inheritance, and familial and friendship networks? Or were they able to access more formal sources of credit available to male business owners, for example banks or credit unions? The primary reason for this gap in the historiography is arguably the scarcity of source material about small businesses, particularly those owned by women. However, the Board of Trade Official Receivers Reports (BOTORR) offer a unique window into the lives of female business owners in early twentieth-century London, detailing who they had borrowed money from, how much they borrowed, and ultimately, why they failed to pay it back.

This paper uses the BOTORR of 57 female business owners who traded in London, and whose cases came to the attention of the bankruptcy courts between 1900 and 1908, to examine the ways that women were able to finance the establishment, operation, and possible

⁵⁸⁸ Barker (2006), Phillips (2006), Kay (2009), Aston (2016); Green (2003), Maltby & Rutterford (2006), Green et al. (2011).

⁵⁸⁹ Aston and Di Martino (2016).

expansion of their firms. It is acknowledged that the microstudy that emerges from these 57 case files cannot be held to be representative of a wider population, both in terms of geographical location of the cases (only the files of London cases survived), and also the fact that all of these female owned firms failed; yet this latter point is also one of the sample's strengths. Evidence from the BOTORR suggests that people would do everything in their power to avoid bankruptcy, and therefore the different credit streams seen in the BOTORR should illustrate almost the full range of options available. Quantitative analysis of the BOTORR reveals the amount and source of credit, often the interest rate, and the geographical spread of borrowing, while qualitative analysis places this borrowing in the context of the businesswoman's wider financial portfolio. The questionnaire section of the BOTORR then provides an explanation – uniquely, in the business owner's own words – of their relationship with their creditors, and how the borrowing fitted into their broader financial strategy.

The information contained within the BOTORR therefore reveals a partial picture of credit and financing from the female business owner's perspective, and how the business community responded to their financial failure. The BOTORR cannot however, shed light on the way that women in business were viewed when they initially applied for credit, or reveal how the gender of a business owner might have affected the financial institution's assessment of their credit-worthiness and therefore the likelihood of a credit application being approved. In order to address this, attention will turn to the Character Books of the Birmingham Horsefair branch of the *National Provincial Bank of England Ltd 1887 – 1914*⁵⁹⁰. Character Books were compiled by the Bank Manager of each individual branch and were quite literally reports on the characters of all the people who applied to that particular branch for credit. Character Books have previously been used to demonstrate that creditworthiness was not as prescriptive as might be imagined,⁵⁹¹ (a point that might prove to be especially important to female borrowers), but as yet there has been no explicit examination of the perception and treatment of female business owners seeking credit on their own account. Although Character Books exist for a number of provincial and metropolitan banks, the records of the Birmingham Horsefair branch of the *National Provincial Bank of England Ltd 1887 – 1914* have been selected as the data contained within them can be cross-referenced with a database of female business owners operating in the city between 1850 and 1901, thus allowing detailed qualitative case studies to be created, and the context of female borrowing in a large manufacturing city to be understood.

Use of the BOTORR and National Provincial Bank Character Books in this way is an innovative attempt to uncover more information about *how* women in nineteenth-century England operated their businesses, the different ways that they were able to access credit, whether they faced institutional bias, and if so, whether they were able to circumvent this. The experiences of the female business owners found in the BOTORR and National Provincial Bank Character Books can then be compared to those of male business owners in order to determine whether the opportunities and management behaviours of men and women differed significantly; an area that to a large extent remains unexplored.

Keywords: business; finance; credit; women; gender; banking.

⁵⁹⁰ Character book of Birmingham Horsefair branch of National Provincial Bank of England Ltd, RBS Archive, NW/B1092/1/1-2.

⁵⁹¹ Newton (2000).

II/G Finance in Latin America

Luis Zegarra (Pontificia Universidad Católica del Perú)

Usury laws and private credit in Lima, Peru: Evidence from archival records

Usury laws have received much attention from the literature. Some studies have focused on the political economy of usury laws. Interest restrictions can be the outcome of public and private interests. In an article of 2009, for example, Jared Rubin pointed out socially efficient reasons for the Church to impose interest restrictions; whereas Efraim Benmelech and Tobias Moskowitz show in 2010 that political and economic factors can explain the imposition of usury laws in some US states in the nineteenth century. Other studies have focused on the effects of usury laws. Howard Bodenhorn in 2007 and Peter Temin and Hans-Joachim Voth in 2008, for example, showed that usury laws led to changes in the allocation of loans. Small risky borrowers, for example, were rationed due to interest restrictions.

Our study discusses the political economy of usury laws in Peru, and analyses the impact of interest restrictions on the allocation of credit in 1825-52. Although Peru achieved independence in 1821, ten years later credit operations were still subject to colonial usury legislation. Congress then repealed colonial usury laws in 1833. In the following years, interest restrictions were again imposed until a definite repeal in 1838. By looking at almost 2,000 notarized loans and tax records from the National Archives of Lima, this article shows that small borrowers were rationed due to usury laws. Also, loans tended to be shorter due to interest restrictions, as lenders attempted to economize on risk. As usury laws were repealed in the 1830s, the supply of credit expanded, especially for the non-elite.

This study constitutes a contribution to the literature on financial development for several reasons. First, no other study has focused on the impact of usury laws on early credit markets in Latin America. Also, as this study analyses differences in access to credit, it contributes to our understanding of inequality in Latin America in the early nineteenth century. Finally, the study relies on notarized loans, which have not been frequently used to test the impact of usury laws or Latin American credit markets in general, and on tax records which have not been used to study access to credit.

This study contributes to our understanding of the role of institutions on credit markets and, in particular, on the democratization of credit. The evidence is consistent with other studies that also show that institutions and, in particular, interest restrictions play an important role in the allocation of credit. If one intends to understand the financial backwardness and the inequality in the access to credit in Peru – and in many other countries in the region – it seems that one would gain much from paying special attention to institutions and, especially, usury laws.

Gonzalo Islas, Matias Braun & Ignacio Briones (Universidad Adolfo Ibáñez)

Financial development and business networks during early industrialization: Chile in the Americas' context

Through easing financial constraints, the development of financial systems has been shown to have a major effect on the behaviour and performance of firms, and economic growth in general. The alternative mechanisms agents use when banks or markets do not provide adequate financing have been less researched, though. Corporate networks may serve as a device for enforcing contracts when formal institutions do not work properly. In particular, establishing links with banks may allow financiers to provide funds to firms in an environment where the legal protection of creditors is weak or not sufficiently enforced.

Based on novel primary source data, we document the main features of linkages between corporations in early twentieth century Chile, a small open economy, with little state intervention and without significant restrictions on corporate governance. For 252 firms, we collect the name of all board members in every company, totalling 1,873 seats and 1,198 unique directors. Basic financial information and stock market prices are collected when

available. Further stock market data and ownership data were obtained from the Anuario Estadístico of the National Statistics Office and newspapers, and the corporations' annual reports, respectively.

We characterize the Chilean Corporate network using interlocking directorates' analysis. Our contribution is twofold. On the one hand, we compare the shape of Chile's network and the centrality of banks to those of Brazil's and Mexico's at the same time, thus extending our understanding of the impact of the institutional settings and availability of external financing in the conformation of corporate networks as stated by previous historical literature for Latin America. On the other hand, based on our collected financial data, we explore the economic effects networks have.

We show that Chile's network was denser and its banks more central than in Brazil but less so than in Mexico. We find that firms that were well connected, especially with banks, had easier access to credit, were able to command higher valuations in the market and had a higher probability of survival. Our results are consistent with the hypothesis of networks acting as an endogenous business device for counteracting financial limitations, particularly in a context without relevant restrictions to interlocking directorates, or to banks doing business with related firms. These facts are consistent with the hypothesis that the network structure helped ease the financial constraints when bank credit was scarce and there were not good substitutes.

Andrea Papadia (London School of Economics)

The historical origins of local fiscal capacity in Brazil

This paper contributes to the literature on the origins of fiscal institutions by studying the evolution of fiscal capacity in Brazilian states and municipalities from the nineteenth century until today. Brazil's relatively poor economic performance has been linked to the state's weakness and its insufficient provision of public goods. There is ample evidence that low public spending acted as a constraint for growth due to the suboptimal provision of infrastructure and education, already in the nineteenth century. At the same time these effects have been deeply uneven across the country.

Although research on fiscal capacity is a burgeoning field, little is still known about the formation of fiscal institutions outside Europe, particularly at the sub-national level (Hoffman, 2015; Koyama and Johnson, 2016). Whereas in Europe frequent outbreaks of armed conflicts throughout history have provided the stimulus for the creation of strong fiscal states and the expansion of modern forms taxation, no comparable developments took place in many other parts of the world, including Latin America (Centeno, 2002). At the same time, differences in fiscal development between and within Latin American nations are large. Brazil, for example, is characterized by substantial intra and inter-regional differences in economic outcomes such as income and inequality, as well as in the quality of governance. It is necessary to go beyond the warfare-state-formation nexus in order to understand these differences.

In contrast to an older literature suggesting that regional differences originated in the colonial period (Engerman and Sokoloff, 1997), recent studies focus on the Republican period of 1889-1930. According to these, the 1891 Constitution, which devolved the power of collecting export tax revenues to the states, combined with the export boom of the late nineteenth / early twentieth century, allowed some states to substantially increase their revenues and invest them in public goods such as education (Martínez Fritscher, 2011; Martínez Fritscher, Musacchio, and Viarengo, 2014).

In the paper, I incorporate an understudied, but crucial phase in Brazilian history: the monarchic period that went from independence in 1822 to the military coup of November 1889. This period features the first fifty years of the commodity boom fuelled by coffee production, as well as deep structural transformations driven by the construction of the railway network, mass immigration and the exploitation of virgin land.

I first show some trends in the fiscal capacity in Brazilian states from the nineteenth century until the eve of World War II. I illustrate the evolution and composition of revenues and expenditures and relate these to prosperity today.

I then concentrate on the municipalities of the states of Rio de Janeiro and São Paulo to investigate the causal factors behind the differential evolution of fiscal capacity. In particular, I focus on the incidence of slavery and ethnic composition starting from the work of Lieberman (2003) who argues that, in Brazil, the formal rejection of racial discrimination – which was, instead, perpetrated informally – made white elites more prone to resist the pooling of resources through taxation. This stands in contrast to South Africa where, he argues, the institutionalization of racism made elites more willing to be taxed.

I show that developments taking place during the monarchic period did indeed lead to large differences in the structure of local fiscal institutions. These developments were driven by stark differences in the context in which the coffee boom took place compared to the earlier sugar boom. Sugar was produced predominantly in the northeast of the country and had its peak in the colonial era, while coffee production exploded in the southeast starting from the 1830s. The main difference between the two booms is that, while the former took place during the heyday of the Atlantic Slave Trade, the latter took place as slavery was waning and was eventually abolished. International pressure, particularly from Britain, made the slave trade increasingly difficult, until its abolition in the 1850s. Slavery itself persisted until 1888.

These circumstances led to a deeply different composition of the population across and within different regions of Brazil. Although there was a partial reallocation of slaves to the coffee-growing regions, the rapidly expanding coffee plantations had to rely on other forms of labour. Eventually, this led to the subsidization of immigration from Europe and the inflow of vast numbers of new workers in the second half of the nineteenth century. The exploitation of virgin territory for coffee production also meant that new elites, not tied to traditional oligarchies, had the opportunity to emerge. These factors point to the creation of more inclusive institutions and more mutualization of resources through taxation.

I argue that these institutions persisted and that their importance increased as local governments gained prominence. This first happened with the more federalist 1891 Constitution. The end of the military dictatorship and the drawing up of a new constitution in 1988 provided a new boost to the role of municipalities by devolving further administrative and fiscal powers to these entities, making them key players in today's administrative landscape in Brazil.

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II/H Migration

Alexander Klein (University of Kent) & **Jelle van Lottum** (Huygens Institute for the History of the Netherlands, Royal Netherlands Academy of Arts and Sciences)

The determinants of international migration in early modern Europe: The maritime sector, c.1700-1800

In this paper we will adopt a multivariate analysis to analyse the key determinants of international labour migration in the eighteenth century European maritime sector.

Migration was a common feature of pre-industrial societies. In most cases this involved moves over relatively short distances; the vast majority of migrations took place within the confines of a country, a province or even a parish. Long-distance migrations, i.e. migrations covering a hundred kilometres or more, and which often involved entering foreign territories were, however, anything but rare. Recent estimates show that international mobility levels increased strongly after the medieval period, peaking in the late seventeenth century. In the latter half of the seventeenth century around 8 per cent of the entire European population (Russia excluded) could be considered an international migrant. Only with the mass migrations to the New World in the nineteenth century were these numbers surpassed.

In the past, studies on early modern international migration have focused in particular on two groups: refugees and elite migrant groups (or individuals). In recent years, however, the international migrations of ‘common men and women’ in pre-industrial Europe have received increased attention. Insights have been gained in the processes of integration, the mapping of key migration routes on the continent, and in the last decade research has also yielded more refined assessments of pre-industrial migration rates. In this paper we will, however, focus on a different aspect: the drivers behind international labour migration. This is a central theme in studies on nineteenth century migration but one that received considerably less attention in studies on international migration in the early modern period.

To shed light on this hitherto underexplored topic in the economic history of pre-industrial Europe in this paper we will focus on international migration of maritime workers. The shipping sector played a crucial role in the pre-industrial European economy, which by the eighteenth century was still largely governed by Smithian principles of growth, driven by processes of specialization and commercialization and in which international transport played a crucial role. It is also a relatively data-rich sector of the early modern economy. In our analysis we use unique eighteenth-century data stemming from the maritime sector. This will allow us to examine the role of geographic-, population-, linguistic-, market-, chain migration, and political factors in explaining migration of seamen across countries.

Melinda Miller (University of Michigan)

Assimilation and economic performance: The case of US Indian Policy

Throughout the nineteenth century, Federal Indian policy oscillated between two extreme positions. George Washington and his immediate successors endorsed a programme of “civilization.” Federal Indian agents proffered rights to permanent settlements, domestic animals, household tools, and instruction in husbandry with the eventual goal of assimilating tribes into the burgeoning agricultural society of the newly united states. However, the inexorable westward movement of the frontier, the accompanying desire for new farm lands, and the discovery of valuable resources within tribal territories contributed to a growing white resentment of Indian land title. With the passage of the 1830 Indian Relocation Act, Andrew Jackson orchestrated the wholesale abandonment of civilization programmes and instead became an avid proponent of removal. Eastern tribes were to be relocated (forcefully, if necessary) to uninhabited land west of the Mississippi River. Their territories were then opened to white settlement. Isolation on reservations was the predominant philosophy until 1887 when Congress passed the General Allotment Act. More commonly known as the Dawes Act, it marked yet another dramatic shift in Indian policy and a return to past practices

of assimilation and civilization. The Act called for all Indian lands to be allotted to individual Indians in severalty. Supporters believed land ownership would encourage Indians to adopt a settled agricultural lifestyle.

While scholars have often been interested in the impact of Federal policy on current levels of economic development among Indian tribes, none have explicitly examined the influence of Federal assimilation policy on the long run economic development. In this paper, I take advantage of tribal-level variation in the application of Federal policies to estimate the effect of assimilation on long run economic performance. To quantify the impact of such policies on tribal-level assimilation, I introduce a novel measure of assimilation: the relative prevalence of traditional Indian versus European-influenced names. To calculate the distribution of name types, I have gathered the names and locations for the approximately 260,000 American Indians enumerated in the 1900 United States Census. I then calculate a tribal area specific fraction of European names as a measure of assimilation in 1900. Utilizing the 2011 American Community Survey, I estimate the relationship between assimilation in 1900 and a variety of measures of economic development in 2011. I find that 1900 levels of assimilation impact levels of reservation income today. The pattern follows an inverted “U” shape, with higher levels of assimilation leading to initially higher levels of income. Eventually, however, the effect diminishes.

Vellore Arthi (University of Essex), **Brian Beach** (College of William & Mary) & **Walker Hanlon** (UCLA)

Examining the recession-mortality relationship when migration matters: Evidence from the Lancashire cotton famine

Are recessions good for health? A large literature, following Ruhm (2000), addresses this question by applying a fixed effects approach across areas, such as US states, experiencing differential recession effects. This literature, which has focused primarily on modern developed-country settings, suggests that recessions have beneficial effects on public health. However, an important assumption underlying this approach is that recessions either do not generate a substantial migratory response, or that this response is accurately reflected in intercensal population estimates. This methodological concern is relevant for the emerging literature which seeks to extend the Ruhm approach to new settings, such as developing countries, that are characterized by mobile populations, weak social safety nets, and poor intercensal population estimates. In this study, we illustrate this point by drawing on a historical setting, the Lancashire “Cotton Famine,” a recession in the cotton-textile producing areas of Britain caused by the US Civil War (1861-65), to provide evidence that migration-induced bias can substantially affect estimates of the recession-mortality relationship. Specifically, out-migration from recession-stricken regions may lead to the spurious impression that recessions are good for health. We digitize detailed annual age- and cause-specific mortality data at the district level for the period 1851-70, and combine this with information on occupational structure and other demographic measures. Using this new panel data, we propose a methodology for identifying and dealing with this bias based on examining mortality patterns in the destination locations favoured by migrants during the recession. Applying this methodology to our historical setting indicates that the overall mortality effect of the Civil War-induced recession was close to zero, but that this was due to mortality reductions among infants that were offset by rising death rates among the elderly.

III/A Economic Shocks and Risk in Medieval Europe

Tony Moore & Miriam Marra (University of Reading)

Default rates and credit risk factors in medieval England: Evidence from the London recognisance rolls, 1285-1317

A fundamental question facing any would-be lender is simply: will the borrower pay me back? If the chances of default were believed to be high, then either the lender would have to increase the interest rate charged to compensate for this credit risk or else not lend at all. Indeed, scattered evidence suggests that private interest rates in medieval England were in the order of 15-25 per cent per annum and could be even higher. This has been variously attributed to the cost of capital, the usury prohibition, the illiquidity of thin credit markets and difficulties in enforcing debt agreements. However, the underlying role that high default rates may have played has not been studied directly, largely because of the lack of data suitable for quantitative analysis.

One exception is the statute merchant system established by Edward I in 1283. This allowed credit transactions to be registered in recognisance rolls kept at major towns; in case of default, the creditor could request a certificate of the debt to be sent to the royal chancery to initiate an expedited debt collection process. Unfortunately, almost all of the original recognisance rolls have been lost. However, over 35,000 certificates of execution survive in the National Archives today and have been used to study the operation of the private credit market in later medieval England. However, the certificates present an inherent methodological challenge as they represent only a (small) subset of all credit transactions. The use of the certificates to analyse the private credit market in cross-section assumes that the executed certificates are representative of the full sample of recognisances; and to reconstruct chronological patterns in credit issuance that the rate at which debts defaulted and were executed remained constant over time.

This paper tests both of these assumptions, taking advantage of a brief window between 1285 and 1317 for which there are nine surviving recognisance rolls from London (covering 12 years) in the London Metropolitan Archives. These record all the credit transactions that were registered during these years; by cross-referencing these against the certificates, it is possible to identify which went into default and were then executed. This will allow us to calculate the (minimum) rate of default on such recognisances and if this varied from year to year. It will then compare the characteristics of the sub-sample of executed certificates against the full sample of registered debts to investigate whether there were any factors that increased credit risk and if these changed during the period under study. In light of these findings, it will conclude by considering whether the executed certificates are a reliable guide to the medieval credit market and what implications might this have for their use as a historical source.

Philip Slavin (University of Kent)

The Great European Famine: the Irish experience, 1315-18

The terms 'famine' and 'Irish economic history' are, sadly, almost synonymous, largely because of the disaster of the infamous potato blight of 1845-52 and, to a lesser degree, because of the Great Frost Famine of 1740-2. In reality, however, there were a number of additional full-scale famines, which are yet to receive proper scholarly attention – including the Cromwellian Famine of 1649-54, the Plantation Famine of 1597-1601 and the Great Famine of the early Fourteenth Century (1315-18). Labelled here as the 'Bruce Famine', the disaster was initiated, just as elsewhere in northern Europe, by disastrous weather, but was aggravated primarily because of the ongoing warfare, in conjunction with the Scottish invasion of Edward Bruce and the chasing English armies, as well as civil strife among local chieftains.

Up until now, the Bruce Famine has not attracted any scholarly attention, with the exception of some en passant notes. This is largely due to the fact that the lion's share of medieval Irish documents were destroyed in the course of the Great Fire of 1922. Although there is no doubt that the fire proved to be disastrous, the darkness is still not impenetrable. In the course of my recent research in the National Archives of Dublin and the Representative Church Body of the Church of Ireland Archives, I have found a corpus of calendared material of medieval Irish Chancery rolls, copied in the late nineteenth century. In addition, there are surviving parish valuations for the early fourteenth century, recording the land assessment before and after the famine and war. On the basis of this corpus, it is possible to reconstruct the proportions of the famine and its impact on early fourteenth century Irish economy and society. A preliminary analysis suggests that the early fourteenth century famine had the most disastrous effect on Ireland and her population, to the point that it could have actually been the single worst famine in a recorded history of Ireland. Thus, the paper unearths yet another tragic, yet most meaningful episode in the economic and social history of Ireland, which is to be known in both a scholarly and public discourse.

Noel Johnson, Mark Koyama (George Mason University) & **Remi Jebwab** (George Washington University)

Economic shocks, inter-ethnic complementarities and the persecution of minorities: Evidence from the Black Death

The Black Death pogroms (1348-53) were among the largest persecutions against a minority group in premodern history. Minorities are often persecuted as scapegoats for negative shocks. However, the incentive to persecute a minority group also depends on patterns of economic complementarity and substitutability between the majority group and the minority group. We use the Black Death as a natural experiment to evaluate the importance of scapegoating and interethnic complementarities as mechanisms shaping the incentives to persecute Jewish communities at a local level. At a macro-level, the scapegoating hypothesis was highly relevant. However, cities which experienced more severe plague outbreaks were less likely to persecute their Jewish community. In particular, when comparing towns with a similar mortality rate, Jewish communities were most likely to avoid persecution in: (i) Towns where Jews had been recently allowed to settle (ii) Towns that reached a critically low population level in the immediate aftermath of the Black Death. and (iii) Cities that were connected to land-based trade networks. Conversely, Jews were more likely to be persecuted when the arrival of the plague coincided with Easter and in towns relying on sea-based trade or university towns.

III/B Leonard Schwarz: Work, Welfare and Wages in Early Modern England

The session will have a roundtable format with prepared and formal contributions from three economic historians who worked with Leonard Schwarz. These contributions will remind the audience of the range and depth of his contributions to economic history as well as provide a substantive academic session. These presentations will be fairly short, leaving time for members of the audience not only to ask questions but to add to our collective celebration of Len's life and work.

Jeremy Boulton (Newcastle University)

The eccentricities of welfare in Georgian London, or, London 'crises' and the parish workhouse, 1725-1824

This paper builds on the work of the late Leonard Schwarz by analysing the extent to which movements in real wages and other indices of welfare and hardship impacted on London's indoor poor. The paper therefore addresses one of the main themes of Leonard's classic 1992 book, *London in the Age of Industrialisation* (CUP, 1992). The paper is based on an analysis of the voluminous admission books of the huge workhouse of St Martin in the Fields, central to the Pauper Lives project which Leonard and myself began in 2004. It seeks to relate this data to the material Leonard used in his study of trade, war and economic cycles in the capital. The paper uncovers, as one might expect, a complex reality.

David Green (King's College London)

London poor and the London Poor Law: 150 years of poor relief in London

London in the Age of Industrialisation (CUP, 1992) was Leonard Schwarz's first monograph on London. It was a heroic task – covering economic trends, cycles, wars, mortality, migration, manufacturing, trade, wealth and poverty. It acknowledged the debt owed to Dorothy George and sought to build on that legacy by adding empirical evidence where it was needed and by re-interpreting the city's wider role in the economic change associated with industrialization. It was, more broadly, an effort to understand and unravel the complexity of the city not as a spectator to the industrial revolution but as a central component to the new industrial era. Leonard's last major project with Jeremy Boulton and others, focused on the eighteenth and early nineteenth-century London poor law, and this too bore similarities with his earlier work not just in relation to the period covered but also in terms of the attempt to understand complexity and place in the context of poor relief. Between the two is a wealth of other work in which the capital played host to Leonard's efforts. London remained very much at the core of Leonard's research and in this discussion I focus on what we can learn about the city and its place in the nation arising from a reading of his work.

