

THE ECONOMIC HISTORY SOCIETY

Annual Conference

University of Exeter

30 March – 1 April 2007

Programme including

New Researchers' Papers

&

Abstracts of the other Academic Papers

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Welcome to the University of Exeter

Welcome to the University of Exeter. We recently celebrated our Golden Jubilee as a University, since our Charter was granted in 1955, although from 1922 programmes were taught at Exeter leading to degrees from the University of London. In 2005-6 the University had nearly 14,000 students, of whom some 3,500 were postgraduates. With nearly 2,900 staff, we are the largest employer in Exeter. History was taught from the earliest days and the Department of Economic History was created in 1964. Although the Department was merged with History in 1998, there is more teaching in economic and social history at Exeter than ever before.

The Streatham campus is one of the most attractive in the country and was acquired for the University in 1922. Its original nucleus was Streatham Hall (now Reed Hall), an Italianate mansion constructed in 1867 from a bequest left by a London merchant. Some 11 acres were laid out as terraced ornamental gardens surrounded by an arboretum, and additional land purchased with the result that the present estate is around 300 acres. As a registered botanic garden, it is one of the most beautiful campuses in the country with lakes, parkland and gardens. Most of the campus buildings were built in the 1960s, although the conference accommodation consists of one of the earliest buildings to be constructed, Mardon Hall, opened in 1933, and one of the most recent, Holland Hall, completed in 2004.

Exeter was one of England's most important early modern cities, but sadly much of this physical heritage has been destroyed. Three modern building phases are evident in the city: extensive postwar reconstruction, most notably in the High Street; the Guildhall Shopping Centre of the 1970s; and the current extensive redevelopment to the south of the High Street. But the city also boasts roman walls, a splendid medieval bridge, many medieval churches, a sixteenth-century quay with a magnificent Georgian customs house, and the delightful assemblage of buildings in the Cathedral Close. You will find information about the University and the City in your conference packs, together with some suggestions for excursions.

We hope you have a very pleasant stay here and find time to explore both the campus and the city in addition to what will undoubtedly be a stimulating academic conference.

Mark Overton (Local Organiser)

Maureen Galbraith (Administrative Secretary, Economic History Society)

Summary Conference Programme

(See Contents for details of each session)

Friday 30th March

0915-1045	EHS Publications Committee Meeting	PCC 1.6
1100-1400	EHS Council Meeting	PCC Hall 1.4 & 1.5
1200-1800	Registration	PCC Foyer
1400-1530	New Researchers' Session I	
I/A	<i>Human Capital</i>	PCC 1.3
I/B	<i>Land</i>	PCC 1.1
I/C	<i>Business</i>	PCC 2.4 & 2.5
I/D	<i>Overseas Expansion</i>	Newman C
1530-1600	Tea	PCC Foyer
1600-1730	New Researchers' Session II	
II/A	<i>Finance</i>	PCC 1.3
II/B	<i>Money and Banking</i>	PCC 1.1
II/C	<i>Market Efficiency</i>	PCC 2.4 & 2.5
II/D	<i>Trade</i>	Newman C
II/E	<i>Political Economy</i>	Newman D
1730-1830	Open meeting for women in economic history	PCC 2.4 & 2.5
1815-1900	Council reception for new researchers and 1st time delegates	PCC 1.4 & 1.5
1830-1900	Meeting of Conference Committee	PCC 1.6
1900-2015	Dinner	Holland Hall
2030-2130	Plenary Lecture: Professor Nicholas AM Rodger <i>War as an economic activity in eighteenth century Britain</i>	Newman A
Bar available until late		Holland Hall

Saturday 31st March

0730-0900	Breakfast	Holland Hall
0900-1045	Academic Session I	
I/A	<i>Origins of the Welfare State</i>	PCC 1.3
I/B	<i>Early Modern Textiles</i>	PCC 1.1
I/C	<i>New Share Issues and Corporate Law</i>	PCC 2.4 & 2.5
I/D	<i>Money and Microcredit</i>	Newman C
I/E	<i>Business Performance and Regulation</i>	PCC 1.4 & 1.5
1045-1115	Coffee	PCC Foyer
1115-1300	Academic Session II	
II/A	<i>Invention in Industrial Revolution</i>	PCC 1.3
II/B	<i>London Apprenticeship</i>	PCC 1.1
II/C	<i>Currency Regimes</i>	PCC 2.4 & 2.5
II/D	<i>Public Finance and Balance of Payments</i>	Newman C
II/E	<i>Control in the Dictatorships</i>	Newman D
II/F	<i>Postwar Economic Policy</i>	PCC 1.4 & 1.5
1300-1400	Lunch	Holland Hall

Conference Programme

1415-1545	Meeting of Schools and Colleges Committee	PCC 1.6
1415-1600	Academic Session III	
III/A	<i>Women in Medieval Courts</i>	PCC 1.3
III/B	<i>Eighteenth Century Risk Management</i>	PCC 1.1
III/C	<i>Consumers</i>	PCC 2.4 & 2.5
III/D	<i>Industrial Revolution in Britain and France</i>	PCC 1.4 & 1.5
III/E	<i>Fertility and Labour Supply</i>	Newman D
1600-1630	Tea	PCC Foyer
1630-1720	Plenary Session	Newman A
1730-1830	Economic History Society AGM	PCC 1.4 & 1.5
1915-1945	Conference Reception (<i>joint with SHS</i>) (<i>Hosted by University of Exeter</i>)	Great Hall
2000	Conference Dinner	Holland Hall
Bar available until late		Holland Hall
Sunday 1st April		
0730-0900	Breakfast	Holland Hall
0915-1115	Academic Session IV	
IV/A	<i>Agriculture</i>	PCC 1.3
IV/B	<i>Health and Fertility</i>	PCC 1.1
IV/C	<i>Great Depressions</i>	PCC 2.4 & 2.5
IV/D	<i>Finance, Cycles and Globalization</i>	Newman C
IV/E	<i>Business Productivity</i>	Newman D
IV/F	<i>Social Mobility in the Long Term</i>	PCC 1.4 & 1.5
1115-1145	Coffee	PCC Foyer
1145-1300	Tawney Lecture: Professor Cormac Ó Gráda <i>The Ripple that Drowns: Twentieth-century Famines as Economic History</i>	Newman A
1300-1400	Lunch	Holland Hall
1400	Conference ends	

Brief guide to conference arrangements

The conference will take place in the Peter Chalk Centre on the Streatham Campus of the University of Exeter. The conference will, once again, be co-located with that of the Social History Society, who will be located in the adjacent Queen's Building. Streatham Campus is located a short distance from Exeter town centre and is well served by local transport (further information below).

Conference accommodation on campus

Ensuite and standard accommodation will be in Holland and Mardon Halls respectively. A campus map can be found on page xiii.

All residential delegates should check in at Holland Hall, where keys will be available from 3.00 p.m. onwards. Delegates arriving before 3.00 p.m. on Friday or Saturday should first register at the Peter Chalk Centre, where luggage can be stored prior to check-in. The Porters' Lodge in Holland Hall will be open until 11.00 p.m. each evening. Delegates arriving after that time must please notify Maureen Galbraith (ehsocsec@arts.gla.ac.uk) in advance in order that arrangements for the collection of room keys can be made with 24-hour Security (Estate Patrol), based in Northcote House.