Susannah Ottaway (Carleton College)

Workload and labour discipline in the eighteenth-century workhouse

From the time of the appearance of Eric Hobsbawm's 'Custom, Wages and Work-Load' and E.P. Thompson's classic 'Time, Work-Discipline and Industrial Capitalism' in 1967, historians of the long eighteenth century have been fascinated by the ways in which an industrializing economy altered not only workers' employment, but also their mentality, as they encountered new forms of labour discipline and developed new relationships to time. In his 2007 *Past & Present* article, Leonard Schwarz took Hobsbawm and Thompson's insights in a new direction, asking in relation to changing notions of custom, wages and workload during industrialization, "If time was money, how was this measured?" In answering this question, Schwarz put a distinct spin on the topic, examining the nature of piece-rate payments, the indirect relationship between effort and reward among servants and

apprentices, and suggesting that those who received poor relief may have had a different attitude towards time because their income was not necessarily derived from their work.

This paper will carry Schwarz's enquiry into a new location: the workhouse under the Old Poor Law. A study of labour in the workhouse in the eighteenth century allows us to explore simultaneously two of the areas in which Leonard Schwarz's work has been so important: his multifaceted histories of labour and employment, and his burgeoning interest in the institution of the workhouse. The paper begins with a brief overview of the increased use of workhouses across the eighteenth century, using data from Parliamentary Inquiries and other published sources. Visualizing this data in maps allows us to see particularly clearly the distinct regional patterns of the development of these institutions. Next, we will ask if the move towards the institutionalization of the poor signalled greater work and time discipline for inmates, as one might expect. Was the work done in the workhouse according to a strict timetable? Was it productive labour, or was its purpose primarily to inculcate labour discipline in the inmates? I will examine particularly, within the workhouse, what was the attitude towards piece work vs. timed work? Were such attitudes consistent across regions in ways that belie our general sense of regional variations in the development of both labour discipline and the practices of poor relief?

This essay addresses these issues by sharing the results of a detailed analysis of work performed in the Norfolk Houses of Industry for the Hundreds of Forehoe and Mitford and Launditch, and in smaller workhouses to the north, like those at Leeds and Ovenden. The paper then briefly sets the practices of these locations in a wider, comparative context using published sources and parliamentary reports from the period, as well as drawing on the wealth of research that has been produced on the Old Poor Law in recent decades. While variation in the work regimes of workhouses is very clear, the paper concludes that the workhouses examined here were intently focused on the production of specific quotas related to textile production, combining piece-work and time discipline in a distinct fashion. Because nearly all workhouses regulated their inmates by adhering to a daily schedule, reinforced by the hourly ringing of a bell, such work would have been carried out in a setting that instilled a close attention to the allotment of specific blocks of time for discrete tasks.

Using systems of 'reward money' and focusing on the inculcation of particular skills (including specialized agricultural tasks and shoe-making) as well as generic labour discipline, houses of industry took very seriously the need to shape poor children, particularly, into productive labourers, artisans and textile workers. Workhouses also played a key role in apprenticing youth, essentially serving as clearing houses for poor children who would be admitted briefly and then matched up with a master, taking with them clothing from the workhouse stores, and often new skills as well. Inmates were producing work of material value for their parishes, but they were also receiving significant benefits, not merely in the form of housing, food and clothing, but also in small monetary payments and in directly marketable skills and contacts to employers, as well as subsidized wages for those who went out to work during the day.

Taking seriously the workhouse as a site of textile production and training, and as a major locus for pauper apprenticeship, in turn, can alter the way the institutions as a whole are viewed, forcing us to see the ways in which the workhouse could be integrally tied to the local economy and could function within the complex system of exchange entitlements that characterized the period. We can then return to view from a new angle Leonard Schwarz's insistence that: "To understand the world of the English wage earner we need to see the relationship of monetary to non-monetary entitlements, and all the entitlements in relation to other institutions such as the Poor Law, the legal and political structures of employment and subordination, the interplay of custom and the market, the location of waged labour within households and its division between age and gender, as well as how these impacted upon other perceptions, such as those concerning the relationship between time, effort, reward and leisure".

III/C Infrastructure

Xavier Duran (Universidad de los Andes)

Why not using the wheel? Evidence from the Cambao wagon road in Colombia during the nineteenth century

In Europe and North America adoption and improvement of wagon roads led to transport productivity gains and positive externalities on the rest of the economy, during the seventeenth-eighteenth centuries. In contrast, modern Colombia, Ecuador, Peru and Bolivia, all on the Andes, used arrieria roads, similar to mule-pack roads, as the dominant inter-city transport mode even up until the early twentieth century. Arrieria roads do not use the wheel and slowed economic growth on the Andean highlands, where most people lived. Why were Andean countries late at adopting the wheel?

We examine the case of the Cambao wagon road in Colombia as a first step to shed light on this question. The Magdalena River connected Bogota, Colombia's capital and largest and richest settlement, with the rest of world. Yet, a wagon road climbing more than 2,000 MASL and connecting the Magdalena River with Bogota – the Cambao Road – was only completed in 1893. Extensive and unprecedented archival work on the Road allows examining three possible explanations for the slow adoption of wagon roads in the Andean Region.

We first consider the effect of geography on the timing of adoption. The Andes Mountains make it difficult and expensive to build roads. However, physical inspection of the remains of the Cambao Road with civil engineers indicates no major cuts, embankments, bridges or tunnels were required, and the slopes achieved were within the level acceptable by contemporary civil engineering handbooks. Rugged topography did not impose an unsurmountable barrier but increased wagon road construction costs and delayed its adoption.

Second, we study the role of transport demand on the timing of adoption. Using a threshold technology choice model calibrated using GPS data, ex-ante and ex-post construction costs, and mule energy transport costs with and without using wheels, we find that operating the wagon road was only profitable if traffic was higher than 2,600 tons per year. In fact, in 1860 traffic was 1,187 tons and by 1893 it had increased to 6,615 tons. Hence, it is likely at some point during the 1870s the wagon road became profitable. Rugged topography and low transport demand likely explain delayed adoption up to the 1870s, but not afterwards.

Third, we consider the role of politics. Private incentives to build and operate a wagon road were shaped by the government and legislature when deciding to grant the right of way to build the wagon road, regulate tolls, or grant the right of way to competing projects during a road's project lifetime. Government and construction company documents, press reports and personal papers suggest that during the Federal period, 1863-86, inter-regional political conflicts within the Cundinamarca State, where Bogota is located, led to a political deadlock that swamped wagon road construction projects. After Centralism was established in 1886, a strong government overcame the inter-regional conflicts and pushed forward the construction of the road.

The evidence examined suggests that the adoption of wagon roads on the Andes may have been delayed not only by its topography but by low transport demand and inter-regional conflicts.

Hanaan Marwah (London School of Economics)

Sub-Saharan African infrastructure financing and management: Evidence from Ghana electricity distribution, 1950-2015

From the 1950s Ghana's electricity sector has been a major success relative to other sub-Saharan African countries. Starting with the Volta River dam project in the 1960s, it built major hydroelectric power generation to support industrial growth and in the 1980s launched sub-Saharan Africa's first donor-funded widespread national electrification scheme. While the central role of infrastructure, or lack thereof, in economic growth in Africa has long been asserted, and debated, by development economists, infrastructure financing and management arrangements have received relatively little recent attention from African economic historians. While there is a considerable literature on some areas of colonial-era fixed capital investment, in particular railways, post-colonial infrastructure history has been largely written from a development perspective, or funded by multilateral institutions largely motivated by the desire to improve policy decisions and data analysis. This paper addresses this gap and uses the case study of electricity distribution in Ghana. It uses historical reports from the Electricity Company of Ghana (ECG), a public corporation set up in 1967 by the government of Ghana as to be the country's primary power distribution company. The paper looks in particular at financing and management arrangements for power distribution. It puts this in context of broader trends in Ghanaian economic and social history as well as other developments in the African infrastructure financing.

Florian Ploeckl (University of Adelaide)

National rules, regional differences? Explaining the regional provision and productivity of a public monopolist: The case of the German Reichspost

National public monopolies are usually charged with delivering the same service everywhere with the same conditions. This also held for the Postal services of the nineteenth century, the historical forerunner of such a national public service, when they spread out extensively under the idea of "Universal Access". Nevertheless, different regions received different levels of service provision and as Ploeckl (2016) demonstrates for the case of the German Imperial Reichspost the productive efficiency of the service differed as well. This project uses the case of the German Imperial service to investigate whether these differences in service provision and productivity are the result of exogenous factors, for example urbanization, geography or literacy, or endogenous reasons, for example political capture.

Between the Prussian-Austrian war in 1866 and the creation of the German Empire in 1871 the Prussian postal service assimilated the services of most other German states and became the Imperial Postal Service, organizationally located under the Empire's chancellor. Its monopoly was extended from postal services into telegraph and later telephone services, making it an integrated service provider not only of communication and information services but also financial and travel ones. While policy was set at the headquarters in Berlin practical operations were executed by about 40 postal districts, which roughly lined up with general administrative boundaries.

The service published detailed annual statistical information about various service aspects in the postal districts between 1890 and 1910. These include input factors like the number of employees, post boxes and offices, the number of telegraph stations or the length of telephone cables, as well as output numbers like the volume of mail delivered, the number of telegraphs received, or the number of phone line subscribers. These numbers will be used with a DEA analysis to derive a measure of relative productivity for each district. In a second step these productivity numbers will then be used as dependent variables. Adding a series of explanatory factors like urbanization, population density, geography, income, or literacy will then show how much of these productivity differences can be explained with district characteristics. Particular attention is paid to the influence of political variables to identify any political capture effects. These capture effects and the remaining productivity differences are

then used to identify what differences in service provision, like the number of post offices, are explained as an efficient adjustment to regional characteristics and how much are remaining regional inequalities. For a number of years also financial results, like the total expenses and revenues in a district, are available, which allows us to quantify the financial impact of these remaining differences.

Public monopolies are charged with providing the same service everywhere, so deviations from this are often seen as an indication for preferential treatment of particular regions. This project investigates which differences are the result of an efficient response to different circumstances and which are indeed regional favouritism or disadvantage.

III/D Rural Economy

İklil Selçuk (Özyeğin University)

A look at the economy of nineteenth-century Ottoman Mudanya region through olive and olive oil production

This paper mainly explores the question of the extent of nineteenth-century olive and olive-oil production in the Mudanya district of the Marmara Basin, which was a part of the Ottoman Empire. More specifically, this study enquires whether or not the most significant agricultural activity of the said region, olive production, was of subsistence or commercial nature. Mudanya was of significant stature and strategically located, providing the Ottoman capital, Istanbul, with produce from the fertile gardens of the Marmara region via its dock. It was, and still is, one of the main hubs of olive production in Anatolia. Records kept by the Ottoman bureaucracy in the nineteenth century proliferated and systematized further due to efforts of modernization. A reflection of such efforts, were records (Ottoman *temettuat*) of demographic, economic, fiscal and agricultural data on households, including their sources of wealth, estimates of taxes to be paid, and information on cultivated land and crops. This study employs multiple correspondence analysis (MCA) and hierarchical clustering of hitherto unexplored records of nearly 2,000 households that constitute the 1844-45 *temettuat* survey of the Mudanya region. While the MCA of the data shows significant profiles of the multi-ethnic and multi-religious Ottoman subjects who were of various income and vocational groups, the analysis also suggests that the Ottoman olive industry was not yet geared towards commercial agriculture, but was developing in that direction in the mid-nineteenth century. On a similar note, the paper also speaks to the literature on olive oil production in the Mediterranean and North Africa during industrialization, with the prospect of comparing the volume and the quality of olive and olive oil production in Turkey with those of other countries. The combination of methodology and the use of *temettuat* data constitute a novel approach to examine levels of wealth, property ownership, ethnic and religious denomination, occupations and sectors, rural versus urban settlements, and crops cultivated by these households. Thus, while a scrutiny into the nature of olive production is the main purpose of this paper, the available information widens the scope of the analysis, enabling a profound look at the nineteenth-century Ottoman economy through one of its significant regions, in the process of its incorporation to greater networks.

Keywords: olive; olive oil; Ottoman economy; multiple correspondence analysis.

Paul Sharp, Peter Sandholt Jensen, Christian V Skovsgaard (University of Southern Denmark) & **Markus Lampe** (Vienna University of Economics and Business)

The creation of a land 'of milk and butter': Traditional elites and the long run determinants of economic take-off in Denmark

There is a substantial literature in economics on the spread of technology, institutions and ideas across space and time, and the influence this has on economic development both across and within countries. Here we focus on a specific example centred on the Kingdom of Denmark, and the emergence of a modern dairy industry based on a new technology, the automatic cream separator, and an institution, the cooperative creamery, which it is commonly agreed propelled the country towards prosperity in the last decades of the nineteenth century.

The foundation of the first cooperative creamery in 1882 is usually seen as a turning point in Danish history. Within a decade the whole country was covered and the export of high value added agricultural produce, butter and later bacon, were to propel Denmark within a couple of decades to a position among the very richest countries in Europe. What however allowed this institution to spread so rapidly? We argue that it was the end result of a long period of agricultural enlightenment, as a modern scientific form of agriculture spread into and throughout the country (see Christensen 1996, and also Mokyr 2009, chap. 9).

Early on in the then Danish Duchies of Schleswig and Holstein a system developed on the large manorial estates known as Koppelwirtschaft in German. It became the dominant field system in the Duchies in the 1700s, and consisted of a new layout and usage of the fields through crop rotation, but since it comprised a large amount of land left aside for pasture, it also soon came to be associated with dairying. The unprecedentedly large herds of milch cows these estates kept, commonly running into the hundreds, allowed for economies of scale and the invention of an innovative new system of butter production, the hollænderi. We demonstrate that the location of cooperative creameries in 1890 is closely associated with the location of these so-called hollænderier, after controlling for other relevant determinants of cooperation. We also reveal a causal relationship by instrumenting for the location of the hollænderier by the distance to the estate where the system was first introduced. Supported by contemporary sources, we interpret this as evidence for a gradual spread of ideas from the estates to the peasantry.

Our research contributes to a number of fields: in the first place, we explain the rise of dairy cooperatives in Denmark. These are the paradigmatic case for success of cooperation in development and also one of the most salient cases of organization of agricultural producers of a specific good, i.e. milk, to be converted into butter. Second, we give prominence to the spread of a new production technology/regime among elite producers in the eighteenth century, which helped to prepare the ground, via trickle-down effects, for the rapid spread of commoner farmer cooperatives and automatic cream separators one hundred years later. By this, our third contribution becomes salient: the evaluation of the role of agricultural elites and their estates (latifundia) for economic development.

James Simpson & Juan Carmona (Universidad Carlos III de Madrid)

Supplying working capital to farmers: The village economy, the Catholic Church, and the Liberal State in Spain, 1900-36

The low levels of productivity and weak markets in traditional agriculture often led to asset-poor farmers being dependent on local elites, who used interlinked contracts to supply a variety of their needs, including land and working capital. From the late nineteenth century growing productivity promised higher farm incomes, but this could only be achieved by using more off-farm inputs, and increasing farmers' need for working capital. Changes in the quantity and manner of how capital was supplied was important for economic growth, but it has also been identified by political scientists as being crucial for democracy, by helping erode the traditional patron-client networks, and create an impersonal, market based, system.

Surprisingly, about half the working capital supplied to Spanish farmers on the eve of the Great War came from a village institution that had been created under the Old Regime over two hundred years earlier. The pósito was a rural bank that was unique in Europe, and had become a credit institution when the municipal granaries established for averting local famines started lending to farmers to plant the next year's harvest. Over time this was converted into short-term loans, repayable following the harvest. The pósitos were run by the municipal authorities, following directives from central government, in much the same way as other traditional village Common Pool Resources, such as common lands or local irrigation systems. While the pósitos still operated as a source of working capital in perhaps a quarter of the villages in central Spain in 1914, they lacked the scale and scope needed to meet the needs of more commercial forms of farming emerging at that time.

This paper looks at the difficulties faced by economic and political agents in improving the supply of traditional sources of farm credit, and creating new ones in the early twentieth century. After examining how the pósitos and the new credit cooperatives operated, it shows that a major obstacle to increasing the reach of rural credit was political. In particular, and unlike some other countries, the nature of the conflict in Spain between liberal politicians and the Catholic Church implied that neither found it in their interest to create

regional based networks to raise the necessary capital to meet the new needs of either village cooperatives or pósitos.

III/E Industry

Harilaos Kitsikopoulos (Unbound Prometheus, LLC)

Engineering skills and the efficiency of steam engines during the Watt era

This paper outlines the evolution of British engineering skills in the steam engine business during the period 1774-1800.

The first section provides a brief outline of some major (and minor) modifications in design patterns, the most important of which resulted in the generation of rotary motion thereby extending the fields of application of steam power. The narrative moves to a taxonomy of the sixty or so engineers and firms which engaged in the erection of engines by providing a concentration rate using as criteria the type of engines they erected as well as the number of counties and sectors involved. The lower the concentration rate the more global was the perspective of the erector, and the reverse. The results conform to the expectation that the size and scope of firms was inversely related to the concentration rate but there are also some interesting exceptions. The firm of Boulton of Watt is analysed as a case study and, through the narrative, the gradual amelioration in the scarcity of engineering skills is illustrated.

The last section of the paper is the most novel. It examines the impact of the above developments on the efficiency of engines reflected on fuel consumption. Relying on well over 100 fuel rate observations, well beyond what one finds in the existing literature, it traces the efficiency improvements of various models. Most importantly, it contrasts these fuel rates of actual engines with what their ideal rates ought to have been, for a given horsepower, and traces the gap between the two through econometric analysis. Preliminary results show that the gap narrows over time indicating improvement in the skills of those managing the engines on a day-to-day basis through a classic learning-by-doing process.

The paper is the second chapter of a book project which will be the companion volume of a book published last year.

Bertrand Blancheton & Stéphane Becuwe (University of Bordeaux)

French textile specialization in long run perspective: Trade policy as industrial policy, 1836-1938

By using a new database covering French international trade between 1836 and 1938 this paper focuses on the country's specialization in textiles. It demonstrates, for the first time, the major influence of trade policy on French international trade in textiles during the first globalization. Tariffs appear to be crucial determinants of specialization measured by the Lafay Index. Tariffs are also major determinants of intra-industry trade in textiles. By analysing changes in tariffs between raw textiles and finished textiles and decorrelation between tariffs we show that an effective trade protection approach was applied by successive French governments in order to sustain the industrial competitiveness of textiles. Trade policy slowed down textile despecialization until WWI.

Keywords: textile; effective protection; specialization; international trade; France.

JEL F6, N23, N73.

Tomàs Fernández-de-Sevilla (Free University of Brussels) & **Armando J Dalla Costa** (Federal University of Paraná)

The formation and take-off of the São Paulo automobile-industry cluster

Authors such as P. Swann (2009) and E. Bergman (2008) have defended the hypothesis that clusters have a lifecycle. During their early history, clusters benefit from external economies such as strong local suppliers and customers, a pool of specialized labour, public goods and knowledge spillovers. However, as clusters mature, they face diseconomies of agglomeration such as an increase in real estate prices and labour wages, congestion, and some sclerosis in innovation. These advantages and disadvantages shape the long-term cycle of the cluster. In the automobile industry, this interpretation can explain the rise and decline of clusters such as Detroit (Klepper 2010), West Midlands (Swann 2009), and Barcelona (Catalan forthcoming).

The aim of this paper is to analyse the formation and take-off of the automobile industry clustered in São Paulo. The São Paulo district remained at the top of the Latin America automobile clusters since the 1960s. In 2012, when Brazil had reached seventh position in the world ranking of producers in terms of the number of vehicles, São Paulo was still the Brazilian region with the most employees in this industry (close to 100,000). Greater São Paulo is one of the few tropical or subtropical areas in the southern hemisphere where an advanced industrial system has developed. W. Dean (1969) places the origins of São Paulo's process of industrialization at the end of the nineteenth century, when the investment of capital accumulated through coffee exportation via the Atlantic caused the first factories to emerge. Although the take-off of the automotive industry took place in the middle of the century, its roots go back to the beginning of the century.

In this paper, we aim to explain how the cluster was formed and how its take-off occurred by using four theories: External economies (Marshall 1890; Porter 1980, 1990, 1998 and 2003); the capabilities of leading and hub firms (Chandler 1960, 1977, 1990, 1992 and 2005; Markusen 1996); the adoption of strategic industry policies (Amsden 1989 and 2001; Chang 1993, 2003 and 2007; Catalan & Fernández-de-Sevilla 2013); and institutions (Olson 1992 and 1996; Eichengreen 2007; Acemoglu and Robinson 2012).

The layout of the general argumentation of the paper is as follows. The cluster experienced its take-off since 1956, once JK's government decided to boost car manufacturing. The infant industry policies based on market protection and, especially, on domestic content requirements, were key for the cluster's take-off. But, if eleven large manufacturers located facilities in São Paulo, it was because they found fertile ground in the competitive advantages present in the region. A key element for the cluster's development was the existence of an institutional framework whose action was not only an incentive for the application of infant industry policies, but also facilitated the circulation of knowledge and provided assistance to the companies in worker training and business organization. As it developed, the cluster evolved towards a hierarchical structure headed by the large car-makers, which fostered the cluster by transmitting their technological and organizational capabilities.

III/F Gender and Labour Markets

Corinne Boter & Pieter Woltjer (Wageningen University)

The impact of demand for labour and economic structure on Dutch unmarried women's labour force participation, 1812-1929

Extensive research has demonstrated that female labour force participation (FLFP) in Western Europe decreased during the second half of the nineteenth century. During this period, in the Netherlands, FLFP was even lower than in surrounding countries such as England and Belgium. Therefore, the Netherlands are generally considered to have been the first 'male breadwinner society' in Western Europe. However, in the historiography on female labour force participation factors of supply have been given much more attention than factors of labour market demand in both theoretical⁵⁹² and empirical studies.⁵⁹³ In the Dutch context, above all social norms regarding women's labour have been proposed to explain the aberrant FLFP rates. The present research argues that the strand of literature on Dutch women's labour is incomplete because factors of demand for labour have not been sufficiently taken into consideration. By including both demand- and supply factors into one analytical framework, this paper provides a more holistic understanding of Dutch unmarried women's LFP during the long nineteenth century.

Our most important source is a dataset containing information from nearly 2 million Dutch marriage records from the period 1812-1929. Previous research by Van Poppel et al. based on this source has shown that the number of brides with a listed occupation decreased during this period.⁵⁹⁴ The authors argue that because women increasingly quit their jobs *before* they got married, thus before they were expected take care of their own household, social norms must have been the main impetus for women to enter marriage as a housewife. We question the impact of social norms because: (1) these norms were already prevalent during the early modern period, (2) regional variation in FLFP was considerable, and (3) alternative explanations have not been considered sufficiently.

We run a similar logistic regression to estimate the probability that brides stated an occupation in their marriage record. As Van Poppel et al., we account for the occupational status of the groom, the decade and province where the marriage took place, the age of the bride, GDP per capita, and whether the bride and groom lived in an urban or rural location. Crucially, however, we also include measures of the economic structure of the municipality where the marriage was registered (i.e. the share of employment in the main economic sectors). We emphasize that we do not reject the influence of social norms. In fact, from ample other qualitative research it has become apparent that by the end of the nineteenth century in the Netherlands, domesticity which required a stay-at-home wife was actively pursued by the middle as well as by the working class.⁵⁹⁵ We stress the reciprocal relationship between supply and demand and nuance the social norms thesis rather than rejecting it.

The key finding of this research is that local labour markets indeed influenced FLFP to a significant degree. We confirm that the sectors 'textile and apparel manufacturing' and 'private services' especially had a positive effect on FLFP. Throughout the long nineteenth century, a greater than average employment share for these sectors in a given municipality coincided with an above average FLFP. A substantial part of the decreasing FLFP that was previously explained by the decade dummy that captured (among others) changing social norms, is actually the result of shifting sectoral shares. To further explore the importance of local labour markets, we decompose FLFP based on the variables used in the regression. The results show that sectoral shifts in the Dutch economy in the period 1812 to 1929 can explain

⁵⁹² Becker, 'A theory'.

⁵⁹³ van Poppel, van Dalen, and Walhout, 'Diffusion'; Minoletti, 'The importance of ideology'; de Vries, *The industrious revolution*.

⁵⁹⁴ van Poppel, van Dalen, and Walhout, 'Diffusion'.

⁵⁹⁵ Boter, 'Ideal versus reality?'.

46 per cent of the decline in FLFP during this period. The residual category, capturing the impact of changing social norms, explains 32 per cent of this decline.

Sectoral shifts may additionally explain the low Dutch FLFP rates relative to other countries because the structure of the Dutch economy was exceptional. Industrialization took off relatively late and by the turn of the twentieth century, still one-third of the total labour force worked in agriculture (as opposed to 12 per cent in Britain and 23 per cent in Belgium). Indeed, this paper shows that the rapid expansion of the professional service sector and the relatively small textiles, large agricultural, and well-developed transport, wholesale and retail sectors is the most likely source of the decreasing FLFP during the long nineteenth century. Countries with larger shares in sectors with ample demand for female labour most probably had higher overall FLFP rates. In more general terms, this means that the slow rate of Dutch industrialization, especially compared to England and Belgium, was driving the diverging FLFP rates within Western Europe during the long nineteenth century.

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Maria Stanfors (Lund University) & **Joyce Burnette** (Wabash College)

Is it who you are, where you work, or with whom you work that matter for earnings? Gender and peer effects among late nineteenth-century industrial workers

Does working with more productive peers increase productivity? And if so, do such peer effects lead to spillover effects in wages? Recent studies have shown the importance of co-workers for productivity in the contemporary labour market. We assess the impact of co-workers on men's and women's productivity and earnings in the past, exploiting matched employer-employee data from the Swedish cigar industry circa 1900. The data provide detailed information on individual characteristics for men and women holding the same jobs and also many characteristics of the firm; such information is rare but important. We are thereby able to control for factors both at the individual and workplace level, and also construct variables capturing co-worker characteristics.

Our research aim is three-fold: was it who you were, where you worked or whom you worked with that mattered for earnings? To answer these questions, we estimate standard wage regressions. We first analyse the importance of individual characteristics for earnings, then control for firm-level characteristics, and finally add co-worker characteristics as variables measuring peer effects.

We begin with individual characteristics, which explain 71 per cent of wage variation for men and 61 per cent for women. Wages rose rapidly with experience during the first few years in the occupation, but soon reached a plateau. Firms' characteristics also mattered, but in a gendered way. Both men and women earned more at firms in the three largest cities. Large firms paid men more but women less than small firms, and firms with higher income per worker paid men but not women higher wages. Firms with higher income per worker paid men, but not women, higher wages.

We find evidence that with whom you worked mattered for earnings, but only under certain circumstances. In the case studied, experienced co-workers seem to have improved training, but only when both the learner and the co-workers were female. Male wages were, if anything, lower in the presence of more experienced co-workers. Explanations for these patterns include different group dynamics according to gender, e.g., that there was some sort of female solidarity leading women to help other women (though no such solidarity among men). It is also possible that men didn't need the help of their experienced co-workers because they were receiving training in other ways. Our results suggest that the mechanism of peer effects worked through knowledge spillover and learning on the job rather than social pressure, since only low-experience women received a benefit from having more skilled peers.

Keith Sugden (University of Cambridge) & **Roger Sugden** (University of British Columbia, Kelowna)

Economic development of the interior of British Columbia, Canada: A study of occupations and nominal wage differentials in the Okanagan, 1901-21

This paper is part of a larger study that explores occupational and other data to track the economic and social development of the Okanagan, a region in British Columbia, Canada (see maps 1 and 2). The Okanagan is of particular interest because it is now a key economic driver of British Columbia Interior and one of the most prominent entrepreneurial regions of Canada. Despite the growth and importance of the region, there is little academic literature on the history of its development. There is, however, a substantial volume of historical records waiting to be researched.

The Okanagan, part of the Okanagan (Syilx) First Nations territory, was first settled by Europeans in 1859. Communities began to develop as the Okanagan Trail became a route taken by miners coming north from the USA. Fruit farming was introduced in the last decade of the nineteenth century, and today the region has a well-established wine industry. In 1891, the city of Kelowna did not exist. Today, it is the largest metropolitan area in British Columbia outside of Vancouver and Victoria, the fastest growing city in the province and the fifth fastest in Canada.

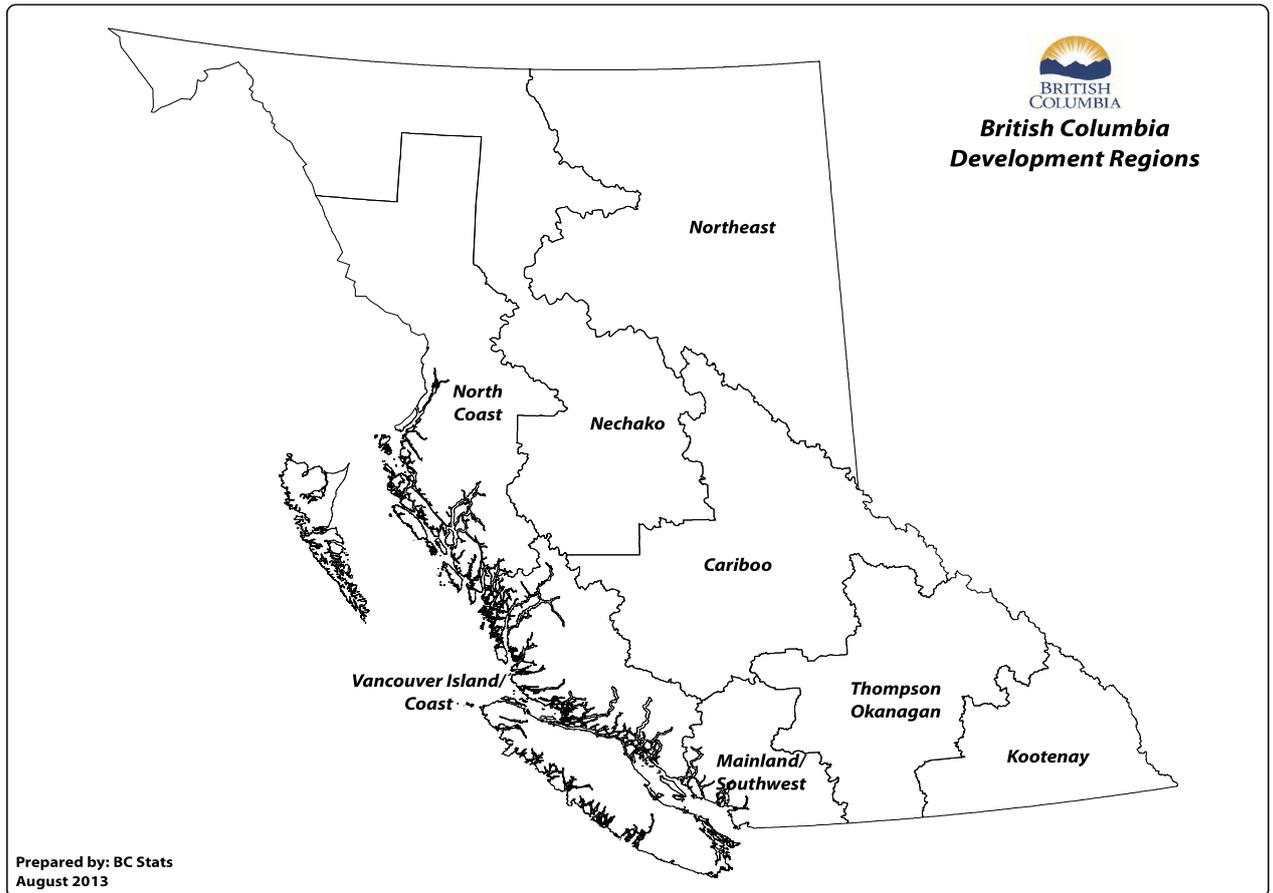
An initial study, forthcoming in *BC Studies*, determines changes in occupational structure, the introduction of technology and transport, and the rise of urban centres, 1881-1921.⁵⁹⁶ Our analysis here focuses on wage differentials, by gender, by occupation, and by place. It draws upon the Canadian censuses of 1901, 1911 and 1921, each of which contains information on those persons in gainful and wage-earning occupations. The 1901 census lists occupation, the wage paid for work in the previous 12-month period and the number of months worked. The 1911 census records occupation, whether waged or on own account, the 12-month wage, the weeks and hours worked. 1921 censuses list the wages paid and the number of weeks worked. These data permit the temporal trends to be tracked over the 20-year period. The 1911 census is additionally useful in that, by listing the number of people working on their own account, it allows for an analysis of business ownership, particularly of farms and of farm size. In addition, contemporary Board of Trade data provide supplementary information to give an indication of investment and start-up costs, the crops grown, and the potential \$ yields expected.

The Okanagan is a small region. Okanagan Lake to Penticton at the southern tip is only approximately 100 kilometres, but there are clear differences in the number of weeks worked in a year and in the wages paid. For instance, in 1921 labourers in Penticton and Vernon were paid more than those working in Kelowna, located approximately mid-way between the two. Carpenters in Kelowna worked for significantly more weeks in the year than

⁵⁹⁶ Roger Sugden and Keith Sugden, "Economic Development of Interior British Columbia: A Case Study of Occupations in the Okanagan, 1881-1921", *BC Studies*, forthcoming.

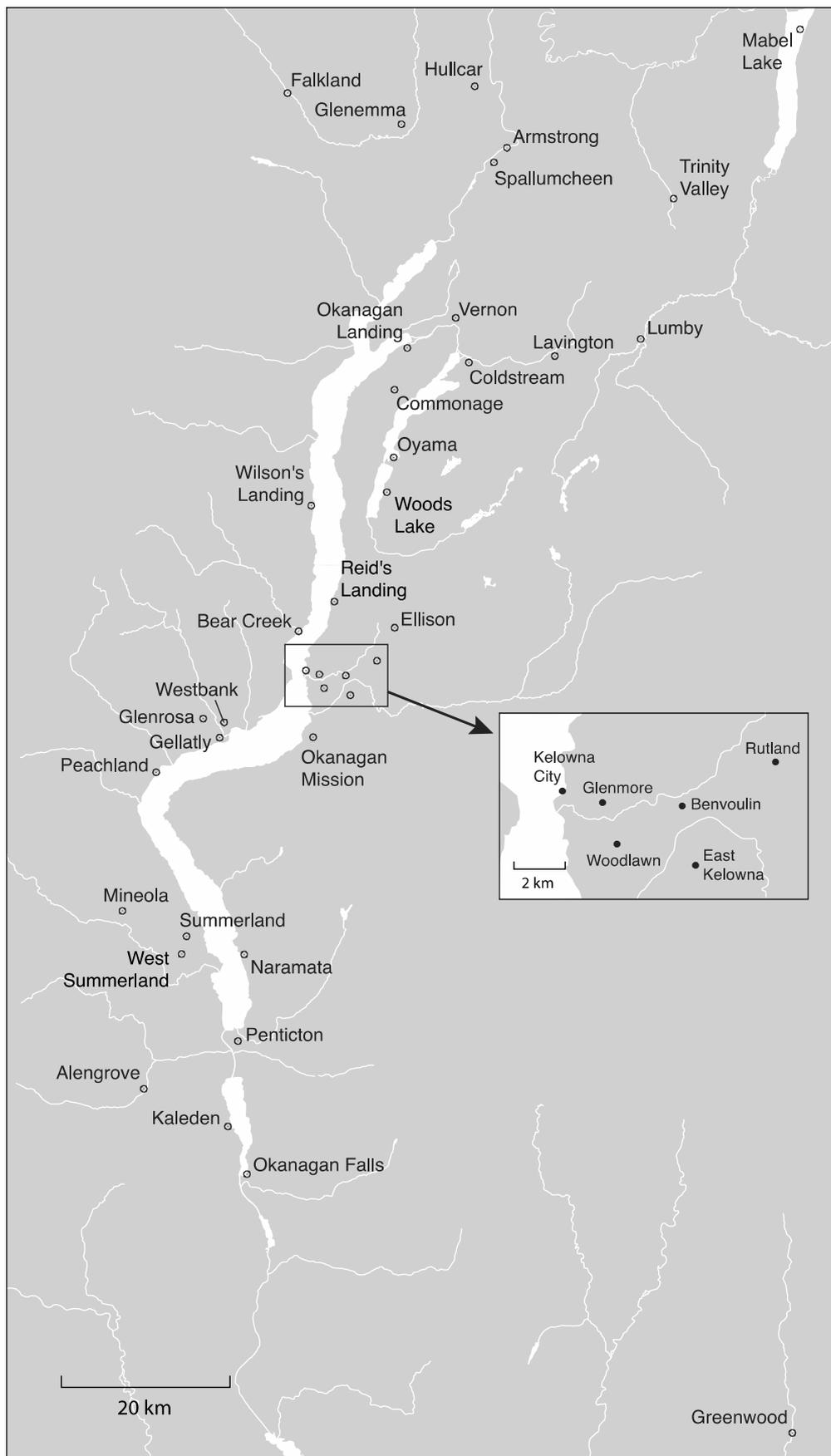
did those in Vernon, and in consequence, were better paid. Whilst the driver of economic growth was fruit farming, other industries had significant impact. For example, by 1921, Penticton and Vernon were on a railway line, but Kelowna was not connected until four years later. Penticton railwaymen accounted for approximately 14 per cent of the male workforce and earned on average \$1,596 pa. In the same year, the average wage of a Penticton labourer was \$941 pa. Detailed analyses are ongoing to provide a comprehensive understanding of spatial differences in nominal and real wages, males and females, the factors that drove them, both within the Okanagan and elsewhere in British Columbia and Canada.

Map 1: *British Columbia*



Source: Copyright © Province of British Columbia. All rights reserved. Reproduced with permission of the Province of British Columbia.

Map 2: *The Okanagan*



Source: Cartography by Eric Leinberger, University of British Columbia.

III/G Human Capital in Africa

Jeanne Cilliers & Erik Green (Lund University)

Pre-transitional settler fertility on the South African frontier, 1787-1834

Whether or not households exercised deliberate fertility control before the fertility transition remains a disputed topic amongst demographic historians (Dribe and Scalone 2010, Guinnane 2011). This question has recently garnered attention in the Eurasian context (Tsuya et al. 2010), particularly by those who argue for the importance of socio-economic factors in explaining the fertility decline (Dribe 2009; Bengtsson and Dribe 2014, Molotoris and Dribe 2016). Very little, however, is known about pre-transitional fertility in settler societies and even less about how it relates to the prevailing socio-economic conditions.

Is there a specific fertility pattern for European settler societies overseas? Harris (1977) suggests that north-western settler frontier societies were fairly homogenous with low levels of social stratification. Land abundance, labour scarcity and underdeveloped markets favoured the establishment of independent nuclear families on primarily subsistent farms. Eventually, however, inequality would rise due to population growth, market integration and the closing of the frontier. Easterlin (1976) argues that under such conditions parents thought about family size in the context of inheritance. Couples who did not benefit from the rising land prices associated with frontier closure restricted fertility to avoid dividing their bequests among too many heirs.

Alternatively, frontier fertility decisions may not have been determined by the economics of settlement, but by the distribution of wealth. Following this line of argument Clark and Hamilton's (2006) hypothesis that wealthier individuals in pre-industrial societies were able to afford and guarantee more surviving offspring may have some explanatory value. But in frontier contexts, couples' demand for children as labour cannot be neglected, since children often laboured alongside slaves on settler farms (Dooling 2005). This argument implies that the type of agricultural activity was important for fertility decisions.

This paper will contribute to the debate by investigating pre-transitional fertility amongst farming households in the Cape Colony, by modelling differential fertility by district, agricultural type, slave ownership, and changing frontier conditions. Until recently most of the discussion on historical fertility in South Africa has either been anecdotal, coming from traveller accounts, or based on records which are subject to selection problems (Guelke 1988, Simkins and van Heynegen 1989). Newer research offers a more comprehensive account of the settler fertility transition (Cilliers and Mariotti 2016[a], 2016[b]) but a more geographically disaggregated study using longitudinal data is required to model fertility decisions at the individual level.

To do so, we will merge two individual-level datasets: the Cape of Good Hope Panel (CGHP) and the South African Families database (SAF), both of which are unique in their size and scope, across time and space. The CGHP is an annual account of household production in colonial South Africa, covering the period 1673-1828. The SAF database is a genealogical dataset of all settler families in South Africa, covering the period 1652-1910. The combination of these two sources, once complete will be the largest dataset of its kind for any society in the world spanning multiple generations and provides a unique opportunity to empirically test theories of deliberate fertility control in the pre-industrial period.

Leigh Gardner (London School of Economics)

'The Love of Liberty Brought us Here': Migration of African-Americans from the United States to Liberia, 1820-1904

African-American settlers and their descendants dominated Liberian political and economic institutions for nearly 150 years after the country's declaration of independence in 1847. This paper examines the human capital of the migrants, drawing on individual-level data for 16,000 African Americans who migrated from 1820-1904. By comparing the migrants to those who remained in the US using American census data, the paper contradicts claims made by earlier studies that migrants were disproportionately literate and skilled. It shows instead that, following an initial wave of more skilled pioneers, migrants were largely southern, unskilled and illiterate relative to their peers. This became increasingly true as migrants faced a choice between migration to northern cities and Liberia after the US Civil War. The paper argues that this changing composition of settlers helps to explain the adoption of institutions in Liberia which closely resembled those of the American South. It also contributes to our understanding of regional development within Liberia.

Dácil-Tania Juif (Wageningen University)

Resource curse or blessing? The impact of mining activities on schooling in Zambia

The abundant extraction of natural resources, especially mining, affects an economy in many ways. The "resource curse" literature has investigated the effect of resource abundance on GDP growth and other indicators of human development and wellbeing. However, this literature hardly takes a historical perspective. The emergence of an important mining industry in the context of a colonial state can affect, for instance, the development of its fiscal system, labour relations and other institutions.

This paper focuses on the effect of mining activities on the human capital development of the indigenous population in Zambia since the 1930s. It contributes mainly to two streams of literature. First, the African economic history literature that aims to explain differences in formal education within Africa (e.g. Bolt and Bezemer 2009, Gallego and Woodberry 2010, Frankema 2012, Cogenau and Moradi 2014). This literature holds that colonial enrolment rates are highly correlated with present day literacy and schooling. Thus, regions that performed relatively well in early colonial times continue to do so today. Second, the resource curse literature that mostly claims that natural resource abundance impacts negatively on human capital accumulation (Gylfason 2001, Papyrakis and Gerlach 2004). Conventional wisdom might however suggest a positive relationship between resource abundance and human capital development. On the supply side, if limits to public educational investments result from government budget constraints, additional revenues from resource exports should, *ceteris paribus*, induce more public investments (Birdsal et al. 2001). On the demand side, if an emerging mining industry employs local labour with a higher level of education than the prevailing average, the population has an incentive to invest in schooling. Furthermore, for families that are not anymore engaged in subsistence or commercial farming, the opportunity costs of sending children to school are lower, since child labour is most common in agriculture.

Zambia is a suitable case study, because the copper industry has been the backbone of its economy for almost a century. Moreover, in cross-country regressions, mostly African countries drive the negative effect of resource abundance on education. We perform a sub-national level analysis, which offers a more homogenous setting than cross-country studies, to focus on the effect of resources on education. We also add a long-term perspective to a resource curse literature that has covered only the past 30 years due to data constraints.

Government and mining company reports, as well as population censuses, allow us to quantify mining activity – as output and as share of the population engaged in mining – at the district level since colonial times, and draw a (causal) link to past and present education levels. In a regression analysis we also control for a set of geographic factors that affected

early missionary settlement and thus the spread of formal schooling. This study finds no evidence of path-dependency in education in Zambia. The reason is a reversal in the mining-education relationship: it is negative in early colonial times, when mission location determined enrolment and mining compounds were particularly undersupplied with schools, and it becomes positive from the 1950s. Due to a number of factors, including technological progress, the relaxation of the de facto colour bar, the permanent settlement of workers and their families in the compounds and the emergence of indigenous trade unions, the mining companies started to hire more skilled indigenous labour, invest in their training and offer schooling for their children. This shift is also reflected in a steep rise in miners' real wages, as shown by Juif and Frankema (2016).

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III/H Institutions and Inequality

Peter Foldvari (International Institute of Social History) & **Katalin Buzasi** (University of Amsterdam)

The geographical and institutional determinants of the location of Christian missions in Sub-Saharan Africa

There is a consensus in the literature on the colonial roots of welfare differences in Africa that missions acted as fundamental agents of the colonial administration. Since Weber's prominent work (1905) in which he argued that Protestant values made the advent of modern capitalism possible, many have researched the role of religion in explaining socio-economic changes and development differences across the world. Empirical studies provide evidence that countries with high Protestant share are more likely to experience higher per capita income and economic growth (Grier 1997), democracy (Barro 1999), and stronger rule of law (Licht et al. 2007).

The aim of this paper is to provide a comprehensive analysis of the temporal and geographical distribution of Protestant and Catholic missions until the 1920s based on historical evidence, economic theories and a newly completed georeferenced database. Although there are studies which aim to explain why missions were present at certain locations and not at others, existing evidence is rather descriptive (Johnson 1967, Pirie 1985), is based on a few case studies (Johnson 1967) or focuses on certain geographical factors only (Mantovanelli 2013).

We rely on a new dataset on Christian missions containing much more missions than the most used map by Roome (1924) and information on society name and origin, foundation date and size. This paper employs spatial statistical tools to explore how geographical and climatic factors, colonial policies and local conditions such as traditional economic activities and social organization, slave trade, proximity to Islam affected the location decisions of European missionaries in Africa. The paper also separates the effect that local societies' level of development had on the location of missions from the effect of missions on their social and economic development.

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Alexandra López Cermeño (Lund University)

Universities and spillovers in the human-capital century

The role of human capital on economic growth has been long discussed in economic literature. The idea that better educated workers increase productivity is hardly contested since the emergence of endogenous growth models where innovation comes from the mix of labour, human capital, and knowledge.⁵⁹⁷ However, the debate on the ability of universities as the motor of economic growth has flourished in the literature (Aghion et al. 2009). Valero and Van Reenen (2016) recently argued that regions with higher numbers of universities per capita exhibit higher long-term GDP per capita growth rates. The increase, they argue, is linked to higher aggregate demand, but also to more skilled labour, patent innovations, and the establishment of pro-growth institutions. The relationship between universities and institutions has been historically significant already in the middle ages, as shown by Cantoni et al. (2014).

The literature addressing the impact of universities is varied. Some papers evaluate single-case institutions through the analysis of economic indicators, or surveys; others apply a macroeconomic framework based on models deriving knowledge production functions from the location of institutions (Griliches 1979; Jaffe 1989). The use of cross-sectional panels to evaluate the economic impact of these institutions is also popular. The framework used in this paper is closest to the macroeconomic perspective.

Specifically, this paper offers a view in which the localization of a new academic institution acts as a positive local knowledge shock. One of the objectives is to use a long-term panel database to confirm that universities improve the local economy. This hypothesis has been tested on several occasions using short time periods; additionally, I aim to assess the extent to which local spillovers spread geographically and whether they persist over time. In this area of work, Valero and Van Reenen (2016) have found that the growth effects of universities expand to nearby regions; while Audretsch and Feldman (1996) and Anselin [2000] find that spillovers are specific to certain innovative industries.

There are several contributions to the debate in this text. First, the use of a long-term panel dataset from 1930 to 2010 presents evidence relevant to explain the evolution and persistence of the shock in the long run, in an era where growth dynamics have changed from factor accumulation to technology and innovation, (Cantoni et al. 2014, make this point in their analysis).

Secondly, this paper demonstrates that the impact of new universities goes beyond the local economy by using a novel methodology. My analysis of the spatial spillovers takes advantage of the geographical decomposability of market potential, used a proxy for demand, as defined by Harris (1954). This methodology enables the assessment of the effect of the new universities at different geographical levels. Evidence shows that a new university can contribute to growth in neighbouring counties, but not further than the state boundaries.

This paper considers the potential problem of endogeneity using different strategies. Counties receiving new universities might already be expected to grow before the university attracts new human capital, thus making the causal direction of the relationship with local market potential to be uncertain. I use differences in differences (DiD) analysis on a sample of counties selected through propensity score matching (PSM). This method allows the assessment of the causal impact of the new universities on the growth patterns of the “treated group” compared to counties as statistically similar as possible in terms of relevant covariates (urbanization, agricultural share of employment or population growth) without new universities (untreated “matched group”). The outcome variables are county GDP, population, and demand derived from market potential at different geographical scales (local, state neighbouring countries, domestic and total demand). I perform the same analysis considering

⁵⁹⁷ Barro (2001), Lucas (1988). The theoretical base comes from the positive external effects of human capital accumulation which compensate the costs of agglomeration.

per capita GDP and demand growth to capture any productivity improvements that should impact the long term.