Registration

Registration will take place between 12.00 and 18.00 in the Foyer of the Peter Chalk Centre. The registration desk will be staffed 9.00 a.m. – 6.00 p.m. Friday-Saturday inclusive and 9.00 a.m. – 2.00 p.m. on Sunday.

Alternative Accommodation

Accommodation off-campus can be found on the Exeter City Council website:
www.exeter.gov.uk/index.aspx?articleid=544

Car parking

Those staying in Mardon Hall and Holland Hall may park in the Holland Hall car park without charge provided they obtain a car-parking permit when they register in the hall. Those not staying in these halls may park on the campus but must purchase a pay and display ticket.

Book displays

Publishers' and booksellers' displays will be in the Foyer of the Peter Chalk Centre.

Meals and Morning Tea/Afternoon Coffee

Breakfast will be served in Holland Hall, as will all lunches and dinners. Coffee and tea will be available in the Peter Chalk Centre.

Receptions and Bar

The Council Reception for new researchers and first-time conference delegates (Friday, 1815-1900 hours) will take place in the Peter Chalk Centre. The Saturday evening Conference Reception (Saturday, 1915-1945), to which all are invited, will be held in the Great Hall. A late bar will be provided on both evenings in Holland Hall.

Meeting rooms for New Researchers, Academic Sessions etc

The Conference will be using a large number of rooms, given the size of the academic programme; they will all be located in the Peter Chalk Centre.

Guide to conference arrangements

Internet Access

An internet café will be available in the Peter Chalk Centre (room 2.3). Delegates need only type in their name and the conference title to access a PC.

Dial up internet access is available in delegate bedrooms via the telephone line. Phone cards can be purchased from the Porters' Lodge to access the telephone line. Each bedroom will contain instructions giving information on how to set up the internet access.

Note: – we have been advised by the Exeter Conference Office that the internet café is the preferred option for internet access as the dial up access in bedrooms is sometimes difficult to use.

Useful Telephone Numbers

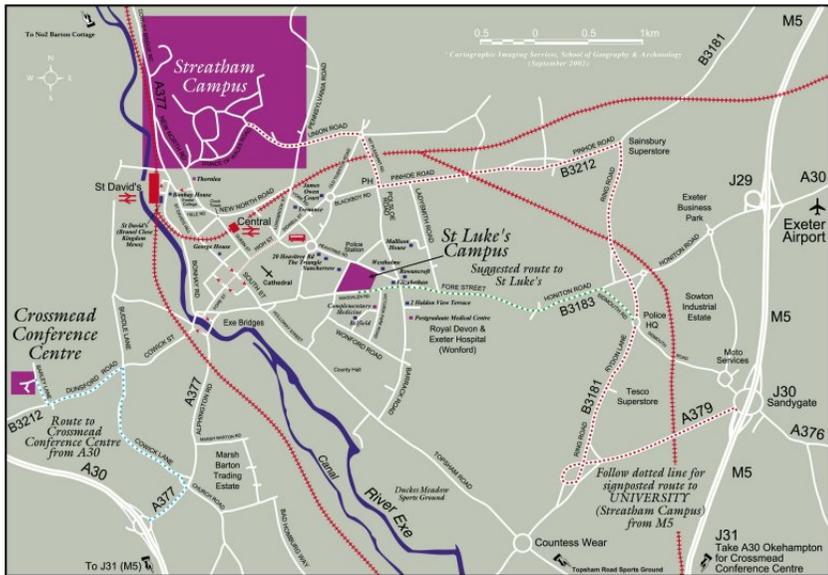
Peter Chalk Centre: 01392 263515

Holland Hall: 01392 262349

Mardon Hall: 01392 263762

Security: 01392 263999 (Estate Patrol)

How to reach Streatham Campus (University of Exeter)



A copy of this map can be found at: www.exeter.ac.uk/univ/citymap.jpg

Exeter is served by the M5, is just over two hours from London by train, and has an airport serving many UK cities.

By Road

www.exeter.ac.uk/about/directions.shtml#directions

Halls of residence are signposted (with yellow AA signs) from Prince of Wales Road. Please note that vehicular access to Holland Hall is via Clydesdale Road.

From the East (via M5)

Leave the M5 at junction 30. Take the third exit (A379) and follow the signposted route to the University.

From the West (Via A30)

Leave the A30 at the Dawlish and Marsh Barton turning. Turn left at the large roundabout into Alphington Spur, which becomes Alphington Road. You will pass through several sets of traffic lights, pass under a railway bridge, over more traffic lights and then up to a very large roundabout. Leave at the third exit (Bonhay Road). Follow this until just past Exeter St. David's station, where you come to a small roundabout. Turn sharp right into St. David's Hill. Take the second left into Hele Road. At the end of this, turn left again into New North Road. Take the second right into Streatham Drive, fork right into Prince of Wales Road. Follow this along until it drops into a dip with a right hand bend at the bottom. Turn left at the bottom of the dip into Stocker Road.

By Rail

www.exeter.ac.uk/about/directions.shtml#directions

How to reach Streatham Campus

Exeter has two railway stations – Exeter St. David’s (main station) and Central. Exeter St. David’s Station is approximately 10 minutes walk from the Streatham Campus via a signposted route. The walk is uphill but taxis are available. Journey times from London Paddington to Exeter St David’s average 2 hours 30 minutes. Trains from Waterloo go to Exeter St David’s via Exeter Central. They take on average 3 hours 30 minutes but can be much cheaper.

Destination:	Journey Time:
London Paddington	2 hours 30 minutes
Bath	1 hour 20 minutes
Birmingham	2 hours 40 minutes
Bristol	1 hour 20 minutes
Cardiff	2 hours 30 minutes
Manchester	4 hours 40 minutes
Oxford	2 hours 30 minutes
Southampton	2 hours 30 minutes

National Rail Enquiries: Tel: 08457 48 49 50 Website: www.nationalrail.co.uk/

By Bus

National Express coaches operate a service to Exeter, from most other areas of the country. Further information is available. Tel: 08705 808080 Website: www.nationalexpress.com/home/hp.cfm

Bus service D runs from the High Street to the University at 05 and 35 minutes past each hour on Fridays and Saturdays. Alight at the Peter Chalk Centre.

By Taxi

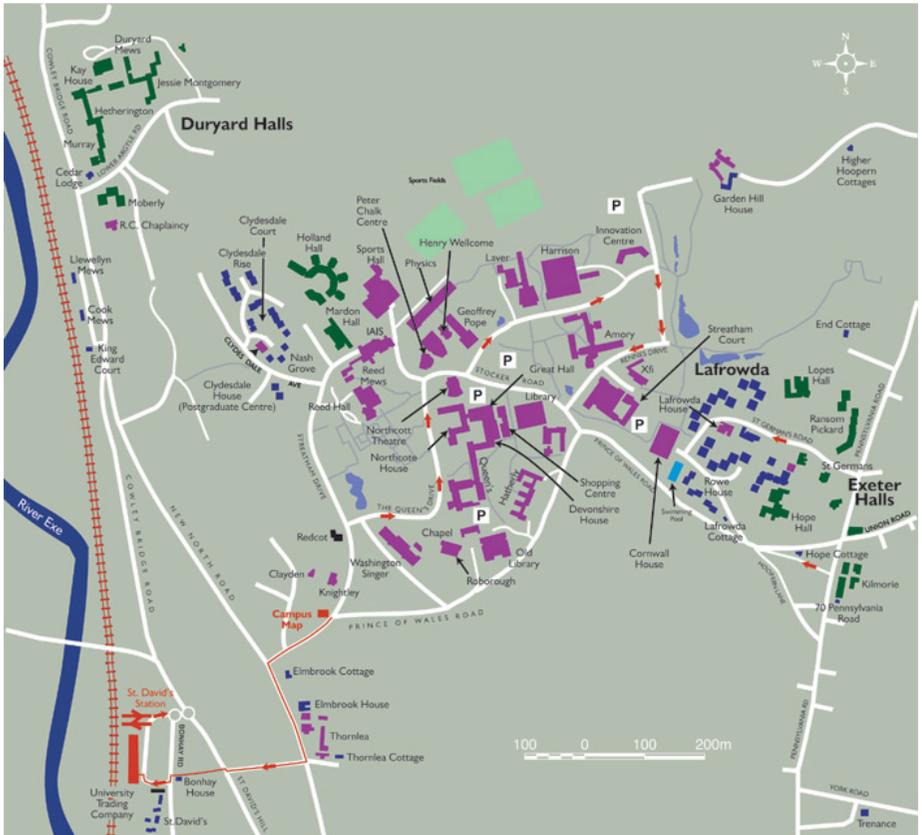
The Streatham Campus is located close to the city centre. Taxis are available from Exeter St David’s. The nearest taxi rank to the bus station is in Sidwell Street. A taxi from the railway station will cost approximately £6.

By Air

www.exeter-airport.co.uk

Direct flights operate into Exeter from a large number of national and international airports, including: Aberdeen, Belfast, Dublin, Edinburgh, Glasgow, Leeds, Manchester, Newcastle, Norwich, Alicante, Amsterdam, Brest-Brittany, Guernsey, Jersey, Malaga and Paris. There is a bus to Exeter St David’s Station (see above) or a taxi direct to the University. A taxi will cost approximately £17.

Campus Plan – Streatham



A copy of this map can be found at: www.exeter.ac.uk/about/campus.shtml#streatham

NEW RESEARCHER PAPERS

An historical analysis of the change in compulsory schooling laws in Europe after the Second World War

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(m.g.viarengo@lse.ac.uk)
Supervisor: Dr Peter Howlett

1. Introduction

The expansion of compulsory schooling after the Second World War represented a very important policy change: a reform that can be considered among the first structural adjustments common to the majority of European countries. The increase in school-leaving age laid the basis for further educational expansion.

Specifically, over the period 1950-2000, 15 Western European countries extended the school-leaving age by one year or longer; mainly during the 25 years after the war. What is interesting is that the change in legislation was undertaken by countries with different traditions and experiences in educational policy such as Nordic, Anglo-Saxon and Continental countries. In fact, European countries were different and the war had a dissimilar impact on their economies. However, new equilibria at both national and international level led countries to undertake this policy change in education.

Many theories have been proposed in the sociology and political science literature to explain the expansion of education during this 'period of extensive development of the educational and training system'.¹ However, these important contributions have not explained the timing of the changes in school-leaving age laws. In the existing literature there are two kinds of analyses related to the expansion of education. On one hand, there are macroeconomic studies; these suffer from the limitation of not considering the role of institutions, thus lacking an historical contextualization of the policy changes. On the other hand, the country-level studies are too specific to allow any inference about how common factors may have influenced the way in which countries have shaped their education policy. Consequently, this topic has not been adequately studied so far.

What is missing in the existing literature is a comparative analysis of the education policies undertaken at European level. Comparative work by Diebolt & Fontevielle (2001) and Ringer (1979) represents a good start but is not sufficient to understand what were the factors, beyond the national boundaries, driving the expansion of compulsory schooling.

The question addressed here is: what were the driving forces behind the rise in compulsory schooling that took place in Europe after the Second World War? This is to say, how is it possible to explain the timing of the changes in school-leaving age laws that occurred in most European countries after the war? Why did some countries increase compulsory schooling before others?

I aim to contribute to the existing literature in two ways. First, I will adopt a comparative approach by undertaking a quantitative analysis using a new dataset constructed for a panel of 15 European countries over the period 1950-2000. The second intended contribution is methodological: I introduce the technique of duration analysis that has been recently used in political economy to study the determinants of specific policy changes.

The paper proceeds as follows. First, I review the origins and the main features of the compulsory schooling laws that characterized the European experience after the war. Then, I will analyse the main theories that scholars have proposed to explain the expansion of education and I will derive from these the hypotheses that I will test empirically. After, I will briefly describe the dataset I have constructed and I will explain the methodology for the quantitative analysis. Finally, I will provide comments on the results and concluding remarks.

¹ Diebolt (1999), p.30.

2. Historical background

Following the definition provided by the OECD, compulsory schooling is 'the span of years during which every normal child must be receiving a formal education'.² Compulsory schooling was introduced in most Western countries between the second half of the nineteenth century and the beginning of the twentieth century.³

Economic historians have been interested in the topic of formal education in order to understand how institutions can create the conditions to promote economic development and growth.⁴ Landes' (1969) work has shown that cultural, social and educational factors were essential in determining the development of more advanced technologies. Therefore, one may wonder how important was education in the process of industrialization. Interestingly, compulsory schooling was introduced at a later stage of the industrialization process whereas basic human capital, measured in terms of literacy rates, was widespread even before the introduction of compulsory schooling as Cipolla (1969) has illustrated. Why was compulsory schooling not institutionalized before the nineteenth century and only after the beginning of the industrialization process in most European countries?

Mitch (1983) argued in his doctoral dissertation that an earlier introduction of compulsory schooling would have been socially desirable but not economically necessary as there was a lack of demand for educated workers. After 1840, the shift in demand was probably generated by the greater complexity of the productive activity and by the need of having a disciplined, responsible and industrious working class as Bourdieu & Passeron (1977) have claimed.

After this major economic and social change that created the common impetus for reform in Western Europe, education expanded by following national patterns and there was no other institutional response that was undertaken in the same epoch by European countries. Moreover, the economic depression that followed the Great War and the slow recovery during the interwar period imposed important constraints on Governmental expenditure for social services such as public education.

After 1945, with the end of the war things changed dramatically. Countries started experiencing unprecedented growth rates and the recovery was faster than what the more optimistic could have expected (Eichengreen [1996]). Moreover, the new economic and socio-political conditions created the pressure for governments to modernize the schooling system. The expansion of compulsory schooling was one of the policy changes that took place in the majority of European countries after the war. It was probably not a policy change as revolutionary as the introduction of compulsory schooling towards the end of the nineteenth century, however it was of great importance. In fact, what happened was an institutional reconfiguration of the schooling system that was undertaken in countries that were very different from each other, with dissimilar economic conditions and different cultural and educational traditions.