Evidence suggests that counties holding new universities grew around 25 per cent more in terms of GDP over the period, and the effect expanded to nearby counties as well. However, new universities did not affect growth in terms of per capita GDP. Controlling for the research quality of the universities and the role of transport infrastructures to the transmission of knowledge spillovers shows that a new establishment generates growth only through short term agglomeration economies in terms of population.

This paper puts forward that the role of universities as motors of long term economic growth is limited. Very much in line with the idea of knowledge renovation proposed in “Reinventing Boston”, Glaeser (2005), this paper shows the need of regular human capital investments to perpetuate growth.

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Jonathan Chapman (New York University)

Democratic reform and the growth of government in nineteenth-century Britain

In this paper I analyse whether democratic reform aided or hindered the development of urban infrastructure in nineteenth-century England. The period after 1850 saw a vast expansion of the role of local governments in England in providing infrastructure to cope with the unprecedented demands of industrial cities. On one hand, rapid urbanization caused urban living environments to deteriorate and necessitated investment in new sanitary infrastructure. On the other, technological improvements in areas such as tramways and electricity supply provided new opportunities for government investment. However, to undertake such investments local councils were forced to increase expenditure to unprecedented levels, creating financial difficulties and intense political debate. Changes in the electorate that selected those local councils were thus critical in determining the pace of infrastructure development.

Over the course of the nineteenth century the power of the poorest citizens in these elections increased significantly, both through the granting of greater voting rights and the

implementation of the secret ballot. In this paper I test the hypothesis that this extension of political power to the poor slowed the development of new infrastructure, since poorer individuals may prefer to spend their income on more basic needs such as food. Specifically, because all households had to pay taxes, all citizens were faced with a “price” for the government-provided public good. If the marginal utility of private consumption (e.g. food) of the poorest citizens was extremely high, even a small tax burden could be sufficient to lead the poor to desire lower government spending than wealthier citizens.

To capture the effects of democratization I exploit differences in the governance of town councils both across towns and over time. In particular, I take advantage of the fact that, until 1894, towns that were incorporated were governed under a more democratic system than other towns. Town councils in incorporated towns were elected under a secret ballot and under a franchise where each head-of-household held a single vote. In unincorporated towns, in contrast, there was no secret ballot in place, and citizens could receive up to 12 votes depending on the value of the property they owned and occupied.

I exploit an 1894 national reform that imposed the system of one-household-one-vote and secret ballot on unincorporated towns. After this point in time, all towns were governed under the system previously used in the incorporated towns. This reform is used as the treatment event in a difference-in-difference analysis, where the ‘control’ towns are those incorporated before the reforms and the treatment group consists of the unincorporated towns that were previously governed under the less democratic council system. I use an identifying assumption of ‘parallel growths’, which implies that in the absence of treatment the difference in the growth in spending per capita between unincorporated and incorporated towns would have remained the same. My main dependent variable is the annual total current expenditure per capita by local governments. This measure includes spending by town councils on a wide range of public goods and services, with major items including water supply, street maintenance and cleaning, and sewer systems. In addition, the measure also captures growth in infrastructure stock since it includes expenditure on repaying and servicing the loans used to pay for infrastructure improvements.

I then test whether the trend growth in government spending per capita in unincorporated and incorporated towns was different in the ten years prior to the reform (1884-94) compared to the ten years after the reform (1894-1903). The results show that the 1894 democratic reforms slowed the rate of growth in public expenditure in unincorporated towns. Prior to the reforms, public goods spending in unincorporated towns kept pace with (if not exceeded) spending in incorporated towns. In contrast, in the decade following the 1894 reform spending grew significantly more slowly. Similar effects are found for the growth of tax revenue per capita, consistent with the argument that opposition to spending was driven by a desire for greater consumption by the poor.

These findings indicate that, in contrast to many theoretical models, democratic reform led to a reduction in the growth of government expenditure. However, they do not provide any evidence of where the impetus for greater public spending actually came from. To isolate the mechanism through which expenditure was reduced, I use a proxy for the degree of middle-class control of each town to distinguish between councils that were controlled by the ‘middle class’ and those controlled by the ‘rich’ before the 1894 reform. I find that the reforms had a strong negative effect in middle-class-controlled towns but little evidence that they had any effect in the upper-class-controlled towns. These results are robust to different definitions of middle-class control, and to different specifications.

IV/A Early Modern Accounting and Finance

Nadia Matringe (London School of Economics)

Ratio Pecuniam Parit. Accounting and the making of financial markets in the early modern age

Research in early modern accounting has mostly been concerned with the role of DEB in the rise of capitalism and the socio-cultural factors which led to its development. This study adopts an inductive approach to accounting, to demonstrate its role in the shaping of financial markets in the pre-modern era. Based on the analysis of a series of accounting operations performed by the Salviati bank of Lyons in the sixteenth century, it demonstrates the frequent oneness of accounting and transacting in the context of a dematerialized commission-based exchange activity. Simple games of book entries in the corresponding accounts of commercial partners performed payments, clearance and banking transactions across time and space, thereby contributing to the integration of financial markets at different scales (local, regional, international). Accounting thus sustained a European system of payments and credit that it also had the potential to destabilize, through illicit transactions supporting a black market for bills of exchange.

Alejandra Irigoien (London School of Economics)

Standard error: the problems for economic historians from (mis)taking Spanish American silver as commodity money, 1718-1830

Revisiting a relatively forgotten high frequency data series on the price of silver bullion and specie in Britain between 1718 and 1831, the paper discusses the implications of the notion of silver as commodity that economic historians use when building various estimates for the purposes of global comparative economic history. It also qualifies established interpretations about the economic development in Latin America in the transition from the colonial to the postcolonial economy. The estimate shows that the silver peso had a large premium (around 20 per cent) over the mint price in Britain in the course of the eighteenth century. During the Restriction Period (1797-1821) the premium was extraordinarily high – higher than that of gold bullion – averaging nearly 40 per cent between 1808 and 1816. Whereas the causes of such appreciation in Britain have not been fully researched yet, the use of the silver peso/dollar in the international economy and the prevalence of different exchange rates at different points in time and in different markets in Asia, Britain and Spanish America gave way to a substantial currency trade – yet to be analysed more systematically. In this light the paper explores the implications of such overvaluation of the exchange rate in Latin American economies, in their terms of trade and in the particular growth of the exports to, and imports from, Britain which economic historians thus far have explained solely on political grounds; namely as the effects of (misconstrued) free trade policies. The paper offers detailed examples of the expansion of commodity exports out of South America and of the boom of British textile exports in Chile, the River Plate and Cuba observed in the period.

Paul Kosmetatos (University of Edinburgh)

The role of bills of exchange in the contagious transmission of mid-eighteenth century financial crises

The two peacetime financial crises of 1763 and 1772-3 impressed their contemporaries for displaying an impressive geographical range that encompassed Britain, continental Europe and the North American colonies. Modern literature has repeated period claims of financial distress causally “spreading” from place to place without elaborating on the possible mechanisms by which it may have done so. At most there have been allusions to investor panic, in turn leading to depressed asset values and a credit crunch. This paper identifies the network of bills of exchange as a major vector through which financial distress was contagiously transmitted across different financial centres, and employs contemporary manuscript evidence to describe the various mechanisms, both direct (domino) and informational, by which it propagated across the asset and liability sides of balance sheets. It finally argues that the Bank of England’s proposed Last Resort Lending role in this period was primarily concerned with supporting the bills market by means of paper banknote loans, in an operation that was already very similar to Henry Thornton’s narrative of the Bank’s support of the country banking system after the suspension of specie payments in 1797.

IV/B The Occupational Structure of England and Wales, 1600-1911

Sebastian Keibek (University of Cambridge)

Establishing reliable estimates for the male occupational structure of England and Wales, 1600-1850

Historical occupational structures provide detailed and comprehensive insights into economic developments, particularly at sub-national levels, for which they are often the only quantifiable data available. This paper builds on earlier work of the ‘Occupational Structure of Britain 1379-1911’ project. It presents the analytical background of the Cambridge Group’s current best estimates for the male occupational structure of England and Wales between 1600 and 1850. It addresses why estimates underpinning the national accounts literature, typically based on contemporary social tables, are unreliable and insufficiently detailed. The paper’s results are based on the Group’s existing dataset of three million parish register observations and on a recently constructed dataset of two million probate records. It investigates the defects in these sources and demonstrates why they are both insufficient in isolation. It explains how they can be combined in such a way that the strengths of each data source are used to neutralize the defects in the other. It demonstrates how this results in a set of national estimates at much higher frequency (every twenty years) than were available before, and going back a full century earlier in time, as well as the first set of robust regional and local estimates before the nineteenth century. It also describes the methods which were used for addressing other key challenges in creating reliable occupational structures, such as the allocation of labourers to occupational sectors, and the incorporation of by-employments. Finally, it briefly presents some of the results, and shows the significant differences to estimates in the literature – leaving their interpretation to the paper given by Leigh Shaw-Taylor in this same session.

Xuesheng You (University of Cambridge)

The changing patterns of female employment, 1600-1911

This paper utilizes two large bodies of digitized data, namely British parish registers and censuses, from the ‘Occupational Structure of Britain c.1379-1911’ project to investigate the changing patterns of female employment between 1600 and 1911. It aims to present the most systematic and comprehensive quantitative account of female employment 1600-1911 to date. British censuses started recording female occupations from 1841 onwards. However, given its well-known problems, this paper makes major revisions to the census data for female employment, particularly concerning married women’s employment to arrive at more accurate and consistent figures for the period 1841-1911. Direct evidence on female employment before the census era is sparse and often non-compatible across different sources. For this period, this paper uses an innovative approach to estimate female participation rates and occupational structure based on relatively robust data for male employment from parish registers and probate records (to be discussed in the proposed paper by Keibek) and sex ratios in different industries discovered from various secondary sources as well as censuses.

Several major findings emerge from this paper. First, if there was an industrious revolution leading to increased female labour force participation from the early seventeenth century, it came to an end in the late eighteenth century not in the mid-nineteenth century. Second, the mechanization of textile industries around the end of the eighteenth century was a watershed causing massive and very long-term contraction in female labour force participation. Third, there is no evidence suggesting a large scale withdrawal of women from the labour market from the mid-nineteenth century as de Vries suggests. There was a modest withdrawal but only at the end of the nineteenth century. Fourth, spatial and temporal variations in female labour force participation can be explained primarily by variations in labour demand. Last but not least, it reinforces the Cambridge Group’s earlier finding that the

structural shift in employment towards the secondary sector happened long before the classic period of industrial revolution.

Leigh Shaw-Taylor (University of Cambridge)

The occupational structure of England and Wales, 1600-1911

Building on the papers by Keibek and You this paper will provide an overview of economic development 1600-1911 for England and for Wales and at regional level and a brief sketch of developments between 1381 and 1600 deriving from work by Richard Smith on 1381. Keibek's new estimates indicate that as early as 1600, 30 per cent of adult males worked in the secondary sector, a figure that rose to 44 per cent by 1700 and then fluctuated at a very stable level for two centuries. This suggests that the economy was even more industrial in 1700 than our earlier (2014) results suggested but confirms the broad picture that the structural shift in male employment to the secondary sector, usually associated with the classical industrial revolution period, 1750-1850, was in fact complete by 1700. But the new estimates make clear that the whole of the seventeenth century was a period of labour-intensive industrialization and also that this process began in the sixteenth century, if not earlier.

Our estimates show female employment in the textile sector collapsed dramatically with the mechanization of spinning in the late eighteenth century and that the overall female participation rate fell from 75 per cent or more in c.1770 to less than 45 per cent in the early nineteenth century – a finding with considerable significance for the standard of living debate. Our estimates for both sexes combined indicate that the relative importance of the secondary sector actually fell during the classic industrial revolution period. It is also likely that any increase in male child labour in the period was more than offset by a decline in female child labour.

The new estimates of male occupational structure suggest that the tertiary sector grew steadily across the seventeenth and eighteenth centuries and from 8 per cent in 1600 to 14 per cent in 1800 but much more rapidly in the nineteenth century reaching 37 per cent by 1911. Structural change 1700-1911, so long presumed to be dominated by the relative shift of labour from agriculture to industry was in fact a shift from agriculture to mining and services.

At the regional level two findings stand out. First, the high levels of secondary sector employment in some counties at an early date: Lancashire had 31 per cent of adult males in the secondary sector in 1600 and 53 per cent in 1700; Norfolk had 40 per cent in 1600 and 63 per cent in 1700; Nottinghamshire 44 per cent and 50 per cent; Suffolk 38 per cent and 47 per cent. The second major finding is the scale of regional deindustrialization between 1680 and 1851: Wiltshire had 20 per cent of adult males in the textile industry across the second half of the seventeenth century but only 5 per cent by 1851; Devon had 8 per cent of adult males in textiles around 1680 but only 1.6 per cent in 1851; Norfolk had 33 per cent of adult males in textiles but only 1.5 per cent in 1851; Suffolk had 16 per cent of adult males in textiles in 1680 but only 3.4 per cent in 1851; Dorset had 16 per cent of adult males in 1681 but only 2.1 per cent in 1851.

Finally, the paper will address the wider implications for our understanding of early modern economic development and the industrial revolution.

IV/C Metropolis, Modernity and Decline: London in the Late Nineteenth Century

Giorgio Riello (University of Warwick)

Does quality distinguish itself? Producers, consumers and commodities in late Victorian London

Late Victorian London was characterized by an abundance of goods that would have been bewildering for consumers of just a generation earlier. Yet, these goods were often considered as substandard, lacking in design quality, and poor in material terms. This paper considers the ways in which quality was 'negotiated' between consumers and producers. The majority of consumer goods continued to be produced by small artisans and sweated labour, not as standardized and industrially-produced items. The pressure on producers to satisfy an expanding demand created new ways of understanding what quality might be. Victorian producers, consumers and distributors replied to such issues through legal means but also by shifting and re-calibrating production and methods of distribution. This paper draws on the theory of conventions and on research carried out in the Charles Booth Archive at the LSE. It considers how consumers and producers defined quality and uses the debates over trademarks and the importation of foreign goods as two key moments when concerns over quality became part of public discussion and necessitated legal intervention. The paper concludes by assessing how quality might be used as a lens through which to bring together production and consumption in Victorian London.

Donna Loftus (Open University)

Tale of Two Cities: Modernity and decline in late nineteenth-century London

Based on research carried out on the Charles Booth Archives at the LSE, this paper explores the relationship between east and west London to better understand how ideas of London's modernity and decline co-existed. It charts the everyday entanglements of people and products alongside contrasting sociologies of the city with their competing visions of economic and social vitality. It contributes to the social and economic history of the metropolitan economy by investigating the ways in which production and consumption were intricately connected and yet conceptually separate.

Histories of nineteenth-century London have produced 'tales of two cities': on the one hand histories of the East End have tended to focus on economic decline and poverty; those of the West End on consumption and leisure. This paper puts these worlds together by looking at the survival (and thriving) of urban manufacturing and its connection to consumption. The paper considers in particular those sectors of the London economy that integrated manufacturing and service (such as food, drapers and department stores). The aim is to offer new perspectives (a) by investigating the inter-connections between the production and consumption of consumer goods in the metropolitan economy; and (b) by considering the extent to which London's so-called 'modernity' related and relied on commodities cheaply produced in the East End.

Rohan McWilliam (Anglia Ruskin University)

The Gatti Family and the Victorian West End: Food, theatre and entrepreneurship in the making of London's pleasure district

This paper is derived from a larger social and cultural history of the West End of London that I am writing. The West End has often been ignored by historians and yet it was a laboratory of mass culture in many ways. I argue that we need to think more about pleasure districts and their functions in modern cities. Victorian mass culture was built on the links between cheap tasty food and populist entertainment. Where modern tourists visiting the West End flock to the Angus Steakhouse before taking in an Andrew Lloyd Webber musical, they once ate and were entertained in venues owned by the Gatti family. This paper examines how the Gatti family shaped the Victorian West End in decisive ways in the later nineteenth century. Quite simply, they brought food and entertainment to the many. Cheap eats, performance, song and alcohol were linked in spectacular spaces that created the idea of the 'night out' for the masses. The family's influence flowed from Carlo Gatti, who hailed from Ticino in Switzerland and created an extraordinary food empire. He built up a chain of popular cafés and restaurants in the capital, many of them staffed by family members or emigrants from Ticino. Members of the Gatti family diversified into the production of chocolate and ice cream; others moved into making popular entertainment their speciality, launching a number of the most important London music halls. The Adelphi and Vaudeville theatres became part of the Gatti empire, whilst Gatti's restaurant on the Strand proved a major landmark offering good quality food at a cheap price. The family's entertainments and restaurants were key to making the West End a less male and more family-friendly place. The paper examines the Gattis as an underappreciated force in the development of modern consumerism and popular culture. It also constitutes an argument for the ways in which economic and cultural historians need to be in dialogue with one another.

IV/D Conflict and Compromise

Kerstin Enflo (Lund University)

From conflict to compromise: The importance of mediation in Swedish work stoppages, 1907-27

In this paper, we analyse the role of mediation in labour market conflict resolution. The time period covers the first 20 years of state-sponsored mediation in Sweden. Despite international influence, the Swedish mediation institution initially got an original design. Mediators were personally appointed, enjoyed high levels of social prestige, and were responsible for conflict prevention and resolution within geographical districts. We use a new database with geocoded information on the cause, characteristics and outcome of all recorded work stoppages in Sweden, supplemented with information on the location of mediators. In order to identify the effect of mediation on compromise outcome we instrument mediation with geographical distance between the location of the work stoppage and the mediator's office. Our contribution is threefold. Firstly, we analyse a labour market that has been thought of as a role model for other countries, but whose system of mediation has not been systematically investigated. Secondly, we exploit the geographical nature of the Swedish system of mediation to assess issues of causality. Thirdly, we discuss variation over time and the heterogeneity of conflict causes to analyse whether the importance of mediation changed as the Swedish system of industrial relations evolved – from a state of violent conflict. We find that mediation in this context actually did make a difference on whether a work stoppage ended up in a compromise. Thus, mediation was not only used by parties who were ready to make concessions in any case. In this way, the Swedish mediation institution may have contributed to fostering compromises in the decades that the fall in the frequency of conflicts and the rise of the famous Swedish Model in the labour market. Our results suggest that mediation could have paved the way for a cooperative atmosphere in the local labour market. At the national level such an atmosphere was clearly manifested in the General Agreement in 1938 and with the rise of the Swedish Model.

Pablo Martinelli (Universidad Carlos III de Madrid)

Green Front, Brown Tide? Agriculture, the Great Depression and the collapse of the Weimar Republic

This paper contributes to the literature on the link between economic crisis and political extremism by focusing on the economic motives driving voting behaviour in interwar Germany. For decades scholars have argued over the catch-all as against lower-middle class nature of the Nazi movement. The prevailing consensus today acknowledges that the Nazi party was able to draw support from all sections of German society, although this support was not uniform across constituencies. Hence, recent research increasingly focuses on the role played by particular constituencies (and mechanisms) in its ascent. Though this uneven association between social and economic composition and voting behaviour is often labelled “economic voting”, economic motives are barely introduced into the analysis as such.

A spectacular case is the role played by peasantry. Peasantry has been identified as one of the key constituencies of the Nazi Party. Despite the urban dynamism that conventional wisdom associates with Weimar Germany, almost half of the Germans lived in the countryside or in small towns with less than 5,000 inhabitants and one quarter of them earned their life from agriculture on the eve of the Depression. It was in the countryside that the Nazi Party scored its first electoral successes. Without the electoral support of the countryside, it would have been unthinkable for Hitler to seize power.

Yet the actual motives for the political behaviour of the German countryside remain largely unexplored. Although recent research has expanded our understanding of the rise of political extremism by identifying long-run persistence or particular diffusion mechanisms, most scholars simply assume that the growing rural support for National Socialists was driven

by a peasantry hard-hit by the Great Depression. This assumption has never been empirically tested. This paper aims at filling this gap by actually exploring the mechanism linking sectoral economic distress and rural voting patterns. In order to do so, it exploits variation in the impact of the Great Depression from a new disaggregated database on interwar Germany agriculture. With it, it explores whether different measures of peasants' economic stress are actually associated with the surge in peasants' electoral support to the Nazi party in rural and largely agricultural electoral districts.

Alexandros Apostolides (European University Cyprus), **Michalis Zaouras** (University of Groningen) & **Alexis Antoniou** (Boğaziçi University)

Nationalism, policing and inequality: Understanding outbursts of violence using the 1931 Cyprus riots

In our efforts to understand what causes riots, researchers face a series of challenges. Firstly the underlying theoretical model that seeks to explain why people choose to disobey authority is debated intensely between psychologists, historians and economists. Secondly the empirical data in order to test the hypothesis on why people riot are often incomplete, and require a long run time series, which often creates a new set of challenges.

We further the discussion of the topic from both a theoretical and an empirical perspective. We introduce the concept of effective policing in when and where individuals chose to undertake disturbances in violation of state rules. In addition, we utilize a novel detailed dataset on riots: the 1931 riots in Cyprus, which were thought to be a serious challenge to British colonial authority.

We map income, land distribution, community affiliation and capital stock at a village level for all villages in Cyprus, enabling testing of the reasons villages instituted disturbances. Our results indicate that politics and inequality were important predictors in which villages had disturbances, but effectiveness of policing (or lack of) is a fundamental part of explaining the rural pattern of violence.

Thus in a riot that was always historically explained in communal lines, we find evidence that effective policing (or rather the lack of it) played a more important role in the outbursts of disturbances.

IV/E Economics and Politics

Charles Read (University of Cambridge)

The economic consequences of Sir Robert Peel

British economic policy in the nineteenth century has often been described as being the result of the development of a political consensus based around ‘Gladstonian finance’ in the 1850s and 1860s. Various scholars have attributed the shift towards balanced budgets being the norm, the transfer of the tax burden from indirect to direct levies, and the movement towards unilateral free trade as the result of the influence of William Gladstone at the Treasury and in Downing Street. Indeed, as Ernest Bevin jokingly put it, ‘Gladstone was at the Treasury from 1860 to 1930’. Yet, as Martin Daunton has recently touched upon, this veneration of Gladstone downplays the role of his mentor, Sir Robert Peel. He helped establish the gold standard, reformed Britain’s central bank legislation, put Britain on the path towards freer trade and freer capital flows, started the transfer of the fiscal burden towards direct taxation and pushed the ideal of balanced budgets onto the middle ground of British politics in the 1840s. These policies remained more or less unchanged for the rest of the century. Using a range of sources, including politicians’ private papers as well as financial statistics, this paper examines the original aims of Peel’s major economic policy reforms, and looks at their impact on the British economy throughout the rest of the century. In particular, this paper examines their impact on British financial stability and on the financial crises of 1847, 1857 and 1866. It reveals that the financial and imperial policies stemming from the consensus based on Gladstonian finance – especially the insistence on balanced budgets and imperial self-sufficiency – can be seen as policy responses borne out of the practicalities created by the combination of economic-policy reforms that Peel had introduced.

Rui Esteves & Gabriel Geisler Mesevage (University of Oxford)

Networks of influence: The British railway mania of the 1840s

We draw on the unique circumstances of the British Railway Mania of the 1840s to identify whether British MPs engaged in ‘logrolling’: the trading of votes in order to advance their private interests. In the 1840s, speculation in railway shares prompted the creation of hundreds of new railway companies. Each company needed to petition Parliament for the approval of new railway routes. At the height of the railway mania (1845-46), the normal parliamentary procedures were overwhelmed by the amount of company promotions. Consequently, Parliament devised an ad hoc procedure that started by dividing the hundreds of applicants by numerous parliamentary subcommittees. We create a dataset of MPs’ individual interests in railways, drawing on data on the proposed routes of railways and MPs’ investments in these new railway lines, which had to be declared as part of the new approval procedure. This was to make sure that subcommittee members did not have a direct interest in the companies they decided on. We also build a dataset of MPs’ oversight of railways, constructed from data on the structure of parliamentary subcommittees. Combining these two datasets we were able to confirm that the formation of subcommittees avoided direct conflicts of interest. This, however, did not exhaust the opportunities for strategic voting.