3. Theoretical framework

Many theories have been proposed by sociologists and political scientists in order to explain the development and the expansion of the schooling institution. However, it is important to acknowledge the fact that there are country-specific determinants of the school-leaving age laws that cannot be observed by doing a cross-section analysis over time⁵ and that certainly have played an important role in leading to the passage of laws. On the other hand, it is also important to notice that the interest of the analysis relies on trying to explain what are the factors that have caused the concentration of the change in compulsory schooling in the postwar period by formulating hypotheses derived from the literatures that have covered this topic. In the following

² OECD (1983), p.12.

³ Maynes (1985), p.25.

⁴ See Cipolla (1969) and Tortella (1990).

⁵ In order to address this issue, later in the panel regression analysis, fixed effects will be used to take into account country-specific attributes.

paragraphs I will analyse the main theories I have extracted from different literatures and during the presentation I will formulate the hypotheses I will use for the empirical analysis.

3.1 Technical-functional theory (modernization)

Among the theories introduced in the literature, particularly important appears to be the 'technical-functional theory'. According to this framework, the process of modernization that occurs in society creates the demand for a more educated labour force. In particular, technological advances and the greater complexity of the organization of production make a skill upgrading necessary. According to Collins (1971), this happens when the proportion of jobs requiring more educated workers is perceived to increase and more education is required to perform tasks that previously required less education. As an institutional response to this, states can intervene through education policy. That is, governments can increase the number of years of compulsory schooling in order to endow citizens with the skills necessary to enter into a more complex labour market. This framework is different with respect to the human capital theory as the policy change that is undertaken to increase the skills of the labour force is considered as the institutional response to the economic development and not only as the private response to monetary incentives as Craig (1981) recognizes.

3.2 Neo-institutionalism (political economy factors)

This theory has been developed in order to address the unanswered questions left by the technical-functional theory. In particular, what has been observed is that the expansion of education at all levels is something that goes beyond the experience of rich and developed countries. Therefore, in order to understand what are the driving forces behind this world-wide educational experience, sociologists have analysed global phenomena that may have affected the development of similar institutions across different countries. This is the reason why Meyer & Schofer (2005) in their analysis related to the global expansion of higher education have focused on 'how much the institutions of modernity (as opposed to the actual income and resource levels nominally associated with these modern institutions) diffuse around the world independent of socioeconomic developments'.⁶ In the context of the European expansion of compulsory schooling it is possible to notice that countries at different stages of development, with dissimilar levels of GDP per capita and technology have enacted the school-leaving age laws to increase compulsory education. Therefore, it seems necessary to investigate whether political economy factors may provide a good explanation to understand this change in education policy.

3.3 Role of the state

This is a different theory with respect to the ones that have been previously introduced in the sense that it provides a supply-side explanation. That is to say that the timing of the enactment of the school-leaving age laws is considered not to be a result of the economic and socio-political conditions of the postwar society but as a direct consequence of the capability of the state to support the expansion of education. According to this theory the expansion of education is affected by the strength of the state. Consequently, strong states that emerged at the end of the Second World War had the possibility to devote resources to education and to expand the level of compulsory schooling with the belief that 'sustained economic growth needed an increasingly skilled manpower'.⁷ This framework is also in contrast to the class-conflict theories as it recognizes that as the State becomes more complex and structurally organized, then the possibility for class-conflict is greatly reduced whereas the 'scope for negotiation increases enormously',⁸ as

⁶ Meyer & Schofer (2005), p.5.

⁷ Demeulemeester & Diebolt (2005), p.3.

⁸ Archer (1979), p.237.

Archer (1979) suggests. In this general framework, a stream of the literature has focused on the strength of the state in promoting change in the educational system.⁹

4. Data and methodology

4.1 Data sources

A novel dataset has been constructed by drawing from a variety of national and international sources. It covers the period 1950-2000 and it consists of annual data. The dataset includes 15 European countries: Austria, Belgium, Denmark, Finland, France, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

4.2 Descriptive statistics

The evolution of average years of schooling, GDP and technology per capita as well as other indicators of human capital and variables that will be used in the regression analysis have been examined for the 15 European countries.

4.3 Regression analysis

The model

The analysis has been carried out by using the panel data technique and the model used is a duration model. The reason why I have used this model is because it solves many of the shortcomings of the traditional models in explaining the timing of a policy change.¹⁰ The main assumptions are: the model is semi-parametric and the time-fixed and time-varying covariates are exogenous. Therefore, the following propositions have to hold true:

$$V s \geq t, E(Z_{i,s} | h_{i,t}) = 0$$

$$V s \geq t, E(X_{i,s} | h_{i,t}) = 0$$

This is the specification of the hazard function of the Cox proportional hazard model:

$$h_{i,t} = h_{0,t} e^{[X_i \alpha + Z_{i,t} \beta]}$$

where:

$h_{i,t}$ is the duration variable

$h_{0,t}$ is the baseline hazard function that is left unspecified

X_i is the vector of the time fixed covariates

$Z_{i,t}$ is the vector of the time-varying covariates

α, β are the coefficients to be estimated

The dependent variable is the duration variable that reflects the timing of the passage of the law. Among the covariates there are constant variables and time-varying variables. The linearity assumption of the effects could be relaxed as the theories do not imply linearity.

Empirical analysis

I have used the model described above to test the theories that have been presented in section 3 with the purpose of understanding which one provides the best explanation for the expansion of compulsory schooling in postwar Europe. I have run the regressions by using a number of specifications: the 15 countries over the period 1950-2000. After, I have divided the time period in two according to the end of the Golden Age. Namely, I have run a regression that covers the period 1950-73 and another from 1974 until 2000. Finally, I have divided the sample of countries in two according to the level of backwardness with respect to human capital. In this regard, it is

⁹ Archer (1979) and Thelen (2004).

¹⁰ Jenkins (2005) provides an exhaustive analysis of the limitations of the traditional models.

possible to observe a distinctive pattern that characterizes Southern European countries with respect to the other countries in the sample.

Following the recent techniques developed in the political science and political economy literatures, the possible ‘effect of contagion’ in the passage of the compulsory schooling legislation has been tested by using a variety of specifications.

Finally a test to check the robustness of the empirical estimation has been carried out.

5. Concluding remarks

The empirical evidence I have found will be presented at the conference and is in support of the theory of modernization when the overall period is considered. However, during the Golden Age, the unprecedented growth experienced by most European countries had a strong impact on the passage of the school-leaving age laws. The technical-functional theory performs better again after 1973. This is when the technological gap was perceived by European governments as particularly important and the globalization process greatly enhanced the need to modernize the educational system. On the other hand, the more advanced nations among the 15 European countries considered, soon shifted the focus of their policies to higher education. This is because they had already reached high participation rates in secondary education and the progressive ‘scientization’ of technology required a more educated labour force by creating greater complementarities between highly educated workers and the new equipment. Therefore, the empirical findings are in support of the theory put forward by Aghion, Meghir & Vandebussche (2004) and the idea that the ‘appropriate institutions’ vary according to the level of development of a country. Moreover, the results of the robustness analysis show that it is possible to reject the hypothesis of endogeneity.

The importance of national factors, of ‘contagion’ as well as of the process of European integration in determining the expansion of formal education has been acknowledged and it appears to be a promising area for future research.

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Lucas versus Romer: human capital and economic growth in Asia 1890–2000

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1. Introduction

Few people would argue that human capital is unimportant for economic growth. However, in studies focusing on this relationship, so far the results have more often than not been disappointing. As Judson (2000, p.210) states, '[d]espite the conventional wisdom that output growth and human capital should be positively correlated, statistically significant results have been mixed, and strong and positive correlations between growth and human capital accumulation have been the exception rather than the rule'.

This paper addresses two possible reasons for this development. First, proxies of human capital may not fully capture the human capital as defined in the new growth theories. Second, there is no reason to assume that one growth theory is applicable and others are not. This may be different over time and among countries. These issues are addressed while focusing on three Asian countries, a successful (Japan) and two less successful economic developers (India and Indonesia). We start in the next section with a brief description of human capital data. In section 3 we examine different growth theories and their country-specific applications. We end in section 4 with a brief conclusion.

2. Data

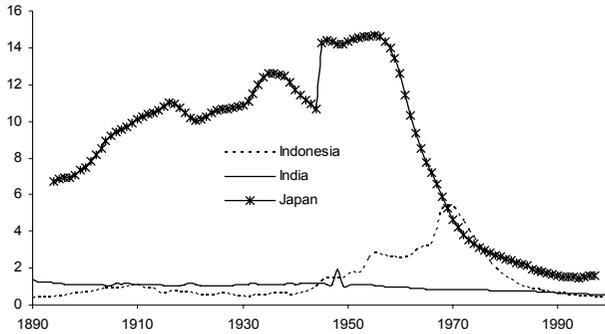
Depending on the availability of data, the range of possible proxies for human capital is very wide. Currently, a much-used proxy is *average years of schooling* in the population (Nehru et al. 1995; Barro & Lee 1993, 2001). Yet, there are two problems with this proxy. First, it excludes the quality of education. As this is likely to increase both from primary to higher education and over time, omitting the quality may decrease human capital accumulation and thus bias the results towards rejecting constant marginal returns (see equation 3). Second, it may also be used as an indicator of the time spent on human capital accumulation. If true, this means that the level of *average years of schooling* is an indication of Lucasian growth (see section 3.5).

Therefore, we need an alternative. Following Judson (2002) we use expenditure on education to capture the quality of education. We include all expenditure on education (private, public, and foregone wages) plus experience in the population between ages 16 and 65 (working population) in year t . Experience is set equal to the sum of all gains from experience estimated in a Mincer-equation from age 16 to j . This can be done only for years with household surveys, which were done in the 1980s and 1990s. Therefore, we estimate earlier years by using a Perpetual Inventory Method (PIM), subtracting the yearly addition to the stock of human capital from private, public and foregone wages and adding depreciation.¹¹

The general patterns in the data are summarized in figures 1 and 2. Figure 1 gives the human capital to physical capital ratio and figure 2 gives the human capital to output ratio. The human to physical capital ratio is more or less constant in India and Indonesia.

¹¹ For an extensive description of the construction of the human capital variable see Van Leeuwen (forthcoming).

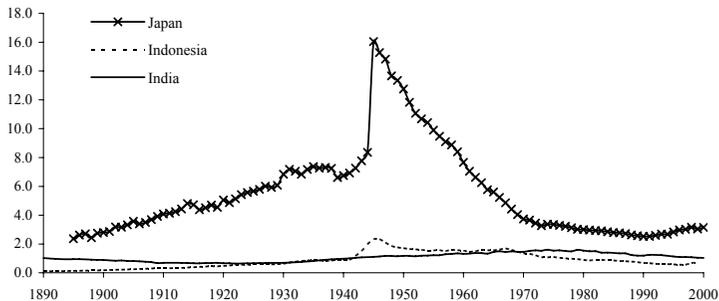
Figure 1: *Human capital gross fixed non-residential physical capital stock ratio (based on constant 1990 international USD, converted at PPP)*



Source: Van Leeuwen (forthcoming).

In Japan it increases slightly up to 1950 and decreases afterwards. The increase in the ratio in Indonesia around 1970 was caused by a decline in physical capital investments, which was independent of GDP. This can be seen in figure 2, where there is even a decline in the human capital:output ratio. Equally, the peak in the human capital:output ratio in Japan was caused by a fall in GDP caused by World War II. The human capital:output ratio shows about the same pattern. This suggests that the growth rates of per capita GDP and physical and human capital are more or less in correspondence. The exception is Japan in the second half of the century, when the growth of human capital was considerably lower. This growth pattern of human capital corresponds with that of Romerian growth (see equation 8) while in the other countries and periods the growth of per capita human capital corresponds with Lucasian growth (see equation 4).

Figure 2: *Human capital:output ratio (based on constant 1990 international USD, converted at PPP)*



Source: Van Leeuwen (forthcoming).

3. Lucasian versus Romerian growth

3.1 Introduction

In this section we start with an overview of two main branches of the new growth theories. Then we turn to two formal tests of the difference between Lucasian and Romerian growth. In section 3.3 we discuss the assumption of constant marginal returns and section 3.4 addresses the effects of the level and growth of human capital. Section 3.5 then turns to the issue mentioned above that *average years of schooling* may be an unfortunate proxy for human capital if one wants to test for Romerian growth.

3.2 New growth theories

Broadly, these theories can be divided into two branches. In the first branch, pioneered by Lucas (1988), human capital is seen as a factor of production. This model has two sectors. In the first sector, human and physical capital are used to produce output, leading to the following production function:

$$Y = AK^\alpha (uhL)^{1-\alpha} h_a^\gamma \quad (1)$$

where A is the level of technology, K is physical capital, u is the time devoted to productive activities, h is per capita human capital, L is the size of the labour force, and h_a^γ is the average per capita level of human capital (in case of the representative agent $h_a=h$).

In the second sector, the share of human capital that is not utilized in the productive sector is used to produce extra human capital. Only if this exhibits non-diminishing returns is there endogenous growth. This can be written as:

$$\dot{h}_t = h_t B(1-u_t) - \delta h_t \quad (2)$$

where δ is the depreciation of human capital, (h) , and $B(1-u_t)$ indicates the increase in the amount of human capital. In other words, B is a technical parameter determining at what rate investments in the second sector are converted to the growth of human capital, and $(1-u_t)$ is the share of human capital that is devoted to human capital formation. Equation (2) has constant marginal returns because the growth of human capital is independent of its level; i.e., an increase in human capital for a more highly educated person requires the same effort as for someone at primary school. Consequently, the growth of human capital can be written independent of its level:

$$g_h = \dot{h}_t/h_t = B(1-u_t) - \delta \quad (3)$$

From equations (1) and (3) we can obtain the balanced path growth rate of GDP:

$$\frac{\dot{y}}{y} = \frac{1-\alpha+\gamma}{1-\alpha} B(1-u) = \frac{1-\alpha+\gamma}{1-\alpha} \cdot \frac{\dot{h}}{h} \quad (4)$$

The second branch of new growth theories was pioneered by Romer (1990). This model has three sectors: a technology producing sector, an intermediate goods producing sector where capital goods are produced, and a final output producing sector. The part of human capital that is not used directly in the sector producing final output is used to create new technologies. Therefore, the level of human capital, H , has a positive effect on the growth of technology, A :

$$\dot{A} = \sigma H_A A \quad (5)$$

Here A is the level of a technology index, H_A is the amount of human capital devoted to the accumulation of technology (\dot{A}), and σ is a productivity parameter.