Drawing on methods from social network analysis, we identify situations where MPs could have traded votes with specific colleagues in order to get their preferred railway approved. We then estimate whether MPs used these opportunities to further their interests using models drawn from spatial econometrics. Our estimates reveal that MPs coordinated their voting behaviour in order to approve railway companies in which their colleagues had a vested interest when their colleagues did the same. Our design allows for causal identification in that the membership of the subcommittees could not have been known at the time MPs sunk in their personal investments in particular railways. In a sense, the only thing an MP could be assured of was that he would not be directly ruling on a company he had invested in or that proposed to build a line crossing his constituency.

We also present robustness checks to test our identification strategy. Our analysis improves on current methods for the detection of vote trading behaviour (logrolling), while clarifying the conditions under which logrolling might be identified. In addition, this study contributes to an understanding of the politics underpinning the selection of railway lines that would go on to create the British railway network – a topic that remains frustratingly opaque. Finally, we contribute to an understanding of the political behaviour of mid-nineteenth century British MPs.

Hugh Pemberton, Aled Davies & James Freeman (University of Bristol)

'Everyman a capitalist?' or 'Free to Choose'? Exploring the tensions within Thatcherite individualism

It is widely recognized that 'the individual' was prioritized by the Thatcher governments. However, there has been little analysis by historians of exactly how the Thatcher government conceptualized 'the individual' both in theory and in practice as it sought to turn neoliberal ideas into practical policy. In this paper we remedy this deficiency by undertaking a case study of a key Thatcherite social policy reform: the introduction of 'Personal Pensions' (a reform programme intended to individualize retirement savings and investment above the level of a minimal state pension and, in the process, sweep away the entire architecture of earnings related pension saving, both state and private). This approach allows us both to understand the position of 'the individual' in terms of the theory that underpinned the 'Thatcher revolution' but also to understand it at the functional level of Thatcherite policymaking in practice. In doing so we will argue that there was no coherent or fixed Thatcherite concept of the individual. Instead we identify three fundamental tensions: (i) should individuals be capitalists or consumers; (ii) were (and are) they rational or irrational; and (iii) should they be risk-taking entrepreneurs or prudent savers? These tensions themselves reflected, in part, conflicts within the diverse tapestry of postwar neoliberal thought but our paper will demonstrate the way in which they were crystallized by the practical problems of rendering ideas into policy. Ultimately we demonstrate that the ideal of creating a society of entrepreneurial investor capitalists was discarded when faced with practical constraints, and that this cemented the Thatcherite preference for giving individuals the freedom to choose within a competitive market.

IV/F Regional Inequality

Anna Missiaia (Lund University)

The historical roots of regional divergence: regional GDP in Sweden, 1750-1850

The extent and causes of regional inequality in the process of economic growth and development are at the core of historical economic research. In a classic article, Williamson (1965) proposed the view that industrialization led to increasing regional inequality. However, economic historians have argued that differences in the level of GDP already existed well before industrialization. For instance, recent estimates of regional GDP for Sweden from 1860 to 2010 show that inequality was high already at the outset of the industrial revolution (Enflo et al., 2010). The same is true for other large European countries such as Italy (Felice, 2011) or Spain (Roses et al., 2010).

The existence of regional heterogeneity on the eve of the industrialization of the nineteenth century calls for more focus on regional inequality in the eighteenth century. One big challenge is represented by the availability of reliable and homogeneous regional statistics before the mid-nineteenth century. Unsurprisingly, Sweden represents the exception among European countries: labour force statistics from population censuses at regional level are available from the mid-eighteenth century onwards. These can be used to allocate to regions the national estimates of agriculture, industry and services from Schön and Krantz (2015). This methodology, introduced by Geary and Stark (2002), is standard practice for historical estimates and is considered the most reliable when direct measures of output are not available. The estimates we present here are for the 10-year-benchmarks from 1750 to 1850.

According to the Swedish historiography, the period from the late eighteenth century to the industrial take-off in the second half of the nineteenth century is crucial in explaining the success of the Swedish industrialization. Different explanatory factors have been considered, such as the emergence of a relatively sophisticated financial sector, a large human capital stock and the development of an internal market (Schön, 1997). The combination of production and trade through local institutions has been brought about as a distinctive feature of Sweden in this period (Magnusson and Nyberg, 1995). Closeness to communications also mattered for growth in industrial employment and population (Berger and Enflo, 2015). All these factors are expected to reflect into GDP differentials across regions.

This is also the period when regional inequalities started rising, reaching their peak in 1870. Our new regional estimates will for the first time cast light on the regional dimension of this fundamental period for the Swedish historiography. Also, the series will be among the first to be produced at subnational level in the pre-industrial period for a European country. This evidence will not only account for the Swedish regional patterns but also bring preliminary evidence on the pre-industrial in general. Moreover, by connecting our series to the existing ones by Enflo et al. (2014) for the period 1855-2000, we will be able to produce the longest set of regional GDP series to date for one single country. This will open the door to a very long run analysis that has so far only been performed on national series.

Giovanni Federico (University of Pisa), **Alessandro Nuvolari** (Scuola Studi Superiori Universitari) & **Michelangelo Vasta** (University of Siena)

The origins of the Italian regional divide: evidence from real wages, 1861-1913

The origins of the regional divide between Northern and Southern Italy is a one of the classic debates of Italian economic history, which is enjoying a revival in recent years. Economic historians have produced new estimates of regional GDP per capita (Daniele and Malanima 2007, Felice 2011) and have supplemented them with information on social indicators as heights (A'Hearn and Vecchi 2011), life expectancy and educational attainments (Felice and Vasta 2001). Yet the exact timing of the divergence is still controversial, as all available estimates refer to few benchmark years. This paper contributes to this debate by providing yearly series of real wages from the Unification to World War I for 69 provinces and five macro-areas. We follow Allen's (2001) approach, which has now become standard in the international literature on standard of living. We find that:

- i) Italian real wages were extremely low in comparative perspective: they were less than a fifth of the English ones and sometimes lower than the Chinese ones;
- ii) Italian real wages stagnated until the early 1880s, grew slowly, with some fluctuations, until the early 1900s and faster in the ten years before the war;
- iii) the real wage/GDP per capita ratio remained virtually stable throughout the whole period, suggesting a stable income distribution;
- iv) levels and trends differed across macro-areas of the country:
 - real wages were higher in the North West than in the rest of the country in the 1860s and the gap widened throughout the period;
 - the North East wages remain roughly constant until the beginning of the twentieth century and grew afterwards quite fast, with some catching-up with the North West;
 - the series of the other macro-areas (Centre, South and Islands) remain flat, with a spike in the Islands on the very eve of World War I.

The North-West (or industrial triangle) was the cradle of Italian industrialization, while we speculate that the modest growth of real wages in the North East and Islands reflects the effect of the large transatlantic migration since the beginning of the twentieth century (Taylor and Williamson, 1997).

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Monica Bozzano (University of Modena & Reggio Emilia) & **Gabriele Cappelli** (Universitat Autònoma de Barcelona)

Schooling worth getting? School efficiency and human-capital depreciation in Italy's provinces, 1861-1911

The problem of school efficiency is a pressing one in the context of today's development and education policy. The Millennium Development Goal of universal primary schooling brought about increased enrolments and attendance – yet it often compromised quality education. Economic historians have shown that European countries on the eve of the twentieth century tackled similar issues. In fact, schooling expanded rapidly; yet, this pattern of growth was characterized by large regional inequalities within and across countries: some areas, especially in southern Europe, remained characterized by limited improvements in literacy, (Lindert 2004; Mitch 2013).

Recent research has focused on a number of European regions in the nineteenth century and up to World War I. Most contributions have explored the role that school policy, as well as a variety of socio-economic and institutional factors, played in the expansion of basic education (Beltran Tapia and Martinez-Galarraga, 2015; Cappelli, 2016; Cinnirella and Hornung, 2016, on Spain, Italy, and Prussia respectively). However, little is still known about the efficiency of said policies: to what extent did educational reforms, increased resources and better management actually translate into better learning? To what extent were better outcomes (if any) compromised by human-capital depreciation?

The case of Italy before the Great War is of particular interest: indeed, since unification (1861), the country was characterized by large regional disparities in human capital (Felice and Vasta, 2015). Recent research has shown that limited financial resources and elite's limited commitment to fund public schools hampered the development of primary schooling – especially in the south of the country (A'Hearn, Auria, and Vecchi, 2011; Cappelli, 2016). However, notwithstanding the positive impact on human capital accumulation due to the shift towards centralized primary education, it is worth investigating the role of increased efficiency – more than increased resources – in the development of Italy's education system before 1911's reform. To shed light on this issue, we construct a dataset on educational outcomes, school inputs, and socio-economic factors in the country's 69 provinces at ten-year intervals between 1861 and 1911.

First, we examine the evolution of school efficiency by offering a new measure of human-capital depreciation based on primary sources making use of data on the literacy of pupils in school (age 6 – 10), as well as their literacy ten years later (age 15 – 19). This new measure aims to capture the extent to which schooling actually translated into better education that could persist through time.

Secondly, we exploit the panel dimension of our data to investigate school efficiency across Italian provinces, by relying on a modified version of the econometric model proposed by Schwartz and Zabel (2013) in which literacy rates (the outcome) are related to their past values and a set of time-variant and time-invariant determinants. The authors' original model used school fixed effects to capture efficiency as a residual. Accordingly, we try to separate the impact of geography from that of school efficiency.

IV/G Long-Run Perspectives

Joerg Baten (University of Tuebingen) & **Richard Steckel** (Ohio State University)

The history of violence over the past two millennia: Archaeological bone traumata as a source for European violence history

How did the intensity of violence develop over the last two millennia? Can we measure it, at least approximately? And what might have caused changes over time as well as differences between regions and social groups? The relevance of such a study needs hardly to be stressed – personal security has always been one of the most important aspects of human welfare. Taking a long-run perspective allows us to gain crucial insights about the propensity of humans to act violently against others. The big challenge of a study that covers two millennia is clearly to gain indicators that are sufficiently informative, reliable and representative. They cannot be without measurement error for such a long period, but we invest substantial effort to assess their validity and the representativeness of the archaeological data under study. We will further compare the observed trends with other violence indicators.

In this contribution we will make use of the fact that cranial traumata often resulted from violence, as do the cases in which the evidence points to weapon wounds. The share of weapon wounds plus cranial traumata for all skeletons with sufficient preservation is employed as the main indicator.

One of our main findings is that during the first three quarters of the last two millennia there was no dramatic decline in violence. In fact, even an increase during the late medieval period took place. Secondly we find generally lower violence in the northwestern part within a minimum value at the continental North Sea coast (today's Netherlands and parts of NW Germany). Frisian traders created in this region a trading empire during the early medieval period. Violence control apparently came as a side effect. In general, the Mediterranean and central, eastern and southeastern Europe had higher levels of violence. In general we find that the cross sectional patterns confirm a human capital interpretation of early violence reduction: There were lower violence levels in the urban areas from the High Medieval period onwards. The decline of violence started earlier behind urban walls. Among the rural population in contrast, no downward trend could be identified before the early modern period. Finally we find a tentative and preliminary interregional correlation between human capital indicators (such as the number of manuscripts written in medieval monasteries) and violence. Areas with higher human capital tended to have lower violence, which is compatible with earlier research that provides evidence for the post-fourteenth-century homicide rates (Eisner 2014).

Jaime Reis (Universidade de Lisboa) & **Antonio Castro Henriques** (University of Porto)

From horn to corn: The two regimes of Portuguese agriculture, 1250-1850

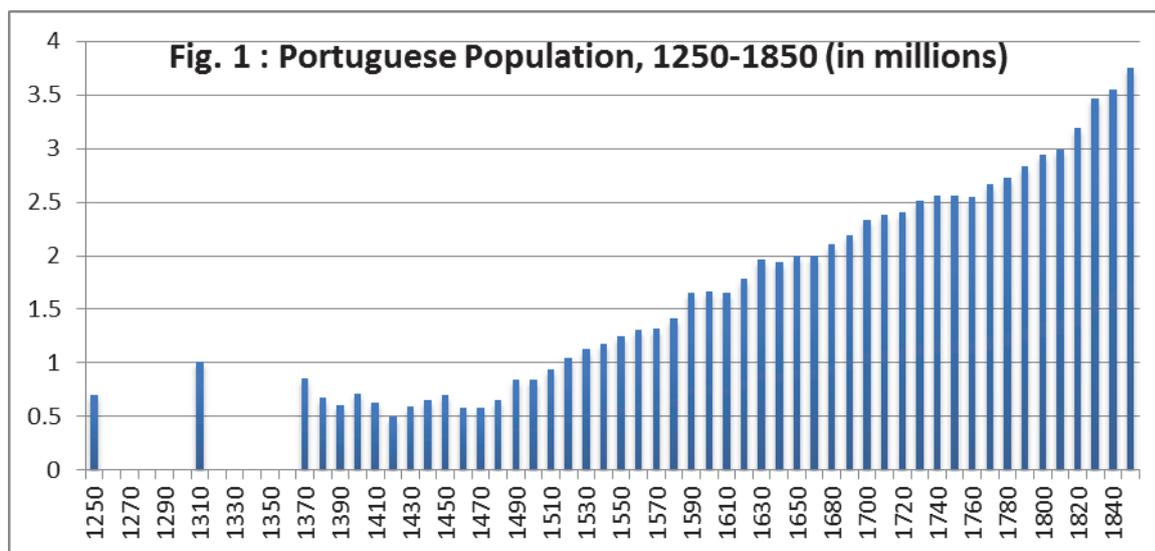
Throughout Europe's pre-industrial era, agriculture was the chief determinant of the economic performance of nations (Dennison and Simpson 2010; Federico and Malanima 2004). In spite of this, detailed quantitative studies of national agricultural sectors covering long time periods have until recently been rare and even now are hardly common.⁵⁹⁸ While possessing a considerable tradition in this historical field, Portugal has not been the subject of much long term quantitative analysis, although of late it has witnessed an unusual surge in this area of research.⁵⁹⁹

The Portuguese case raises three points which make it of interest. The first is an unusually dynamic demography over the six centuries which we contemplate here. As shown in figure 1, between 1250 and 1870 population rose, remarkably, by more than 500 per cent, from ca. 0.7 to 3.7 million inhabitants. In contrast, the European average was 380 per cent,

⁵⁹⁸ Britain: Broadberry et al. (2015); Netherlands: Van Zanden and Van Leeuwen (2012); Spain: Alvarez-Nogal et al. (2016); Italy: Federico and Malanima (2004); Sweden: Edvinsson (2009).

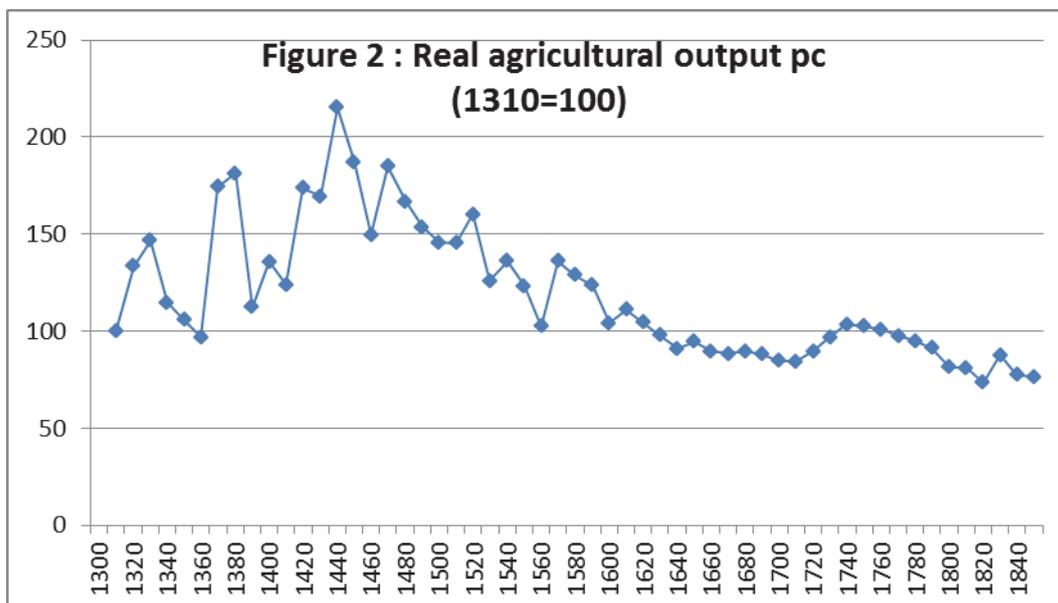
⁵⁹⁹ Freire and Lains (2016); Costa et al. (2016) and Reis (2016).

while the most significant overall increases were 510 per cent for England, 450 per cent for the Netherlands and 384 per cent for Scandinavia (Malanima 2009).



The second one is that this was one of the few European economies which, before the Black Death, got off to a flying start thanks to a windfall of natural endowment acquisition. Between 1249 (the end of the *Reconquista*) and 1348, an extra 35 per cent of empty land was added to the already underpopulated land mass employed by this country’s agriculture (Henriques 2015: 18). In a time of technical stagnation, such a remarkable boost to the land-labour ratio must have given Portugal a major advantage. The question posed is whether this became a structural advantage.

The third is key to much of the economic history of the West. Without substantially sacrificing living standards or requiring substantial food imports (Crafts 1985 a; Costa and Reis 2016), how did this farm sector sustain such a relatively large and fast growing population on the basis of a fixed stock of natural resources? Figure 2 displays annual data for per capita agricultural output and leaves no doubt that this achievement was indeed possible. It also shows that despite pronounced long term swings, by the start of industrialization the food consumption status of the average Portuguese was still roughly as much as it had been in 1300, a renowned ‘time of plenty’ (Henriques 2015). Yet during this time span the land-labour ratio fell to a mere fourth of its original benchmark level.



This paper describes the principal changes undergone by Portuguese agriculture from the *Reconquista* to the middle of the nineteenth century. They fall into two distinct agrarian regimes, one designated here as the ‘frontier economy’, from 1250 to the early 1500s; the other, from the sixteenth to the mid-nineteenth centuries, which we refer to as the ‘low wage economy’.⁶⁰⁰

The first was characterized by high land/labour ratios, high labour productivity and high real wages. Animal husbandry – mainly pastoralism on vast areas of rough grazing – played a major role, and contributed to the generous living standards, based on a high protein diet enjoyed by the population. It might thus be termed an ‘era of horn’. This formative stage also saw the emergence of institutions that regulated the appropriation of production factors and the exchange of their products until the nineteenth century. Under this institutional framework, ‘feudal’ constraints were not sufficiently strong to prevent considerable internal migrations that opened the way to the equalization of the marginal product throughout the country.

Over the course of the sixteenth century and under the pressure of a faster growing population (annual rate of 0.7 per cent), a transitional phase took place which was to usher in an entirely new set of circumstances. Important features of this epoch were a marked drop in the land-labour ratio, a sustained decline in real wages and a drop in per capita food consumption. Rents rose relative to wages and the prices of land-intensive crops (meat) escalated relative to those of labour-intensive ones (grain). Not surprisingly, the indications are of a considerable effort of land clearance to expand the arable at the expense of grazing land. Technical change on the other hand was essentially absent, as it had been already during the time of the ‘frontier economy’, something which nevertheless did not prevent significant gains in land yields.

The second agrarian regime, which Portugal settled into after 1600, contrasted distinctly with the first. Land-labour ratios dropped now to substantially lower levels, arable continued to gain over animal husbandry, and farming became far more labour-intensive. The attendant shift to lower levels of labour productivity and real wages, did not prevent, however, a steady state of per capita food consumption from being reached despite a doubling of the population.

This remarkable evolution was made possible by the occurrence of two momentous changes in the structure of agriculture, both of them aimed at saving on the increasingly scarce resource – land – and replacing it with labour and capital. One was a progressive shift away from animal husbandry and towards grain and wine production. As the consumption pattern reveals, ‘corn’ inexorably drove out the ‘horn’. The second took the form of significant innovation in two key sectors – grain and wine. In the first instance, an outstanding case of Columbian exchange led to a massive shift from the traditional wheat and rye dietary dependence, to one largely based on American corn (maize). This was an irrigated crop, with much higher per hectare labour inputs and caloric contents, and proved capable of fostering a new kind of ‘industrious’ agriculture. In the second instance, a similar evolution happened when a centuries-old productive tradition was converted, in a few decades, into a highly competitive and technically sophisticated sector, that of port wine, which made Portugal one of the principal exporters of agricultural commodities of the eighteenth century.

This paper uses freshly-minted time series for real wages, per capita food consumption, labour intensity and productivity, land yields, per capita agricultural output. Their construction is explained in Reis (2016) and Palma and Reis (2016) and they are drawn from a recent database of prices, wages and rents for Portugal, which can be consulted at PWR-Portugal 1300-1910 (<http://pwr-portugal.ics.ul.pt/>).

⁶⁰⁰ We follow here, with some adaptations, the outline proposed by Alvarez-Nogal and Prados de la Escosura (2013) for Spanish history.

Stephen Broadberry (University of Oxford) & **John Wallis** (University of Maryland)
Growing, shrinking and long run economic performance: Historical perspectives on economic development

Economies can experience episodes of negative growth of per capita GDP (i.e. “shrinking”) as well as positive per capita GDP growth (i.e. “growing”). To date, most work on long run economic performance has focused on “growing”, but recent work for the post-1950 period has suggested that economies vary as least as much in how they “shrink” as in how they grow. Despite these findings, there has been little research into why poor societies shrink so often or by so much. Furthermore, economic historians have not so far systematically investigated the possibility that improved long run economic performance could have been due to less shrinking rather than faster growing, despite the widespread acceptance of the idea that living standards increased only slowly during the industrial revolution. In this paper, we draw on recently available annual series of GDP per capita reaching back to the medieval period to show that economic historians, as well as development economists, need to explain a reduction in the rate and frequency of shrinking rather than an increase in the rate of growing, if they are to understand economic performance over the long run.

The key empirical findings reported here can be summarized as follows: (1) In most of the world since 1950, and historically for today’s countries where data are available back to the thirteenth century, growing rates and shrinking rates have been high and variable. (2) When average growing rates have been high, average shrinking rates have also typically been high. Similarly, when average growing rates have been low, average shrinking rates have been low. (3) The improvement of economic performance since the thirteenth century has occurred primarily because the frequency and rate of shrinking have both declined, rather than because the growing rate has increased. (4) Indeed, as long run economic performance has improved over time, the short run rate of growing has normally declined rather than increased, but the frequency of growing has increased.

V/A Slaves, Serfs and Peasants

Judith Spicksley (University of York)

Slaves, serfs, bondmen or villeins? The decline of slavery in medieval England revisited

At the heart of this paper lies a historical conundrum. Why, if slavery in England had been replaced by serfdom in the twelfth century, do writers in the sixteenth and seventeenth centuries continue to use terms such as ‘slave’, ‘serf’, and ‘villein’ interchangeably?

Historians interested in mapping the trajectory of slavery in England have suggested that the institution had disappeared by the late middle ages. The decline may have begun in the late Anglo-Saxon period, but most historians are at least agreed that the number of the enslaved fell after the Conquest in 1066. That William’s invasion did not in itself result in wholesale enslavement has been explained in relation to the beginnings of a new notion of chivalric behaviour. Wyatt’s recent explanation for the decline in slavery places shifts in cultural attitudes at the centre of slavery’s medieval demise, arguing for a developing antipathy to slave raiding and trading as part of the broader development of an enlightened and civilized Englishness, set in opposition to a barbarous Anglo-Saxon past and an equally uncouth Celtic present. Earlier cultural explanations include the liberalizing effects of an expanding Christianity, in which enslavement of fellow Christians became unthinkable, but most emphasis has been placed on the effects of economic development, through a combination of technological change, demographic expansion, market growth and a shift in the nature of agricultural production. The role of the manorial system (of agrarian production) in the decline of slavery in England is understood to have been of crucial importance. Serfdom – the system of unfree labour associated with the manorial system – in the view of many commentators, replaced slavery as the primary mode of restricting the freedom of the individual, although its boundaries and markers were different. Slavery as a system of labour extraction depended on a relationship of personal subjection that defined the individual status of the enslaved. Serfdom, on the other hand, was organized around landholding in which individuals were bound to provide labour to their lord by virtue of their tenurial relationship with him. The term ‘serfdom’ has been used to refer to a generic group of systems of agricultural production based around a manorial format, and located predominantly in Europe. In England the variant in question is referred to as ‘villeinage’, a specific common law institution that developed in the twelfth century. Following Bloch’s influential model of the ‘slave-tenant’ settled on a small plot of the land in Europe at the end of the Roman Empire, the process of giving slaves access to land is now understood to have been the most likely method of bringing about the western transformation of ‘the slavery of the ancient world into the serfdom of the medieval’.⁶⁰¹

While there has been significant debate about the causes of slavery’s decline, there has been much less disagreement about its timing. Susan Mosher Stuard did point out in 1995 that from a gendered perspective, slavery had not been extinguished in medieval Europe. ‘Domiciled slaves, although much reduced in numbers by the central middle ages . . . kept the idea of slave labour alive, and within the domestic sphere in southern [Mediterranean] towns slavery saw a revival in the later medieval period’.⁶⁰² Debra Blumenthal’s more recent study of slavery in fifteenth-century Valencia has very much extended our knowledge of this ‘revival’ in Europe. That England does not undergo a similar process has been of major significance in explaining its economic precocity, but both Ruth Mazzo Karras and David Wyatt have provided examples of young women who were kidnapped and sold as prostitutes in the early modern period. As Wyatt notes, ‘if we recognise the institution’s intimate

⁶⁰¹ Rosamond Faith, *The English Peasantry and the Growth of Lordship* (Leicester University Press; London, 1997), 69.