In the second sector, each new A creates a new intermediate product, x , which in turn determines capital, K . Hence, K depends on the number of intermediate products, $t=1 \dots A$, and the price of a unit of x expressed in consumption, η :

$$K = \eta \sum_{i=1}^A x_i \quad (6)$$

The function for the third, final output, sector thus becomes:

$$Y = H_Y^\alpha L^\beta K^{1-\alpha-\beta} \quad (7)$$

Here, H_Y is an exogenous variable indicating the amount of human capital not used in the technology-producing first sector. In other words, it is the amount of knowledge used to apply technologies to the production process.

In this model, endogenous growth stems from the positive effect of research on innovations, whereas more innovations increase productivity of researchers in the future. In other words, if we see equation 5 in terms of the Lucasian second sector (without depreciation) we can argue that the source of endogenous growth is the existence of constant marginal returns to technology accumulation. Consequently, on a balanced growth path, the level of human capital increases output growth, i.e.:

$$g = \dot{Y}/Y = \dot{K}/K = \dot{A}/A = \sigma H_A \quad (8)$$

3.3 Marginal returns

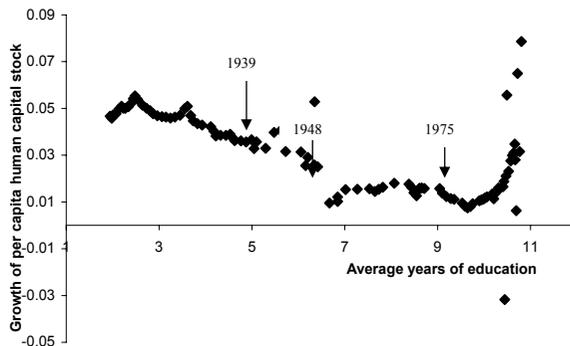
A first way to formally distinguish Lucasian and Romerian growth is to test for the presence of constant or increasing marginal returns to human capital accumulation. We use equation 3, which we put in a scatterplot under the assumption that B is constant. When there is a flat line or increasing trend this means that there are constant or increasing marginal returns.

Figure 3 shows that in Japan there is an almost constant relation until around 5.6 years of education and a fast declining trend between 5.6 and 6.7 years of education in the population. As we move forward in time, the *average years of education* also rises. So, this figure displays a development where 5.6 years of education corresponds to circa 1939 and 6.7 years to 1948. After 1975 there is a clear upward trend.

Comparable patterns can be found in figures 4 and 5 for Indonesia and India. Hence, all three countries show periods of decreasing, constant, and rising trends and, therefore, also increasing, decreasing, and constant marginal returns to human capital accumulation.

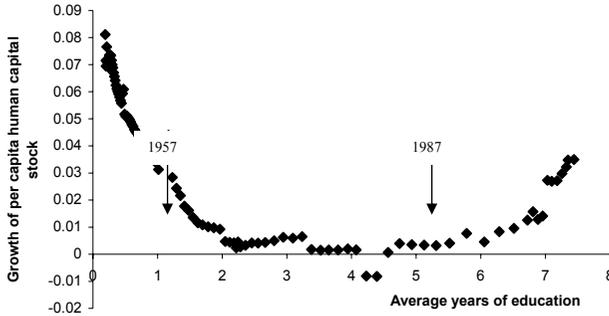
This suggests, just as we saw in section 2, that in Japan in 1890-1940 Lucasian growth dominated, while this is rejected for the second half of the century. In India and Indonesia there is in turn Lucasian and Romerian growth. However, two points have to be stressed. First, in the twentieth century the time spent on human capital accumulation, $(1-u)$, grew steadily. This may lead to increased growth rates. Hence, one may argue that, even with diminishing marginal returns, there is Lucasian growth, although it does not last forever and declines to zero over time. Second, we assumed the efficiency of human capital accumulation, B , to be constant. However, this is not completely clear. In India and Indonesia in the mid-twentieth century the decrease in growth of *average years of education* was combined with an increase in spending per student. Hence, it is likely that for these countries B declined, which may cause constant marginal returns to be falsely rejected.

Figure 3: Relation between average duration of training and growth rate of the per capita human capital stock in Japan



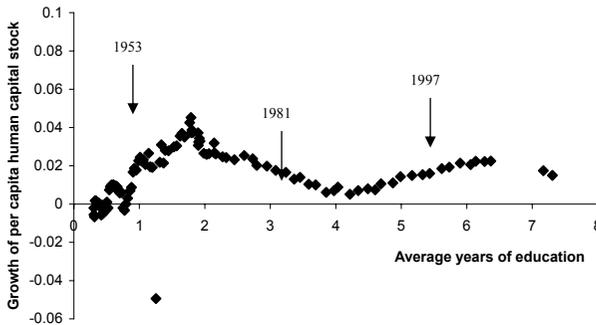
Source: Van Leeuwen (forthcoming).

Figure 4: Relation between average duration of training and growth rate of the per capita human capital stock in Indonesia



Source: Van Leeuwen (forthcoming).

Figure 5: Relation between average duration of training and growth rate of the per capita human capital stock in India



Source: Van Leeuwen (forthcoming).

3.4 Regression

A second way to explore the difference between Lucasian and Romerian growth is to look at the effect of the level and growth of human capital. We start with:

$$\Delta \ln y_t = \alpha + kt + \beta_1 \Delta \ln y_{t-1} + \beta_2 \ln y_{t-1} + \beta_3 \ln h_{t-1} + \beta_4 \Delta \ln h_{t-1} + \varepsilon_t \quad (9)$$

where y is per capita GDP, h is an indicator for the per capita stock of human capital in year t , t is the trend, and ε is the error term. We use one time lag to avoid simultaneity.

The results are reported in table 1. It is worth noticing that, just as is commonly argued in the literature, we found the coefficient of *average years of education* to be positive and significant, but small, between 1.5 per cent and 4 per cent. However, in the regressions with our newly estimated human capital stock, we found, except for Japan, a positive effect of the growth of human capital on per capita GDP growth (for Indonesia this effect was even significant at 10 per cent) while the effect of the level was negative and insignificant for India and Indonesia. For Japan, although not significant at the 10 per cent level, the t-value of the level of human capital still exceeded one, which, as a rule of thumb, means that this variable is important for explaining economic growth.