⁶⁰² Susan Mosher Stuard, ‘Ancillary Evidence for the Decline of Medieval Slavery’, *Past and Present*, 149 (1995), 27.

connection with sexual exploitation and expressions of power/masculinity, then we will also notice that there has been a disturbing continuity in the existence of slavery from the medieval period and into the modern era'.⁶⁰³ The kidnapping and sale of English children to early American colonists has also been a feature of recent investigation.

This paper suggests that for a number of reasons we have missed the broader continuation of slavery in England between the twelfth and the seventeenth centuries. In part this is because it did decline, but it also became less visible. On the one hand the economic roles undertaken by slaves were no different from those done by individuals who were free. On the other, the institution of villeinage used a new language to define itself: the unfree were villeins, bondmen and *nativi*, and were not identified as 'slaves'. It is also clear that there was an overlap between unfree status and unfree tenure that has not yet been adequately investigated. Later histories have been heavily influenced both by the transatlantic slave trade, which provided an unforgettable image of the 'slave', and by the emergence of two major theoretical approaches: classical economic theory; and the Marxian materialist dialectic. Together all these factors have been instrumental in bringing about a reluctance to translate the Latin word *servus* as 'slave' in the legal texts, literature and documentary evidence of late medieval England, and give preference instead to the language of villeinage. Slavery may have changed its appearance in the late medieval period, but in law, little had changed by the seventeenth century. Those of unfree status still owned nothing, could devise nothing, and were at the will of their lords; moreover their children inherited their unfree status.

Robert Portass & Graham Barrett (University of Lincoln)

The Middling Sort: Managing estates and expectations in early medieval Spain

The twelfth-century monastic cartulary of Celanova (Galicia) is one of the richest and most important sources to survive from medieval Spain. Within it are copies of some two hundred documents from the tenth century, a handful of which appear to be straightforward inventories of the monastery's holdings, as well as records of the renders it received from its clients. These documents, all but unique in contemporary archives, have escaped any critical scrutiny: their contents are characterized as yet further proof of the emergence of an increasingly dominant and exploitative style of lordship around the year 1000, thought by many to define the socio-economic development of the centuries on either side of that date. This paper will examine the most revealing of these inventories, asking new and more probing questions of the material, before deploying it as a solid foundation for reconsidering the entire paradigm. We will begin by reviewing the mechanics of accumulation and consolidation, asking how a major monastery turned land into wealth, a process often simply taken for granted by the secondary literature. We contend that the monastic landlords of Celanova employed a 'light touch' in estate management, which saw them rely on the use of informal records and the assistance of a series of middle-men, peasants themselves, who were embedded to varying degrees in the village communities with which the monastery dealt. The landlord-peasant binary, in other words, oversimplifies a complex hierarchy with many members in the middle. What was the nature of this relationship? Did it differ from village to village? And who owed what, to whom, and via whom? In this paper, the false opposition of lords on the one hand, and peasants on the other, is empirically and theoretically challenged by an investigation which differentiates between the many strata of the peasantry; in this way, we will illuminate social and economic relations in tenth-century Spain, while simultaneously underlining how the dominant Marxian historiographical focus of the field is unsound. By analysing the seemingly trivial, fine-grain distinctions that existed among the inhabitants of each village, we restore individuality to these labourers and middle-men; what emerges is a dynamic series of communities in which social hierarchy mattered, transforming our conceptions of social mobility, client networks, and the peasant mentalité.

⁶⁰³ David Wyatt, *Slaves and Warriors in Medieval Britain and Ireland, 800-1200* (Brill; Leiden, 2009), 395-7.

Erik Bengtsson (Lund University)

The stratification of the Swedish peasant farmer class, 1750-1900

Pre-industrial Sweden is famous for its self-owning and independent peasant farmer class. In contrast to for example Britain, peasant farmers were the norm for agricultural production throughout the eighteenth and nineteenth centuries, and the peasant farmers are in this country often considered as carriers of equality and a particular brand of Scandinavian road to modernity. However, quantitative studies of the wealth and inequality of Swedish farmers have been limited to very local studies, of a parish or so at a time. This paper contributes with the first comprehensive study of the wealth of the Swedish farmers, using a national sample of about 5,000 probate inventories for the benchmark years 1750, 1800, 1850 and 1900, of which about 1,750 inventories are for farmers. The paper maps the farmers' wealth positions in relation to other social groups as well as the stratification within the farmer class. I show that in 1750 and 1800 Swedish farmers were relatively equal, comparable to free farmers in the US North, but that inequality increased gradually and that in 1900 the Gini coefficient for the farmer class had risen to 0.74, as compared to 0.46 in 1750. The equality – at least in economic terms – of Swedish farmers has been overstated. Increased within-class inequality is driven especially by the increased number of farmers with very little land (in practice, semi-proletarians); the share of farmers' wealth held by the poorest half of the farmers decreases from 20 per cent in 1750 to only 4 per cent in 1900. Total rural inequality on the other hand is also driven by disproportionately rapid wealth growth among noble estate owners. I also discuss the role of regional differences in rural wealth, arising from differences in soil quality as well as transportation and proximity to urban markets.

Piotr Korys & Maciej Bukowski (Warsaw University)

Urbanization and the end of the 'second serfdom': Land reforms, abolishment of labour rent and the growth of towns in Poland in the nineteenth century

One of the most prominent Polish and European economic historians, Witold Kula indicated the second serfdom and other remains of the feudal economy as major barriers in modern economic growth in CEE countries, Poland in particular. Assuming that the 'second serfdom' was a crucial factor that determined backwardness of the region, the end of it should lead to internal mobility, growth of labour supply and, as a result transformation of the economy.

The end of the second serfdom on Polish lands happened in the nineteenth century. Legal freedom to peasants was granted in 1807 (in the Constitution of the Duchy of Warsaw), but labour rent was abolished much later, and this process was crucial for peasants' freedom. Abolition of labour rent and partial enfranchisement of peasants in the Prussian partition happened between 1821 and 1836; in Austria in 1848; and in the Congress Kingdom in 1864. Actually, only after abolition and enfranchisement were peasants able to migrate to urban areas (and abroad) on a larger scale.

The hypothesis that backwardness is connected to the second serfdom and other post-feudal institutions in the agriculture of Polish lands, while popular among social scientists until today, was not tested on quantitative data. A newly compiled database of the urban population of Polish lands gives a unique opportunity for such a test. The database contains information on the population of each of more than 1,400 towns and urban neighbourhoods which existed inside contemporary Polish borders in the nineteenth century in 8 time points: 1794, 1810, 1825, 1843, 1857, 1868, 1890 and 1910. Data are compiled from Adam Jelonek's database, Prussian and Austrian statistics, and census data from the Duchy of Warsaw (cf. Grossman 1925, Jelonek 1968). Missing data were interpolated. Data on population were also compiled from various data sources. Population data were subsequently recalculated into consistent data series for administrative units in 1900 borders. Each town was attributed to a proper administrative unit. For the analysis we have selected the territory of the Duchy of Warsaw: governorates of the Congress Kingdom of Poland and parts of the Prussian province Posen and the territory of Austrian Galicia.

We assume that urbanization on European peripheries in the nineteenth century was related to economic modernization, in particular to processes of industrialization and 'the start of modern economic growth'. That urbanization was usually a result of intersectoral LF movement, which was a key factor of economic growth. Based on above-mentioned database, we discuss two competing interpretations:

- (1) Enfranchising of peasants and the end of 'the second serfdom' (leaving institutional differences aside) should result in faster urbanization (in a form of either a change of level or dynamics). I expect that, in early phases, the growth of urban population covered small agricultural towns then spread to larger towns. Thus, structural change should have happened in Prussian areas between 1825 and 1843, in Austrian areas in 1857 and in Russian areas in 1868 or later.
- (2) It is also possible that other factors determined the urbanization of Polish lands. Most important of such factors was industrialization 'imported' from Western Europe, that started in the late nineteenth century. If that is true, the differences in urbanization dynamics between regions should be limited.

Early results show that some changes in the level of urbanization (and a jump in the size of urban population) were observed in two Prussian Regierungsbezirk between 1825 and 1843, as well as changes in Galicia after 1857. As for the Congress Kingdom governorates, most of the changes happened after 1868. Results basically confirm the impact of the end of 'the second serfdom' on the urbanization of Polish lands.

V/B Wealth, Poverty and Inequality in Pre-industrial Europe

Guido Alfani (Bocconi University)

The rich in historical perspective: Evidence for preindustrial Europe, c.1300-1800

This paper provides an overview of long-term changes in the relative conditions of the rich in preindustrial Europe. It covers four pre-unification Italian states (Sabaudian State, Florentine State, Kingdom of Naples and Republic of Venice) as well as other areas of Europe (Low Countries, Catalonia) during the period 1300-1800. It makes use of the data about wealth distribution collected by the ERC-funded project EINITE-Economic Inequality across Italy and Europe 1300-1800. In all cases excepting the Low Countries, the data come from property tax records like the famous Italian *estimi*. For the Low Countries, rental values of houses are used.

Starting with these data, three different kinds of indicators are measured systematically and combined in the analysis: headcount indexes, the share of the top rich, and richness indexes. Taken together, they suggest that overall, during the entirety of the early modern period the rich tended to become both more prevalent and more distanced from the other strata of society. The only period during which the opposite process took place was the late middle ages, following the Black Death epidemic of the mid-fourteenth century. For example around 1500, in Italy the rich (defined as those households owning at least 10 times the wealth of the median household) were about 3-5 per cent of the total population. By 1800, their prevalence had doubled. In the same span of time, the share of wealth held by the top 10 per cent had grown from about 45-55 per cent to about 70-80 per cent.

The wealth of new information provided for the late medieval and early modern periods also places in a somewhat different perspective recent findings about how the conditions of the rich have changed in the last two centuries. There seems, indeed, to be solid enough ground to argue that the tendency for wealth to concentrate in few hands in nineteenth-century Europe was in fact only the final part of a much longer process, which had started around 1450. In particular, the share of the top 10 per cent which I reconstructed for 1800 seems to have approached the European average at 1810, which recently Piketty placed at slightly over 80 per cent. Consequently, the time series presented here serve to extend by about five centuries current debates on very long-term changes in economic inequality and in the relative position of the rich.

Francesco Ammannati (Bocconi University) & **Wouter Ryckbosch** (Free University Brussels)

The prevalence of the poor in early modern Europe: comparing Italy and the Low Countries

The extent of poverty in the pre-industrial world is an important point of contention in the ongoing debates on the roots of the 'little' (intra-European) and 'great' (global) divergence: see for instance Allen's 'Progress and Poverty in Early Modern Europe' (Allen 2003) or Vries' 'Escaping Poverty: The origins of modern economic growth' (Vries 2013). However, despite this apparent interest in the topic, and despite the recent efforts to measure the course of GDP per capita (Broadberry et al. 2015), living standards (Allen et al. 2005), and inequality (Alfani & Ryckbosch 2016) in the long run, no similar systematic studies of the regional differences and evolutions in the extent of poverty across pre-industrial Europe are available.

One of the main reasons why systematic empirical studies on poverty remain scarce follows from the multitude of conflicting definitions of the term. The use of a single 'absolute' poverty line – preferably based on a close approximation of the biological subsistence minimum, such as the \$1 line – as used by many economists today runs into problems of relevance when projected onto the more distant past, when the majority of society fell below today's poverty line. On the other hand, most sociologists and policymakers have

explicitly adopted 'subjective' definitions of poverty, whereby the poverty line is defined relative to median living standards, or to subjective criteria of societal inclusion. Since such subjective norms differ over time and across space, it is by definition difficult to adopt in a long-term comparative study.

This paper aims to overcome these problems by juxtaposing three different definitions of poverty, characterized by varying degrees of subjectivity: the fiscal poor, the 'destitute', and those below the relative poverty line (compared to the median income level). All three definitions capture different aspects of 'poverty' in early modern society, and are to varying degrees determined by the same sort of relativity that characterizes today's poverty definitions. Yet when taken together, these measures present a measure of the extent of poverty in a given society that takes into account the standards of the time and place studied, yet at the same time is based on principles that are sufficiently general to allow for systematization and comparison across time and space. Based on new archival evidence, we compare the extent of poverty in Italy and the Low Countries from the late middle ages until the nineteenth century. The ultimate goal is to examine whether the evidence on GDP/capita and real wages that has suggested the occurrence of a 'little divergence' between both regions during the early modern period, also resulted in simultaneous divergence with regards to the rates of poverty.

Şevket Pamuk (Boğaziçi University)

Inequality of income and wealth in the Ottoman Empire, 1500-1800

This paper aims to present an overview of the existing evidence and suggest an agenda for future research regarding patterns of inequality of income and wealth in the Ottoman Empire during the period 1500 to 1800. It will adopt a comparative European framework and emphasize the similarities between the experiences of the Ottoman Empire and other parts of Europe, especially southern Europe. At the moment, the most important sources for the study of inequality in the early modern Ottoman Empire are wage and price series and probate inventories that provide evidence on changing patterns of urban wealth in different parts of the Empire.

Evidence from wage and price series is growing in recent decades that one of the most important developments influencing patterns of inequality in Europe during the late medieval and early modern era was the Black Death and the subsequent recovery of population. The same applies to the Ottoman Empire except that the plague did not disappear and continued to recur in the Ottoman Empire and around the Eastern Mediterranean until the early nineteenth century. As a result, population of the empire increased during the sixteenth century and then fluctuated around 20 million during the seventeenth and eighteenth centuries. Along with considerable regional variation, labour shortages persisted and wages declined slowly. Overall urbanization rates increased slowly from about 9 per cent early in the sixteenth century to about 16 per cent at the end of the eighteenth century. A long term trend of increases in per capita income did not exist before the nineteenth century. It is estimated that GDP per capita fluctuated around 2 times subsistence or 600 to 700 international 1990 US dollars during the early modern centuries. Inequality of income and wealth tended to be low early in the sixteenth century but Gini coefficients tended to increase slowly over time.

Another important cause of changes in patterns of inequality was institutions and government policies. Most important in this respect was the Ottoman land regime. The central administration supported peasant family farms and tried to prevent the emergence of large holdings but was not always successful. Tax collection and agricultural land began to be controlled more by locally powerful groups during the seventeenth and eighteenth centuries which also tended to increase inequality.

The paper will also suggest an agenda for future research on income and wealth inequality in early modern Ottoman Empire. It will emphasize the importance of gathering

more evidence and constructing additional long term series on wages, prices and wealth as well as focusing on the regional variations in patterns of inequality.

My earlier work on wages and standards of living in the early modern era: Özmucur and Pamuk, JEH, 2002; Pamuk, EREH, 2007; Pamuk and Shatzmiller, JEH, 2014.

Fernando Ramos Palencia (Universidad Pablo de Olavide, Sevilla) & **Esteban Nicolini** (Universidad Carlos III de Madrid)

New evidence about income and wealth inequality in pre-industrial Spain, c.1750

Research on the history of inequality in pre-industrial economies has focused mainly on either wealth or income inequality. The income distribution, usually reconstructed using social tables, tends to be imprecise in the top part of the distribution given that the variability of income within an occupational category is large. Distribution of wealth, usually using fiscal sources or probate inventories, is badly estimated in the bottom part of the distribution because of the important selection bias that arises from the fact that, in general, poor people are not included in these kinds of records. For these reasons, the results are not easy to compare and the links between the two distributions are difficult to establish. In this paper we use a unique dataset for different regions of Spain (Old Castile, New Castile and Andalusia) circa 1750 and present results (the first for any pre-twentieth century economy) of inequality of both income and wealth for the same sample of households. Information on wealth comes from probate inventories while information of income comes from the Ensenada Cadastre.

With this unique dataset we test the quantitative relevance of two main hypotheses: on the one hand, we study if labour incomes are larger relative to other sources of income in the bottom part of the distribution. On the other hand, we focus on the changes of the different components of wealth (land, livestock, buildings and urban properties, financial assets, money and consumption goods) across the different parts of the distribution. Finally, we study the relationship between income and wealth across settlements of different size and economic sectors. Our goal is to check the limits of using land or real estate as a proxy for wealth and wealth as a proxy for income.

V/C New Approaches to the History of Transport in England and Wales

Max Satchell (University of Cambridge)

A GIS of the navigable waterways of England and Wales, c.1600-1947: Introduction and applications

This paper concerns the first ever comprehensive time dynamic GIS (Geographical Information Systems) of the navigable waterways of England and Wales 1600-1947 produced by the author as part of his work on the Occupational Structure of Britain Project (PI Leigh Shaw-Taylor, Co-PI Tony Wrigley) The paper is divided into three sections: first, the GIS is described, and its capacity of the change in the network over time is demonstrated; the second section concerns geographical influences on what was, and could be made navigable has the capacity to enrich our understanding of the network; the third section probes the relationship between waterways and urban growth.

The first part of the paper introduces the waterways GIS describes its sources, how it was created, its data structure, accuracy and shortcomings and demonstrates its capacity to map and analyse the growth and contraction of the network from 1600.

The second section discusses how the waterways GIS combined with data concerning topography and hydrology have potential to enrich our understanding of the network. These data can be used in understanding the characteristics of rivers' basins and their rivers and the degree to which they are naturally navigable or had potential to be made so. In addition physical geography enables the characteristics of watersheds to be established and how much they represented both a physical and cost barrier that canals had to surmount if they are to go from one river basin to another. Amongst other things these data have the potential to model the plausibility of counterfactual traffic flows.

The final section concerns the relationship between urban growth and waterways. It has long been suggested that access to navigable water had a major effect on the capacity of a town to grow and profoundly altered urban geography in the eighteenth century. Put simply canals allowed towns located on or near coalfields to attract coal-dependent industries and the labour to serve them. Analysis of some 430 towns with a population of 5,000+ in 1831 shows that for towns to grow beyond a population of 10,000 they either had access to navigable waterways, the sea, or both. The paper concludes with a discussion of the degree to which this pattern reflects true growth or simply a trend whereby privileged towns which were already large were more likely to acquire a navigable waterway.

Oliver Dunn (University of Cambridge)

Coastal shipping and transport change in England and Wales, 1680-1830

The paper will address several questions relating to changes in coastal shipping in England and Wales between the mid-seventeenth century and approximately 1840. (1) How did the number and characteristics of ports change over time? (2) what routes did coastal ships take between ports? (3) To what extent did sailing times and coastal trade costs change? (4) What was the extent and form of productivity growth in coastal shipping?

We identify the number of ports around 1680 and 1830 using published and primary sources. Our aim is to go beyond primary 'customs ports' and identify the number of sub-ports as well. Some ports changed significantly in their capacity and technology. We identify those with parliamentary improvement acts, as this gives an indication where new works occurred.

There were zones where ships tended to travel. Heat maps for modern shipping maps broadly identify these zones. We have digitized the former to create preliminary maps for purposes of GIS modelling. As an extension we plan to use shipping logs to identify the routes for a sample of coastal ships.

The main value of coastal shipping was its low cost. This paper seeks to measure the average cost between all ports. Armstrong's pioneering work sheds light on coastal freight rates after 1830, but earlier times are less clear. Hausman proposed using differences in coal prices between Newcastle and London to infer the cost of moving coal between those ports by sea. The issue is that coal duties and loading fees get incorporated and so the price difference is a mixture of transport costs, taxes, and other costs. This is not necessarily damning because coal duties and other associated costs can be inferred from the sources

This paper proposes to enlarge Hausman's method to consider coal price differences between several ports. Houghton reports the market prices of coal in 55 towns between 1692 and 1702. Poor law reports document prices paid for coal in over 400 workhouses c.1835. In these two sources we isolate the prices of coal in port towns. We then identify the ports within a short distance of the major coalfields. Newcastle and Sunderland are the main two examples on the east coast. Next the shortest distance by coastal route is identified between each port town and the ports on the coal fields. Port pairs are then identified, one being a consumer and the other its sole supplier. As an output we can estimate the average coastal trade cost per mile at different points in time.

Coastal shipping's main disadvantage was its slow speed. Records of coastal bonds from the seventeenth century detail when a merchant posted a bond in the origin port and when customs certified their cargo in the destination port. The time difference is an indicator of the total travel time. For the 1830s we use a sample of coastal voyages from Admiralty coastal shipping records detailing departure and arrival dates. Overall we are able to assess changes in travel speeds alongside other developments in coasting transport.

Daniel Bogart (UC Irvine)

Road networks and transport change in England and Wales, 1680-1830

The paper will address several questions relating to road networks and transport change in England and Wales. (1) What were the characteristics of the main road network in 1680 and the main road network in 1830? (2) What was the state of wagon and carriage technology at these same dates? (3) How did road transport costs between towns change between 1680 and 1830? (4) To what extent was the road transport sector revolutionized in terms of productivity growth?

The characteristics of the network are revealed through new GIS data created by Max Satchell and Alan Rosevear along with colleagues on the Transport and Urbanization project at CAMPOP. At each date the road network has been digitized at a high level of geographic detail. The network maps show that total miles of main roads increased significantly, and moreover that the average distance between towns and their neighbours decreased significantly. The average elevation change between towns is also explored.

New technologies in road transport are relatively well documented in the literature. Here we add data on the diffusion of wheeled transport across towns in 1680 and the diffusion of later innovations like fly boats and stage coaches. The adoption of best practice vehicles provides a good indication of the level of technology.

The extent to which road transport costs changed between 1680 and 1830 is a crucial issue. In theory it depends on the evolution of road networks and technology across space. The paper focuses on the top 200 towns in terms of population in the early 1800s. It then uses GIS tools to identify the lowest transport cost route between all town pairs in the top 200. The underlying data are the network files and estimates of travel speeds per mile and freight rates per ton mile. The analysis also incorporates cost changes due to elevation and wagon or coach technologies associated with each route.

As an output, the analysis produces town-level estimates of travel times, freight costs, and passenger costs. The extent of change in each town is analysed along with an aggregate summary by weighting the average transport costs across towns. As an illustration, the main roads around Manchester in 1680 and 1830. The cost of travelling between Manchester and

Liverpool declined dramatically in part because the road network expanded, and because of the introduction of regular mail coaches between the two towns by the late 1700s.

One broader implication is that we can document to what extent road transport was revolutionized. One approach is to calculate productivity growth using price dual techniques. While such estimates have been computed before in the literature (e.g. Gerhold recently in the EHR), we are able to generate such figures at a town-level, and thus our analysis can shed light on regional as well as aggregate change. Our preliminary estimates show that productivity growth was substantial.

Eduard J Alvarez-Palau (University of Cambridge)

Multi-modal models of the transport network in England and Wales, 1680-1830

This paper will integrate information on roads, inland waterways, and coastal shipping into a single multi-modal model of the transport network. It will address the following questions: (1) How did the money and time cost of different transport modes compare in 1680 and 1830? (2) What was the cost of moving from one transport mode to another? (3) Which modes offered the cheapest or fastest service between the most important towns? (4) Considering all modes, how did general transport costs between towns change between 1680 and 1830?

The relative money and time costs of road, inland waterway, and coastal shipping are established using data from secondary sources and related papers in this session. This paper adds the transshipment cost, or the cost of loading at a coastal port, or waterway wharf. The costs are drawn from various sources and are incorporated in total transport costs.