Although we have to be cautious with these results, they do seem to confirm our findings from section 2. If we use the newly estimated stock of human capital, the growth of human capital affects economic growth positively, indicating Lucasian growth. In Japan the positive effect stems from the level of human capital, indicating that the second half of the twentieth century must be dominated by Romerian growth.

Table 1: *Regression results using average years of education and the alternative stock of human capital**

Dependent variable: $\Delta \ln y_t$						
<i>h</i> = newly estimated human capital stock						
	India		Indonesia		Japan	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Constant	-0.348	-2.40	0.413	2.84	0.015	0.045
Trend	-0.001	-1.98	0.002	3.58	0.001	0.043
$\Delta \ln y_{t-1}$	-0.049	-0.570	0.443	6.40	0.012	0.276
$\ln y_{t-1}$	-0.015	-0.831	-0.070	-3.48	-0.043	-2.32
$\Delta \ln h_{t-1}$	0.015	0.084	1.096	2.85	-0.423	-1.69
$\ln h_{t-1}$	-0.047	-0.015	-0.008	-0.798	0.036	1.30
R^2	0.408		0.711		0.849	
Obs.	109		110		106	
AR1-1 (prob)	0.712		0.199		0.280	
Normality(prob)	0.549		0.070		0.381	
<i>h</i> = average years of education **						
Constant	0.292	1.99	0.431	2.88	0.362	5.51
Trend	-0.0001	-0.571	0.00002	0.055	-0.002	-2.16
$\Delta \ln y_{t-1}$	-0.074	-0.855	0.394	5.67	0.018	0.454
$\ln y_{t-1}$	-0.047	-1.92	-0.064	-2.85	-0.058	-5.80
$\Delta \ln h_{t-1}$	-0.040	-1.29	0.006	0.065	-0.027	-0.689
$\ln h_{t-1}$	0.020	3.95	0.015	2.31	0.039	4.85
R^2	0.364		0.703		0.876	
Obs.	109		107		110	
AR1-1 (prob)	0.172		0.271		0.961	
Normality(prob)	0.997		0.154		0.050	

*Dummies not reported

***average years of education* is inserted in the equation without logarithm.

3.5 Combining ‘average years of education’ and marginal returns

It is interesting to note from table 1 that, when using *average years of schooling* as the human capital proxy, suddenly the coefficient of the level of human capital becomes positive for all three countries. Limiting ourselves to the theory of Lucas (1988), this means that if the growth of human capital determines economic growth while it is the level of *average years of schooling* that affects economic growth, the level of *average years of schooling* must determine the growth of the newly estimated stock of human capital (see Földvári & Van Leeuwen 2006). This we can see starting with:

$$\frac{\dot{y}}{y} = \alpha + \beta \frac{\dot{h}}{h} \tag{10}$$

where the growth of per capita GDP depends on the growth of the per capita estimated human capital stock. This is roughly the equation describing the long-run growth in the model of Lucas (1988). However, if we look at the level of *average years of schooling*, we get:

$$\frac{\dot{y}}{y} = \gamma + \phi educ \quad (11)$$

where *educ*, the level of *average years of schooling*, determines the growth of per capita income. This is the regression following from the theory of Romer (1990). However, combining equation (10) and (11) leads to:

$$\gamma + \phi educ = \alpha + \beta \frac{\dot{h}}{h} \quad (12)$$

Rewriting:

$$\frac{\dot{h}}{h} = \frac{\alpha - \gamma}{\beta} + \frac{\phi}{\beta} educ \quad (13)$$

Therefore, the growth of human capital depends on the level of *average years of schooling*. This corresponds with equation (3) in the Lucas (1988) theory. Therefore, one may (exaggerating somewhat) argue that studies that find evidence in favour of Romer's theory, from regressions based on the level of *average years of schooling*, basically confirm Lucas' theory.

4. Conclusion

This paper addresses three issues that may bias the choice between the different growth theories. First, the human capital variable must include quality of education. Second, the efficiency of human capital accumulation may change over time, which may lead to falsely rejecting Lucasian growth. Third, *average years of schooling* can be viewed as an input to human capital accumulation. Hence, inserting the level of *average years of schooling* in a growth equation may suggest Lucasian growth.

Based on these observations, the main conclusion from this paper is that India and Indonesia in the entire century, and Japan in the first half of the century, were dominated by Lucasian growth. However, Japan in the second half of the century is dominated by Romerian growth.

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Are we being served? Personalized public service in the Dutch Republic

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1. Introduction

Over the last decade there has been a shift in payment mechanisms for public employees. Mechanisms that relate performance to pay have become more and more common in several European countries (OECD, 2005). Although not included in the report of the OECD, the same is the case for the Netherlands. The most striking example is the case of a Dutch police commissioner who has a personalized performance contract. The overall performance of 'his' force has personal consequences for the commissioner; either a bonus, or dismissal.

Bureaucratic structures once were the solution for problems of nepotism and profit-seeking officials. Central in this development is the conceptual dichotomy of *personalization* and *depersonalization*, that is the idea of linking official public functions, *Ambten*, to individuals for instance by means of property rights or flexible payment. The latter type of personalization is at stake in recent developments of linking pay to performance. Such performance contracts flow from the New Public Management (NPM) movement. This approach aims to awake the 'entrepreneurial spirit' of civil servants and public managers (Hood, 1991; Farnham et al., 1996; Hood, 1998; Pollit & Bouckaert, 2000; Hood & Peters, 2004; Noordegraaf, 2004). NPM can be seen as a reaction to the inflexible and inefficient experiences with bureaucratic structures.

The organizational model of the bureaucracy, elaborated by Weber (for example, 1991), emphasizes control, efficiency and rationality. With these built-in mechanisms the organizational model prevents flexible, individual and particularistic execution of functions. Standardization and depersonalization are the key concepts of this model, which can be seen as a perfect example of modernization (Van Hoof & Ruysveldt, 1996; Van der Loo & Van Reijen, 1997). After all, rationalization, commodification and social structures are central to modernity. All these characteristics are present in the bureaucratic organization with its fixed salaries (commodification), standardized procedures (rationalization) and institutionalization of structures and hierarchy (social structure). This model has been of great importance for the development of the public sector. Many of its characteristics can be found in the organization of governmental tasks. However, examples show that the bureaucratic approach can be very inefficient and ineffective, because of its emphasis on procedures instead of goals. NPM therefore introduced the entrepreneurial public official. Privatization, contractualization and performance related pay are, as stated, some of the solutions proposed by the NPM approach.

Personalization can also be seen in this light. However in pre-Weberian times, that is in the early modern era, Dutch public functions also had a personal, individual character. This paper therefore investigates the effects of personalized public functions in the Lower Countries on the functioning of public service. It will focus on the function of *schout*, an office at the local level which is responsible for public safety and a predecessor of the police commissioner we mentioned above.

The aim of this paper is twofold. First of all to understand the effects of personalized public functions. Secondly, it wants to categorize the effects. In other words: in what terms can we describe and understand the effects of personalized public functions? We answer this question by introducing three types of personalization. These types then are used to understand the daily practice of the *schout* in terms of effects of personalization. We conclude this paper by linking three kinds of problems to the three types of personalization.