The question of which mode offered the cheapest service is addressed using a multi-modal model. The model combines the GIS networks and transport cost parameters, like freight rates per mile and transshipment costs. It identifies the least cost route and the modes used. From these calculations we learn to what extent inland waterways displaced road transport, and for which towns. We also learn the relative costs of trading with large markets like London. We know coastal areas had a cost advantage in reaching London, but the degree is not clear, and nor is the pattern of change over time.

A final and important issue concerns the overall change in transport costs considering the choice between all modes. The paper focuses on the top 200 towns and calculates their average transport cost to other towns in 1680 and 1830. A summary average transport is then calculated across towns using population weights. The resulting change in transport costs can be compared with input prices in transport or the general price level. Preliminary calculations suggest that transport costs decreased relative to wages and fuel prices by a large amount, and indicate substantial productivity growth in transport.

V/D Banking and Finance

Masato Shizume (Waseda University)

Private banks vs. the Central Bank: Which really integrated the national financial market?

In this paper, I test the effectiveness of banking networks in integrating the national financial market. I focus on Japan during the late nineteenth century, when its financial system was in the process of modernization. I compare the effectiveness of: 1) networks operated exclusively by private banks and 2) the one operated by the central bank and its correspondent partners.

At the onset of financial modernization in the 1870s, the Japanese government considered two options: 1) to construct correspondent networks among private issuing banks, as in the United States, or 2) to construct a single network operated by the central bank and its correspondent partners, as in Europe. The Japanese government first decided to adopt the former because the Japanese economy was decentralized, as in the United States. After some trial and error, it switched to the latter and established the Bank of Japan (BOJ) in 1882. As a result, two types of networks co-existed during the early days of BOJ.

I construct a dataset comprising 1) the number of pair-wise relationships among banks, and 2) correlations in monthly lending interest rates at the prefectural level. The networks involve two kinds of relationships – the relationship between a bank and its branches, and correspondent contracts between banks. Regression analyses show that the correspondent networks of private banks helped significantly to converge interest rates among the prefectures. However, the correspondent network of the central bank and its partners did not significantly help to converge interest rates among the prefectures. Narrative analyses show that some of the leading private banks such as Dai-ichi Kokuritsu Ginko (the First National Bank) rigorously constructed their own networks to integrate the national financial market. They did so by building branches in regional financial centres and organizing other private banks as their correspondent partners.

These results reveal that the newly-established central bank did no better than private banks in terms of integrating the national financial market. This may have led the central bank to expand its own network of branches toward the end of the century.

Jonas Ljungberg & Anders Ögren (Lund University)

Exchange rates, catch up, and lagging behind in Europe since 1870

It is well known that a country, by manipulating the value of its currency, can push up its competitiveness in international markets. This notwithstanding, it is much overlooked how exchange rates have influenced economic growth and convergence of income among nations in a longer perspective. In particular have the consequences, under different exchange rate arrangements, of asymmetric trends of prices and wages in different countries been disregarded.

For example, in the period between the pegged exchange rates under Bretton Woods and the ‘irrevocably fixed exchange rates’ of the euro, there was a rapid convergence in Western Europe with catch up by countries such as Spain and Ireland. Despite the political aim to peg currencies, in practice this was a period of flexible exchange rates, due to frequent so called realignments of currencies. Had it not been for this flexibility, would the competitiveness of the catching up countries have been eroded by the faster increase of their wages and prices? Now the realignments compensated for the faster increase of wages and prices. On the contrary since 1999, among those countries which joined the euro, GDP per capita have diverged and the less rich countries have lagged behind. Hence, in the past half-century, catching-up by countries in Western Europe have benefited with flexible exchange rates and lost with fixed exchange rates. The question this paper aims to answer is whether this pattern holds true also in a longer perspective, and under different exchange rate regimes back into the late nineteenth century.

The real effective exchange rate (REER) captures the difference in the inflation rates and the nominal exchange rates and REER is the central indicator in our analysis. Official REERs exist only back to 1960 but the authors are currently, at the time of writing, finalizing REERs for more than fifteen European countries, most of which date back to 1870.

This paper is the first and preliminary analysis of this REER database, which is constructed from diverse open sources on nominal exchange rates, trade flows, consumer prices, and historical GDPs. By taking this longer and comparative perspective we are able to examine to what extent there is a sustained pattern between economic growth and the behaviour of the exchange rate.

Vincent Bignon (Bank of France) & **Maylis Avaro** (Graduate Institute Geneva)

Embedded money creation: monetary policy and Bank of France counterparty risk management in late nineteenth-century France

The last financial crisis underscores the importance of central banks' operational procedures to implement monetary policy. These details can impede the transmission of monetary policy and the absence of a system of monitoring of counterparties could have led to the denial of lender of last resort assistance (Ball, 2016).

We show how those operational procedures were crucial also in nineteenth-century France. To this end we gather quantitative and qualitative evidence from archival sources of the Bank of France to describe the system of information collection and of screening used to implement its monetary policy in its network of branches. We use archives from the head office and local branches to detail the procedures of supervision of the quality of counterparties. We check how this system was implemented with data on 1,665 individual presenters at any of the 94 local branches in 1898 with information on their identity, occupation, economic and social situations, wealth and financial position with the Bank.

Contrary to the argument in Goodhart and Capie (1994), our quantitative measures show that the Bank of France operated actually as the bank of banks at the end of the nineteenth century. Financial intermediaries represented 53 per cent of the presenters to the discount window but 84 per cent of the total discounted volume. This is further reinforced by the computation of the proportion of banks that presented discount with the Bank of France as a share of all banks in business, which is done by matching our database with the banks operated according to the commercial almanacs. We find that 30 per cent of all banks discounted at the Bank of France. Together with the fact that the Bank was the bank of the government, this established its role as the central bank. This however leads us to wonder at the rationale for maintaining the discount to non-financial traders. We argue that in an economy in which screening was relationship based between trade's partners, there was no clear delineation between banks and non-banks as shadow banks operated in the middle, often as an activity that grew out of traditional merchant activity.

We also contribute to the literature on risk management framework of central banks. We describe its sophisticated information system to acquire information on its clients and the rules of access of its discount windows set to protect its profits from the risks of default of counterparties. Contrary to previous literature (Nishimura, 1995), we demonstrate that the Bank took no more risk with its clients as the bills they presented were guaranteed either by their own capital or by pledged securities. Our qualitative analysis shows that the Bank also used social reputation to discriminate against the presenters of discount papers and that banks used more social capital than securities to guarantee their discounts.

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Olivier Accominotti (London School of Economics), **Delio Lucena** & **Stefano Ugolini** (University of Toulouse)

The origination and distribution of money market instruments: Sterling Bills of Exchange during the First Globalization

How are money market instruments produced by the financial system? Participants in financial markets need liquidity in order to transact; hence, the supply of liquid and safe monetary instruments is essential to the functioning of any financial system. Money market instruments however usually consist of private bank debts backed by risky collateral. Maintaining their liquidity therefore requires that no one questions the value of the collateral (Gorton, 2013; Gorton and Ordóñez, 2014). According to Gorton (2013), “markets are liquid when [...] no one knows anything about the collateral value and everyone knows that no one knows anything”.

A classic example of a highly liquid money market instrument is the so-called bill of exchange which was exchanged on financial markets from the medieval period through the midst of the twentieth century (King, 1936; de Roover, 1953; Flandreau et al., 2009). The bill of exchange was an instrument of international trade credit backed by risky private debts and traded at times of huge informational asymmetries and macroeconomic instability in the global financial system. Yet, it was the most liquid monetary instrument of its time (Warburg, 1910).

This paper explores how the informational problem inherent to the origination of bills of exchange was solved during the first globalization. We rely on a unique dataset constructed from a previously unexploited archival source (the Bank of England’s Discount Ledgers) reporting information on all agents involved in the origination of bills circulating on the London discount market – the world’s largest money market of the time. Our dataset contains information on all individual bills rediscounted by the Bank of England in 1906 (23,493 bills) and allows us to describe in detail the origination and distribution of sterling bills at the heyday of the first globalization.

Using network analysis, we reconstruct the complete network of linkages between agents involved in the design of London bills. Bills of exchange always involved a “drawer” (a borrower located either in Britain or abroad), an “acceptor” (a London firm which guaranteed the payment of the bill in pounds sterling at maturity), and a “discounter” (an investor who bought the bill on the London money market and was thus the ultimate lender). We construct two bimodal networks to analyse similarities and discrepancies in behaviour among lenders (discounters) and guarantors (acceptors). Our results reveal that lenders (discounters) exhibited strong similarities in their behaviour – they indiscriminately bought bills drawn from all types of borrowers (drawers) indicating that they did not question the value of the bills’ collateral. By contrast, there were only limited similarities in the guarantors’ (acceptors) behaviour – acceptors specialized in guaranteeing the debts of a few drawers with whom they had special relationships and on whom they had private information.

Overall, our findings demonstrate that the extensive information accumulated by acceptors/debt guarantors on a wide range of foreign merchants and firms was crucial for the functioning of the London money market. This ensured that private international debts could be transformed into high-liquidity, low-risk money market instruments traded throughout the whole international financial system.

V/E Women's Committee Session: Occupational Change from a Gendered Perspective

Jane Whittle & Mark Hailwood (University of Exeter)

The relationship between occupations and tasks: a perspective from the Women's Work in Rural England, 1500-1700, project

This paper will draw upon the data being gathered by the 'Women's Work in Rural England 1500-1700' project to explore the issue of occupational change in England from an early modern perspective. Our project investigates the history of both women's and men's work in this period by prioritizing incidental evidence of specific work tasks undertaken by individuals – as recorded in a variety of court depositions – over and above the use of occupational descriptors. Nonetheless, where it is provided we do record the occupational titles of our actors, and this allows us to make a number of contributions to debates about the occupational structure of early modern England.

Firstly, we will present our data on the range and prevalence of occupational titles recorded within our database and compare these with the findings of CamPop's 'Occupational Structure' project and with Alex Shepard's recent work in 'Accounting for Oneself', as well as considering the evidence for any significant changes across our period. Arguably the most significant conclusion to be drawn from such data is the limited value of using occupational descriptors for studying the history of women's work, so rarely were they accorded to women (though we will discuss the few examples that were common in our period). Instead, we adopt a task-based approach that is far more inclusive of women's work activities, but we also want to argue here that a task-based approach raises serious questions about the utility of occupational titles as guides to men's work activities. Secondly, then, by comparing the occupational titles accorded to men and women with the specific work tasks they are recorded as doing we will interrogate the nature of the link between the two, and argue that the former is a problematic guide to the latter for this period. As such, historians need to think much more carefully about what an occupational title meant – for both men and women – between 1500 and 1700, if we are to fully understand the nature of occupational change, and indeed the changing nature of work, both within and beyond the early modern period. Thirdly, we will attempt to demonstrate the value of a task-based approach by comparing our own data with that of Ogilvie ('Bitter Living') and the Swedish 'Gender and Work' project, demonstrating that a task-based approach can reveal important differences in the gendered division of labour across time and space.

Beatrice Moring (University of Helsinki / CamPop)

Women, textile work and the family economy in eighteenth-century Stockholm

The nature and structure of economic statistics make calculations of female economic activity and contributions to the family economy difficult. While many women were active in the seventeenth and eighteenth century agrarian economy, a large proportion was non-paid family labour and therefore hard to measure (Sharpe 2007; Pichbeck 1930). In a recent publication Humphries and Weisdorf have tried to measure female labour market participation in the long term, as well as levels of remuneration in relation to male earnings. This study seems to indicate that considerable differences can be gleaned in the availability of work opportunities over time, as well as in the availability of full time in relation to casual work (Humphries and Weisdorf 2014). It has also been demonstrated that variation on community level in Britain could be considerable and activity levels of over 50 per cent have been detected in some areas (Wall 1986; Wall 1994). On the other hand, however, the registered labour market participation of married women in the nineteenth century varied radically between European countries (Simonton 1998).

Another issue, relevant to the present contribution, is the question marks that have arisen around male wages. For too long it has been the norm to multiply a day wage and assume full and continuous employment for men. More recently queries have been raised around the basis for these calculations and some of the data on which they rest (Humphries 2013; Stephenson 2014).

Calculations of male earnings in Finland around 1900 have revealed that the ability of a casual labourer to feed his family was debatable. Manual work, for example the building sector, was traditionally plagued by seasonal unemployment, because of weather conditions, and there is no reason to assume that this was not the case in earlier centuries (Hjelt, 1911; Heikkinen 1997; Moring 2010).

The aim of this presentation is to tackle the question of harvesting information about female economic activity using sources other than occupational statistics or censuses. The present study will concentrate on an urban area, i.e. the town of Stockholm in the eighteenth century, and the sector that will be targeted is that of textile manufacture.

Using data on female income from textile work, the aim is challenge the assumption that women in the past were passive non-productive family members. The intention is to demonstrate that women had the ability to make relevant contributions to the family economy. It is also the aim to question some assumptions made about male earning capacity, among casual labourers, or even men with specific skills. The information is gleaned from accounts held by companies engaged in textile manufacture in mid-eighteenth century Stockholm and from studies on income, prices and economic life in the town.

Ushehwedu Kufakurinani (University of Zimbabwe)

White women and the changing colonial labour market in Southern Rhodesia

Gender and imperial studies are a recent development in scholarship. There has been growing interest in re-enacting the history of colonial/imperial/white women in the colonies understanding the nature and impact of their roles (Kate Law 2016, 2024; Kufakurinani 2013, 2015). Despite this growth, there remain several grey areas on the historical experiences of white women in the colonies. For instance, we know very little about the experiences of these women within the colonial labour market. The colonial public service, for example, was one of the greatest employers of white women's labour and in the Southern Rhodesian case, archival documents exist that show how women's labour power was appropriated and exploited. Using this rich archival documentation, this paper makes a qualitative examination of a number of dynamics surrounding white women's participation in the labour market which, to all intents and purposes, assaulted the dominant domestic ideology that ideally confined women to domestic spaces. The changing market forces triggered by such events as the First and Second World Wars forced the colonial patriarchal system to make concessions to women's 'invasion' of public spaces in unprecedented volumes. This invasion, however, remained entrenched in a domestic ideology reminding women of their normative roles. This is why, for example, it took over 60 years for married white women to be legally accepted into full employment in 1971, otherwise they were expected to either stop work or be employed as temporary full time. Even then, it took longer for society to adjust to the new legal parameters. The paper also examines debates that intensified from the 1950s about women taking up careers as opposed to housewifery. Using the case study of the public service of Southern Rhodesia, the paper will also analyse the changing conditions of service and women's efforts to negotiate and contest gender inequalities and gender biased labour practices.

Elise van Nederveen Meerkerk (Wageningen University)

Unravelling the impact of Colonial connections on both Javanese and Dutch women's work, 1830-1940

In recent years, post-colonial and post-nationalist studies have designed a research agenda allowing for dynamic and reciprocal analyses of colonial interactions. This scholarship opposes the widespread idea of the nation as a self-contained unit of analysis and the teleological notion that developments in Western Europe and Northern America form blueprints for other societies and cultures on their “road to modernity”. Moreover, it argues that we can only understand the histories of both “the West” and “the Rest” by studying them interrelationally, through the approach of *histoire croisée*, or entangled histories. By nature, this approach crosses borders, not only geographically, but also interdisciplinary, as it draws inspiration from cultural history, anthropology, and postcolonial studies, to mention just a few. This contribution aims to bring two other disciplines into focus, economic – and more specifically: labour – history and gender studies, that have thus far hardly been studied in tandem. By applying the method of entangled histories, the decisive impact will be revealed of colonial connections and transfers on women's economic activities and changing household labour relations in both a metropolitan and a colonial context: the Dutch Empire between circa 1830-1940. The division of work between men, women and children, both in the Netherlands and in the Netherlands Indies, was not only a result of households' allocations of tasks in everyday life as well as local and ‘national’ customs and ideologies, but was also – directly or indirectly – impacted by colonial connections. Categories of gender, age, class and race were partly shaped and defined exactly by contemporaries' perceived differences between men, women and children in metropolis and colony. This led to strikingly different practices and policies, in the sense of tax burden, living standards, and socioeconomic and labour legislation in both parts of the empire, in all of which household labour formed a constitutive element.

V/F Finance in the Twentieth Century

Duncan Needham (University of Cambridge)

Which M for emphasis? The origins of broad money supply targets in the UK, 1861-1981

The British monetary authorities have traditionally focused on ‘broader’ measures of the money supply than their counterparts elsewhere, particularly in the United States and Germany. The historical reasons include: the idiosyncratic UK approach to managing the national debt, exchange rate policy, the traditional willingness of UK banks to allow customers to make payments by drawing on their time deposits, and the ‘flow-of-funds’ system of national accounts developed after the Second World War. This paper outlines these reasons, and explores the implications for the UK’s fractious relationship with the International Monetary Fund during the 1960s and 1970s. IMF loan conditionality traditionally relied on ‘narrow’ monetary targets, particularly relating to the central bank’s balance sheet. Despite being the largest user of IMF resources during this period, the UK authorities succeeded in having conditionality applied to their traditional broad monetary aggregate. This had profound implications for economic performance in the early 1980s when the Thatcher government placed broad monetary targets at the heart of macroeconomic policy. The consequence was the deepest recession in the UK since the 1930s.

Dimitris Sotiropoulos & Janette Rutterford (Open University)

Diversification in the UK during the first globalization era: evidence from individual investor portfolios

From the 1870s there was an increased awareness among UK investors of the benefits of financial diversification – primarily putting equal amounts into a number of different securities – with much of the emphasis being on geographical rather than sectoral diversification and some limited discussion of avoiding highly correlated investments. While there has been some research at the macro level of whether UK investment abroad during the period up to World War I was optimal or inefficient in a Markowitz risk-return sense, this study is the first to use historical information at the micro level investigating actual portfolios of both individual investors. It analyses diversification strategies of individual investors based on actual portfolios containing 2,316 individual securities, held by a sample of 508 British investors at death in the period 1870 to 1902. It examines to what extent diversification choices at the investor level were related to investor characteristics and/or sophistication proxies. It also analyses and compares these findings with the portfolios of a sample of 35 UK investment trusts before WWI. On average, the financial assets amounted to about 60 per cent of the total wealth of individual investors and investors held between 4 and 5 securities in their portfolios. The mean individual holdings were just two, a sign of poor diversification. However, Victorian investors compared rather well to contemporary household decision making. Diversification is related to wealth; the coverture status of women influenced their financial behaviour and Londoners were more inclined to send capital abroad. However, there does not seem to be a foreign bias in individual portfolio selection contrary to investment trust portfolios.

Keywords: diversification; overseas investment; Markowitz; portfolio optimization; correlation.

Lu Zhang (Ryerson University) & **Randall Morck** (University of Alberta)

Creative destruction and idiosyncratic stock return variation in the Roaring Twenties and the Great Depression

Technological progress is associated with Schumpeter's (1911) process of creative destruction: creative new firms successfully apply new innovations, partially or completely destroying the old non-innovative firms. This widens valuation gaps: investors boost their valuations of technology-winner firms or industries and reduce their valuations of technology-loser firms or industries.

A decomposition of individual stock return variances reflects this valuation gap. Stock return variance is decomposable into market-related variance, stock price movements correlated with market indexes; industry-related variance, variation correlated with industry indexes; and idiosyncratic or firm-specific variance, residual return variation uncorrelated with either index (Roll, 1988; Morck et al. 2000; Campbell et al. 2001). Creative destruction that widens investor valuation differences between winner and loser firms would boost industry-related and idiosyncratic return variation relative to market-related variation.

We explore this hypothesis with historical economy, industry, and firm-level data for the 1920s and 1930s, decades of intense innovation. The 1920s saw an IPO and stock market boom in which electricity served as a new general purpose technology. New glamour industries such as automobiles, chemical products, and mechanization fed into innovation in other industries. Despite the sharp 1929 downturn, multifactor productivity continued growing rapidly well into the 1930s (Field, 2003). We therefore explore both decades.

In the past century, we observe unusually high idiosyncratic stock return variation in the 1920s, the 1960s, and the 1990s, eras of intense innovation. Each is associated with a new general purpose technology: the 1920s with electrification, the 1960s semiconductors and plastics, and the 1990s with the information technology revolution. This evidence supports the thesis of Schumpeter (1911) that higher income countries sustain higher incomes because their financial markets foster faster paced creative destruction.

With a novel dataset of firm-level patents and patent citations, we find that the stocks of firms that accumulate more patents in 1920's high-tech sectors exhibit higher idiosyncratic stock return variation, consistent with a wave of creative destruction widening performance gaps between successful innovators and laggard firms whose value is partially destroyed. The effect is prominent in electricity firms only in the 1920s, consistent with the wave originating there. These results persist into the 1930s, suggesting ongoing innovation-related disruption. Similar findings emerge from firm-level regressions using patent citations, rather than patent accumulation, to measure innovation intensity. Further tests gauging innovation by industry-level patents, labour productivity growth, research staff, and electricity usage affirm these findings, as do tests using big business turnover to gauge extreme creative destruction.

Our findings support the new endogenous growth theory (Romer 1990) as describing the 1920s and 1930s well. In addition, our findings highlight models of technological progress via creative destruction (Aghion and Howitt 1992, 1998; Acemoglu et al. 2006) that elevates firm performance heterogeneity (Pastor and Veronesi 2009) as especially resonant with the data in these decades. Third, our findings support the thesis that, like information technology (IT) in the 1990s, electricity in these decades was a general purpose technology: a technology that creates scope for widespread innovation outside its own industry.

Natacha Postel-Vinay (London School of Economics), **James Cloyne** (UC Davis) & **Nicholas Dimsdale** (University of Oxford)

The impact of fiscal policy on interwar British growth: A narrative approach

Inheriting a heavy debt burden from World War I, Britain conducted a policy of fiscal austerity throughout most of the interwar period until rearmament. Neither recessions in the 1920s nor the Great Depression itself could induce policy makers to diverge from their conservative budget line. Some have asked whether expansionary fiscal policies could have had a positive impact on Britain's growth path and alleviated the debt burden, as JM Keynes would have suggested. Whether this could have been the case depends on the size of the fiscal multiplier at the time. Looking at the impact of unexpected changes in war expenditure on GDP, Crafts and Mills (2013) estimated this fiscal multiplier to be relatively low, implying no significant missed opportunity. By contrast, Romer and Romer (2010) and Cloyne (2013) found relatively large fiscal multipliers for post-1945 America and Britain respectively. They applied the so-called "narrative technique" pioneered by Romer and Romer (1989), which consists in wide-ranging historical and contextual research aimed at isolating those tax changes that can be deemed exogenous, and examining their impact on GDP. Early reading of interwar budget decisions suggests a range of idiosyncratic variation in tax rates around the gradual debt redemption plan. In this work we thus apply a similar method for the whole interwar period, making use of extensive biographical and archival material such as Chancellor Budget Speeches and Parliamentary Papers, and linking them to quarterly tax and GDP series.

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V/G Height and Health

Nikola Koepke, Joël Floris, Ulrich Woitek, Frank J Rühli & Kaspar Staub (University of Zurich)

Swiss net nutrition since the late eighteenth century

Studying net nutrition as a fundamental dimension of a population's well-being (WHO 1995) provides useful insights to the economic-social-historic research.

Essential to consider in studying net nutrition, though, is that its outcome is closely interrelated to socio-economic status, identity as well as to cultural and social behaviours. Thus, not only societies with class- or ethnicity-related discrepancies, but also a differentiation of gender roles bear the danger to have an adverse effect (Oxley, Tawney Lecture 2013).

As historic societies were mostly patriarchally structured, any occurring gender-related inequality tends to affect the females. Concerning potential female discrimination, extreme conditions can even result directly in femicide (Olds 2006; Klasen & Wink 2002). Apart from that low female status can manifest in a general neglect of females in public endowment and household allocations, including diet and health aspects. Correspondingly, pronounced disparity can result in an unequal net nutritional status for male and female contemporaries affecting height dimorphism: in addition to the always present basic sex-specific differences, gender-specific variation can occur. Moreover, inequality can result in health disparities during growth and later in life (Harris et.al. 2009; Moradi & Guntupalli 2009; Bogin 1999; Frongillo & Begin 1993; Sabir & Ebrahim 1984; Eveleth & Tanner 1976). And an extended burden of malnutrition in females can even bear the danger of epigenetic changes affecting the mean height of the whole next generation (Currie & Vogl 2013; Osmani & Sen 2003; Barker 1995). These potential influences should be taken into consideration, analogous to socio-economic effects, when studying the net nutrition of a population.

Previous anthropometric research on historic Europe indicates that inequality prevailed at the expense of entitlements and investment in females due to factors related to an imbalance in prospects, including, in particular, the bread winner positioning (Horrell et al. 2009); correspondingly, the gender bias can become an earner bias (Meredith & Oxley 2015).

How have the conditions been in Switzerland since the late eighteenth century? Did socio-economic or regional differences exist? And did females, and if so to what extent, experience a particular net-nutritional discrimination? Did changes occur in the course of time?

In attempting to answer these questions, we study anthropometric data from different Swiss sources for the birth cohorts through 1760s to 1930, comparing data on men (Staub et al. 2016) with information on women that we compiled from convict registers, passport applications, military recruitment, and a maternity hospital (in total N=26,500). Besides the potential male-female differences we also consider possible socio-economic as well as regional differences within the females. First results indicate that males and females experienced the secular trend with a similar trajectory in mean adult height, and that regional as well as class-specific differences can be found within both.

Eric Schneider (London School of Economics) & **Pei Gao** (NYU Shanghai)

The economics and biology of shifting growth: The growth pattern of British children, 1850-1975

The growth pattern of British children has changed substantially over the past 120 years (Cameron, 1979). Children in the late nineteenth century grew at a slower velocity, experienced a delayed pubertal growth spurt, and grew for longer than children today. Adult males were also 11 cm shorter on average in the past. However, despite the limited cross-sectional evidence of a general shift in the growth pattern, previous research has not been able to pinpoint when these changes occurred or what might have caused them. This paper analyses growth records collected for boys born between the 1850s and 1970s while they were enrolled on the training ship ‘Indefatigable’ based in the river Mersey. The ‘Indefatigable’ dataset is novel for two main reasons: it provides individual-level information on boys’ anthropometric measures and socioeconomic status across the second half of the nineteenth and twentieth centuries and it provides longitudinal measurements of the boys’ growth since they were measured at admission and discharge from the ship. This evidence allows us not only to study how children’s height at a particular age changed over time, but also to look at how the growth velocity of children changed. We find that although there were modest improvements in children’s heights at admission beginning from the 1850s, the largest increases in height occurred in boys born from the 1910s to the 1940s. This drastic improvement during the interwar years is somewhat puzzling but matches Hatton’s (2014) findings comparing adult heights around Europe. The results for growth velocity are more striking. Controlling for individual characteristics, we find that children born before the 1910s decadal birth cohort did not experience a strong pubertal growth spurt. The growth velocity of boys aged 12 to 17 was roughly similar and was at low velocities compared to modern populations. However, beginning in the 1910s birth cohort, a strong pubertal growth spurt appeared with children experiencing faster growth. There is also evidence that the pubertal growth spurt began to shift backwards in the first half of the twentieth century. These patterns are very interesting but discovering their cause will require more data analysis in future papers. The fact that many of the changes occurred in the early twentieth century suggests that reductions in child morbidity may be especially important. Slow improvement in boys’ heights and no change in their growth pattern during the second half of the nineteenth century when living standards were improving dramatically also suggest that higher living standards do not plainly map onto changes in children’s growth.

Gregori Galofré-Vilà (University of Oxford) & **Bernard Harris** (University of Strathclyde)

Birth outcomes, intergenerational transfer of health and early life mortality in Barcelona, 1905-20

Although perinatal and adult health have tremendously improved in the Western world over the last 150 years, there is no strong evidence that foetal health (as measured by changes in birth weight) has changed. In this paper a rich new dataset from 1905 to 1920 from the *Casa Provincial de Maternitat i Expòsits de Barcelona* (the Provincial House of Maternity and Foundlings of Barcelona) has been exploited with a range of multiple foetal health indicators (including the baby’s sex, birth weight, birth length, placental weight, head circumference, etc.) and maternal health profiles (with the details of the mother’s height, weight at last week of pregnancy, pelvis size, place of birth, occupation, number of births, etc.) to explore changes of health in utero, and the intergenerational transfer of health between the mother and the new-born. We find that while birth weight and length scarcely changed over time, placental weight can be used as a good indicator of foetal development. Indeed, placental weight changes according to the environmental conditions outside the womb, as occurred during the typhus epidemic of 1914 in the city of Barcelona or the influenza epidemic of 1918, and interestingly, over the course of the last century placental weight has declined by 6-7 per cent. Using adjusted models and controlling for maternal health, results show that

maternal weight and pelvis size are very important for foetal development, and by applying the Cox proportional hazards model we find that higher birth weights and lengths as well as taller mothers diminish neonatal mortality.

Matthias Blum (Queen's University Belfast) & **Claudia Rei** (Vanderbilt University)

Escaping the Holocaust: human and health capital of refugees to the United States, 1940-42

The large-scale persecution of Jews in the context of World War II generated massive refugee streams in Europe. From the Nazi seizure of power in January of 1933, to the invasion of Poland in September of 1939, restrictions and threats on Jewish life and property in Germany became all too prevalent. The expansion of Nazi Germany further set in motion those who feared for their lives and could afford to flee. By the summer of 1942, when German troops reached Stalingrad, the Nazi territorial grip over Europe was nearly complete.

We assess the human and health capital of Europeans arriving in the United States between 1940 and 1942. The majority were Jewish refugees and their families escaping Nazi persecution and expanding war. They were the last to escape the Holocaust. We construct a dataset based on ship manifests, containing detailed information on all alien passengers arriving at the Port of New York and departing from Lisbon, the only European port with regular passenger traffic to the Americas after June of 1940 when the Nazis expanded through most of Western Europe.

We use the human stature of adult passengers as a proxy for the human and health capital these passengers carried. We divide passengers according to sex, nationality, and refugee status and compare their average height with that of the population in corresponding source countries. Refugees from most nationalities were taller than source populations suggesting positive selection, which is more pronounced in women. Non-refugees were taller than refugees and therefore even more positively selected, a sign of their different travel motivations. Refugees were pushed out of Europe and, if they had time, liquidated all their assets so that they could get to Lisbon and purchase a ticket to leave Europe. Non-refugees on the other hand, probably belonged to the limited segment of society that could afford international travel in the early 1940s, which is likely to be associated with higher income, skill, and human capital levels.

German nationals are the most represented in our data and show a lower degree of positive selection when compared to other nationalities, both in males and females. This finding is unsurprising since many Germans, possibly carrying higher levels of human capital, had left Europe before 1940 due to the increased restrictions on Jewish life in Germany since the Nazis' seizure of power in 1933. Similarly, in the early twentieth century, Jewish emigration resulting from pogroms in the western Russian Empire may explain the low degree of selection of individuals from modern-day Latvia and Poland (Spitzer 2015). Conversely, there is no reason to assume that Jews living outside Nazi controlled territory had left Europe in very large numbers before the outbreak of war in 1939, even though some could have taken that pre-emptive step. Accordingly, we observe large differences in height for countries that came under German influence after the outbreak of war. We believe that the differences in observed selection among refugees exiting Europe via Lisbon during 1940-42 are partly the result of different waves of migration since many Jewish-Germans, Jewish-Poles, and Jewish-Latvians left Europe before Jews of other nationalities.

We further investigate the reasons behind the height differences between refugees and non-refugees and confirm well-known features of migrant selection mechanisms. First, early migrants were taller than late migrants, suggesting that on average more well-off individuals migrated earlier than the period we analyse. Second, a large migrant stock, for example of early migrants that had left Germany after the Nazis took power in 1933, but also German-Americans in general, may have provided for less privileged followers, possibly via the postage of bonds in the destination country, thereby reducing the barriers to and the perceived

risk of migration. Third, passengers sponsored by an individual outside their family circle, were substantially shorter than those who could afford the passage themselves.

Higher income and skill backgrounds are associated with taller heights for all passengers regardless of refugee status: despite the urgent need to escape Europe, refugees responded to economic incentives and opportunity costs just like other passengers. Changes in migrant selection however, did vary over time across sex and refugee status. Male refugees with visas issued later were significantly shorter than non-refugee males, whereas in females this is true regardless of refugee status. Additionally, females that were prior migrants in Europe before departing to the US were taller than females whose country of birth coincided with the country of last residence, but such pattern does not hold for males. The exploration of the different selection patterns between males and females is left for future research.

V/H Technology and Returns to Skill

Alexander Donges (University of Mannheim), **Jean Marie Meier & Rui Silva** (London Business School)

The impact of institutions on innovation

In this paper, we study the long-run impact of institutional reforms on innovation in Germany. We use the timing and geography of the French occupation of different regions after the French Revolution of 1789 as an exogenous shock to the institutions of those regions. Based on a novel county-level dataset for Imperial Germany, we provide evidence that counties whose institutions were more inclusive as a result of the French occupation became more innovative in the long-run. In our model, the institutional reforms that are associated with moving from a county with no occupation to a county with the longest occupation result on average in a 129 per cent increase in the number of patents per capita. Additionally, we investigate whether the impact of institutional reforms is weaker in counties where potential impediments for the effective implementation of such reforms existed. Our results show a weaker effect in counties that were part of ecclesiastical states before the German mediatisation of 1803. Furthermore, we analyse different types of patents separately. For patents in chemistry and electrical-engineering, the high-tech sectors of the late nineteenth century, we observe a stronger effect.

Our results are robust to different model specifications including various geographical subsamples and different reform measures. Furthermore, we discuss and test a series of alternative channels that could explain why counties that had been occupied by the French became more innovative in the nineteenth century. In particular, we rule out the concern that our results are driven by differences in the local availability of natural resources (especially coal) and differences in the degree of industrialization. Market integration could be another channel that fostered innovativeness since the French occupation triggered the territorial reorganization of German States by the dissolution of small, formerly political independent states. However, the effect of reforms remains strong if we include proxies for market integration. Further tests take regional differences in human capital and the local provision of financial services into account.

The findings of this paper point to institutions as a first order determinant of innovation and highlight the role of innovation as a key mechanism through which institutions may lead to economic growth.

Christopher Minns, Patrick Wallis & Sandra de Pleijt (London School of Economics)

Technical change and human capital investment: Evidence from the industrial revolution

Is human capital a complement or a substitute to technical change? This question has been of long-running interest to both economists and economic historians. This paper explores the connection between technical change and skill formation in a particularly interesting and important context: England on the cusp of the industrial revolution. In the late eighteenth century, new technologies, particularly in the form of steam-based power sources capable of fuelling large-scale production units, were beginning to be adopted around England. The adoption of such power sources had the potential to shift the returns to skilled relative to unskilled labour, causing those seeking education or training to respond to changed incentives. We use highly detailed, recently digitized apprenticeship records to document whether such a response was present prior to 1800.

Apprenticeship is of interest in this context for several reasons. First, it has the obvious potential to offer the professional and advanced technical skills that have been identified as key to the success of the industrial revolution (cf. Mokyr 2005; Mokyr and Voth 2009; Meisenzahl and Mokyr 2012, Squicciarini and Voightlander 2015). Second, guild-based apprenticeships were intended to be local qualifications: if the presence and spread of power technology had local effects on the expected return to acquiring skill mainly where

such technology was in active use, it should show up in the pattern of apprenticeship training more than in other forms of human capital formation. Finally, the data collected from the registers of the Stamp Tax (see Minns and Wallis 2013) provide enough detail on the timing and origin of new apprentices to construct a panel dataset on inflows into training. This means that unlike other recent studies that have examined cross-sectional relationships between technology and skill (Frank and Galor 2016; de Pleijt, Nuvolari and Weisdorf 2016), we can show how decisions to train respond to technological presence net of any local (county or sub-county) fixed effects.

In our preliminary regressions, we have focused on county-level models of apprenticeship inflows against the (annual) presence of a steam engine. Across a range of specifications, we consistently find a negative, statistically significant, and economically substantial relationship between apprenticeship inflows and the arrival of steam between 1750 and 1800. This finding runs counter to recent cross-sectional studies that show counties with greater adoption of power technology also had higher levels of educational attainment (Frank and Galor 2016; de Pleijt, Nuvolari and Weisdorf 2016). When separating the apprentice population into several occupation groups, among the strongest effects are seen for “mechanical” apprentices, whom many have argued had the technical skills that were complementary to the new technologies that were emerging in the second half of their eighteenth century (Mokyr 2005).

By the time of the EHS conference, we will significantly extend the analysis by incorporating (1) new time-varying measures on other forms of human capital and (2) sub-county models based on ongoing geo-coding of both steam engines and the location of apprentices.

Jorgen Modalsli & Stefan Leknes (Statistics Norway)

Hydroelectricity, return to skill, and individual mobility

Technological changes that make the exploitation of natural resources possible might have substantial effects on the local economy, even more so in a historical setting with structural transformation from a mainly agrarian society to a more diverse industry mix. The changes in the business environment might be a rising tide that lifts all boats, or bring possibilities to those able and leave the less resourceful behind. The changes in the economic conditions might entail increased occupation mobility, provide an advantage in the regional competition for workers and contribute to income inequality. However, due to the gradual development of technologies, it is often not feasible to pinpoint exactly how the relationship between technological development and return to skill operates. Moreover, as industries are likely to develop first where the most appropriate supply of labour can be found, it can be hard to disentangle selection effects of industrial production from the actual impact of changes in capital or technology.

This paper uses the development of a technology that emerged at the turn of the twentieth century – the production of electricity by hydroelectric plants – to explore the relationship between technology and resource windfalls, industrial development, occupation structure of the local economy and the spatial mobility of workers. A key feature of the research design is the highly localized nature of hydroelectric production and therefore makes it natural to compare outcomes across municipalities that differ in natural resource endowments.

The present study has two major innovations compared to previous studies. First, we combine a comprehensive account of the development of hydroelectric plants in Norway from 1893 onward with full-count individual census data for 1900 and 1910. Linkage of individual person records makes it possible to take into account the geographical and social background of individual workers, rather than relying on aggregate employment shares. Second, we aim to instrument the construction of hydroelectric dams using data on the geographical

characteristics of Norwegian municipalities, including high-resolution elevation data, river slopes and river volume flows.

Preliminary results show clear evidence of higher population close to areas with hydroelectric production. Moreover, municipalities in which hydroelectric dams were established experience higher growth in manual skilled occupations between 1900 and 1910 compared to other municipalities and other occupation groups. The association is maintained if we only consider municipalities a certain distance away from cities. The skill bias does not appear to favour those who held manual skilled occupations also in 1900 over other workers. The increase in manual skilled employment is also associated with increased geographical mobility.

Further work will estimate the causal relationship between industrialization and skill mix using data on geographical features, as detailed above. Moreover, for some of the individuals observed in the 1900 and 1910 censuses we have information on father's occupation, making possible an investigation into to what extent skill-biased technical change contributes to higher intergenerational mobility.

Kristin Ranestad (University of Oslo)

Education, learning and innovation: A comparison of knowledge accumulation for mining development in Chile and Norway, c.1870-1940

Much research has been done on formal basic and technical education systems and their role in industrial development and economic growth, but there is not much empirical evidence on their specific functions and direct impacts on innovation. We still know little about how knowledge is acquired and accumulated and how it is used to carry out work assignments and to innovate. This paper seeks to complement the literature with an in-depth empirical comparative study of formal and practical mining education and how this knowledge was accumulated and transformed from learning into technological innovation in Chile and Norway, two natural resource economies with important mining sectors.

The paper focuses mainly on the period from around 1870 to 1940, a period in which mining went through important technological changes and a technological gap began developing between the two sectors. High-grade ores had largely been extracted and low-grade ores remained in more remote areas and required deeper and bigger mines and the adoption of new processing techniques. Undoubtedly, mining became more complex over time. By the late nineteenth century, in global terms, operations were rationalized with new techniques and large-scale production of low-grade minerals became more common. Mining companies became increasingly dependent on scientifically trained mining engineers with long practical experience to carry out geological surveys and ore analyses and to manage complex technology. Additionally, companies required practically-oriented mining technicians with insight in how to lead operations at the mines and smelting plants.

Looking at the two mining sectors, a technological gap began to emerge in this period between them. While the Chilean mining sector was considered technologically advanced in the mid-nineteenth century, mineral and metal production stagnated by the late nineteenth century. The mining sector in Chile was huge, and ten times larger than the mining sector in Norway in terms of workers and production. In Chile, mining products stood for up to 90 per cent of exports around the turn of the twentieth century. However, although the mining sector in Chile was large, from the late nineteenth century, some repeated traits suggest an overall more negative development in Chile and a more positive development in Norway. In contrast to Chile, the mining sector in Norway was innovative and branched out a large-scale electro-metallurgical production from the late nineteenth century.

The two sectors differed in three aspects, namely (1) to the relative extent to which mineral ores were utilized; (2) the technological level of the sector and (3) to the extent to which multinationals were integrated in the host economy. Why did the two sectors develop so differently? Considering that education is argued to be in the core of industrial development,

the point of departure in this paper is that both Chile and Norway provided mining education at higher and intermediate levels with the aim of graduating scientifically and practically trained mining engineers and technicians. Moreover, scholarships were given to engineers in both countries to travel and work abroad and become familiar with foreign technology and gain practical experience. This was particularly important, because to understand all dimensions of technology, and especially how to select, transfer, adopt and modify techniques, etc., hands-on experience on-site was key. Nevertheless, despite initiatives to increase the technical capacity in Chile, the mineral and metal productions stagnated, large mineral and metal ores remained unexploited and a technological gap developed between technologically up-to-date multinational corporations using mechanized machinery, large electric power plants and new and efficient ore crushing and smelting techniques and small-scale firms using human and animal power and old inefficient working methods. To answer this question, I analyse and compare the knowledge organizations which aimed to promote knowledge for mining in detail.

The aims of the paper are to (1) further our knowledge of direct links between formal and practical learning and the use of this knowledge in innovation processes and (2) to understand more about differences which may contribute to explain variances in industrial development. The functions and outcomes of formal and practical mining education, and their influence on technological change, is explored through a comprehensive analysis of how mining engineer and mining technician graduates used the knowledge they learned in school and their practical experience at work. Similarities and differences of the formal mining instructions (the mining engineer – and technician study programmes), work experience and study travels among mining engineers and technicians and the number of graduates in the two countries are analysed. I find that the mining instructions in the two countries were surprisingly similar in character, which suggests that the mining students acquired comparable formal training. The work experience of the mining engineers and technicians also showed similar patterns, except for work experience at multinational companies. Striking differences appear when we take a closer look at the accumulation of practical knowledge with up to date technology and the number of mining engineer and technician graduates. I argue that these differences, in turn, contribute to explaining the diverging paths of the two mining sectors.

Keywords: innovation; mining education; mining; natural resource economies; Chile; Norway.

Economic History Society Annual Conference

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- A brief C.V.

For sessions:

- The title of the proposed session.
- The rationale for the session (up to 100 words).
- The titles of each paper proposed.
- A short abstract for each paper proposed (300-500 words).*
- Contact details for each speaker (name, affiliation and e-mail address; including those of co-authors).
- A brief C.V. for each proposed speaker.

* The abstract(s) should explain the background to the paper; the questions it addresses; the sources and methods it employs; and likely conclusions.

For full consideration, proposals must be received by 4 September 2017. Notices of acceptance will be sent to individual paper-givers by mid/late-November 2017 when they will be asked to provide the following:

- A revised abstract of the paper (750-1,000 words) for inclusion in the conference booklet (by 15 December 2017).
- A brief non-technical summary of the paper (if requested) for the 'Media Briefings' section of the Society's website (by 16 February 2018).
- An electronic copy of the full paper, or a web address where the paper is available for consultation (by 2 March 2018).

It is the normal expectation that speakers who submit a proposal for a paper to the conference committee should be able to obtain independent financial support for their travel and conference attendance. However, a very limited support fund exists to assist overseas speakers who are unable to obtain funding from their own institution or from another source. Details of this fund and an application form can be obtained from the Society's administrative secretary, Maureen Galbraith. The completed application form must be submitted by the September deadline as later applications for support will be considered only in exceptional circumstances.

Economic History Society Annual Conference

**6 – 8 April 2018
Keele University**

Call for New Researcher Papers

The 2018 annual conference of the Economic History Society will be hosted by Keele University, from 6 – 8 April.

The annual conference opens with papers presented by new researchers. They offer those completing (or who have recently completed) doctorates the opportunity to present their own, sole-authored, work before professional colleagues and to benefit from informed comment. Speakers who have participated in a new researcher session at a previous Economic History Society annual conference should please submit a proposal to present a paper in the Academic Session.

The session will be held on the afternoon of Friday, 6 April 2018. Those wishing to be considered for inclusion in the programme must submit an application via the Economic History Society website (www.ehs.org.uk) by 4 September 2017. This should provide:

- A short CV, which should include academic qualifications, current position and/or programme of study, conference papers, and publications
- Abstract title
- Abstract summary (max 500 words); this should include:
 - Outline of the question to be asked
 - Summary of methods and sources
 - Probable conclusions
 - Research progress
- Intended date for submission of the thesis

A supporting statement from the supervisor must be emailed separately. Please note that proposals from researchers at an early stage of their work will not normally be accepted.

Those selected for inclusion in the programme will be asked to submit a paper, 2,250-2,750 words in length, by 15 December 2017 for circulation in the conference booklet. Each new researcher will have the opportunity to speak for 20 minutes, followed by 10 minutes of discussion. Up to two prizes of £500 will be awarded for the best paper(s) presented in the new researchers' session.* The procedure for judging papers will be circulated to all participants.

The Economic History Society is able to offer a financial contribution to assist new researchers to attend the conference when this is not available from their institution. Any monies awarded would not cover travelling expenses.

Any queries should please be directed to:

Maureen Galbraith
Economic History Society
Department of Economic & Social History
University of Glasgow
Lilybank House, Bute Gardens
Glasgow G12 8RT
Scotland, UK
E-mail: ehsocsec@arts.gla.ac.uk

* New researchers, who have achieved their PhD by 31 December in the year preceding the conference, will not be eligible for the New Researcher Prize.

Economic History Society Annual Conference

6 – 8 April 2018

Keele University

Call for New Researcher Posters

The Society welcomes sole-authored posters from graduate students at an early stage of pursuing their PhD; collaborative work is not eligible. Graduate students who have presented a poster will be eligible to apply to present a paper in the New Researcher session in a subsequent year, but may present in a poster session only once during their graduate career.

The poster session will be held during tea/coffee breaks, for the duration of the conference, and will be located adjacent to the publisher exhibition. It offers students an excellent opportunity to showcase and gain feedback on early-stage work in a supportive environment. Those wishing to be considered for inclusion in the programme must submit an application, via the online system (www.ehs.org.uk), by 20 November 2017. This should provide:

- A firm title
- A short abstract (maximum 250 words)
- A current CV
- A supporting statement from the supervisor must be emailed separately.

Detailed guidance notes can be found overleaf.

Any queries should please be directed to Maureen Galbraith (ehsocsec@arts.gla.ac.uk).

Guidance Notes for New Researcher Poster Presenters

- A prize of £100 will be awarded for the best poster. Poster presenters will be responsible for providing an electronic copy of their poster in advance of the conference, together with a copy of the abstract submitted in response to the call for posters. This is to allow the panel that will judge the posters to review them in advance of the conference.
- If selected for the poster session, presenters will be responsible for bringing a printed version of their poster (A0 size, vertically-oriented, and in colour) with them to the conference. Materials for displaying the posters (i.e. poster stands) will be provided by the EHS.
- Limit the text to roughly one-fourth of the poster space, and use ‘visuals’ (graphs, photographs, schematics, maps, etc.) to tell your ‘story’.
- Text should be under 800 words. Be prepared to give a brief oral introduction to the project and answer questions.
- A banner displaying your poster title, name, and department should be positioned at top-centre of the board.
- Leave some open space in the design. An open layout is less tiring to the eye and mind.
- Make it clear to the audience how to view/read the poster. The poster generally should read from left to right, and top to bottom. Numbering the individual panels, or connecting them with arrows, is a standard ‘guidance system’.
- Simplicity is essential. Keep to the point, and don’t try to cover too many things.
- Tell the audience what question you are asking, why it is interesting, and what answer you propose.
- Think of your poster as an advertisement of your paper, not as the paper itself. Your goal is to engage people in conversation.
- Use a minimum font size of 26 pt. for the body of the text, and 46 pt. for the main title.
- Cite and reference any sources of information other than your own, just as you would do with a research paper. The ‘References Cited’ is placed at the end of the poster.
- The posters will be displayed for the duration of the conference. There will be designated times when poster presenters are asked to be with their posters; namely: tea/coffee breaks.
- Do not forget to bring along handouts that summarize your presentation; these should include your name, affiliation and email address.