2. Personalization

A clear definition of personalization can be based on the bureaucratic model of Weber, which we described earlier. Since depersonalization is one of the aims of this model, the characteristics of it can help to identify how to depersonalize, and therefore also how to personalize. Van Braam (1977) operationalized the bureaucratic model by identifying 20 ‘dimensions’. Some of these dimensions are more useful for defining personalization than others. Here we only mention the dimensions that are used to frame the concept. The dimensions are categorized in three groups.¹² The categories used are conditions of (1) appointment, (2) execution and (3) rewards. Since the characteristics derived from Van Braam define depersonalization and the aim of this section is to clarify the concept of personalization, the dimensions as mentioned here all are opposites of the model of Van Braam. Divided over these categories, the dimensions then are (based on Van Braam, 1977; Raadschelders, 1990, p.21; 1998, p.134):

Scheme A: *Conditions and characteristics of Appointment, Execution and Rewards of public functions*

I. Appointment	II. Execution	III. Rewards
Ownership of office	Formal rules and procedures do not exist	Irregular and variable income
Standard procedures for appointment are lacking	Means are not supplied (desk, paper, an office)	Ownership of office
Expertise plays an unimportant role	Lack of procedures of rational discipline and control	
Job security is not formalized		

Based on this scheme, three types of personalization can be identified. The first type is *personalization of appointment*. This means that individual officials literally *own* their function. Expertise plays an unimportant role. Gaining official positions depends on networks rather than on qualifications in terms of ability.

Secondly, *personalization of the execution* can be distinguished. Mechanisms of rational control and discipline as well as formal rules and procedures do not exist. The means needed for the execution have to be paid by the official.

Thirdly, *financial personalization* means that rewards depend on the official’s effort. One can think of mechanisms like profit in office, where the official buys an office and tries to make a profit out of it, which is his income (Raadschelders, 1998, p.158; see also Van Bockel & Noordegraaf, 2006). The ownership of an office can in this light be seen as a retirement arrangement.

These three types of personalization will be used to understand the practice of the schout-office in the Dutch Republic. But before we go into the schout function, we first shortly describe the governmental structure of the Dutch Republic.

3. Governmental structure of the Republic of the Seven United Provinces

In Dutch history the seventeenth century, also known as the Golden Century, is maybe the most famous period. In this century the province of Holland became the centre of world trade, the connection between ‘the East’ and Europe. It is also the century in which the Dutch Republic was finally recognized by its former ruler: Spain. We start our investigation in the century in which the Dutch Republic gained independence.

The organization of public safety in the seventeenth century differed by city and by region. The Republic counted seven provinces, which were united in the ‘States General’, a general representative body for all provinces and cities of the Republic. Each province had its own stadtholder, a function that reflects the time when a king reigned over the Lower Countries. A

¹² Van Braam distinguished between dimensions that have to do with (1) officials and (2) the way officials function. The categorization used here is added by the authors.

stadtholder can best be described as the representative of the king. The last king of the Lower Countries, Filips the Second, was abjured in the 'Acte van Verlatinghe' of 26 July 1581 by the stadtholder of that time: Prince William of Orange. William was the leader of the revolt against Spain. From that moment on the function of stadtholder steadily gained royal status, as was also the case with William of Orange and his heirs.

Public safety in early-modern Holland was one of the responsibilities of the stadtholder. There are two functions that were responsible for public safety, however, at different levels but both appointed by the stadtholder. Before we go into the practice of these functions, we first make clear how they were related to the stadtholder and each other.

At the very local level, that is the city, the schout combined the task of what we now would call public prosecutor and police commissioner. The schout can be seen as the representative of the stadtholder at the local level. Therefore he had a direct responsibility to the stadtholder (not always to the city!) (for example, Fruin, 1922; Fockema Andreae, 1969). The schout made new rules ('costuymen' or 'keuren'), arrested offenders of these rules and was also responsible for the execution of the sentence. In some cities the distinction was made between higher-schout and lower-schout. The lower-schout was only allowed to prosecute offenders of less significance. In rural areas the 'baljuw' was the representative of the stadtholder. His function is comparable to that of the higher-schout. Some villages had their own lower-schout. The smallest villages both had a higher or a lower schout and were part of the jurisdiction of the regional baljuw.

4. The *Schout* and *Baljuw*: daily practice

In this section the practice of the functions of schout and baljuw will be discussed in three sections. These sections are (according to the table above) *appointment*, *execution* and *rewards*. The function will thus be discussed in terms of the three types of personalization.

4.1 Appointment

All the functions were, in one way or another, for sale. This phenomenon was introduced in the fourteenth century, during the reign of Count William IV (1337-45) (Swart, 1949; Van den Arend, 1993, p.115). The easiest way was to buy an office from the landlord, i.e. the stadtholder. Of course they had to agree terms, for instance how much 'recognitiegelden' (sum of money) had to be paid every year. A public function also could be part of an obligation deal with the landlord.

Selection and appointment thus took place following a 'highest bidder mechanism'. If this were not the case, then the city council would select candidates for the function. This meant that members of the gentry networks were appointed. A relevant variant for that time is the existence of honorary posts. Some high ranked public functions brought about a lot of prestige. These functions often were used to reward relatives or friends of the landlord or city council.

Subsequently the possibility emerged to own a function. This meant that public functions became family property, for instance the baljuw of Noordwijk (Van den Arend, 1993, pp.166-7). In the seventeenth century, this structure became rare. However, at the national level a mechanism of transferring functions still existed. Since this was commonplace it seems reasonable to suppose this was also the case at the local level. (cf. Knevel, 2001, p.77).

4.2 Execution

For the execution of the function of schout or baljuw some means were needed. Information about who paid for stationery or uniforms has not yet been collected, but we do have information about who paid for the extra staffing. This is even more important than the stationery because paying for the extra staffing is an explicit indicator for how private-like the function of schout was structured. For example, schout Dominicus van Cralingen appoints a stand-in for the period that he is not able to execute the function. He paid for this substitute himself and kept on receiving commission (De Blécourt, 1912, p.6; Van den Arend, 1993, p.154). The reason why Dominicus van Cralingen was not able to execute the function himself is not clear, but a lot of schouten hired a substitute when they found another function, for instance with more social status. A good example is Cornelis de Witt,

who hired a substitute for one of his offices (Panhuysen, 2005). However, there are also examples of servants of the schout, who were paid by the city.

When a schout or baljuw was appointed, he received an *ambtsinstructie*, which contained the instructions for the job. These instructions contained the rules for the execution of the job. However, several cases show that the instructions were not strictly maintained.

4.3 Rewards

In the Dutch Republic the schout in most of the cases worked in a profit-in-office system. In practice the income of the schout or baljuw was the total amount of fines he levied (cf. Wagenaar & Van der Meij, 2005, p.27). In some cases a certain percentage of the fines had to be paid to the city, but in these cases the schout received a fixed amount per year.

One part of the income of the schout thus was a part of the fines he levied. But he had other possibilities to generate income. There was for example the possibility of selling household effects in public (Van den Arend, 1993, p.232). The following example shows how this mechanism can result in very odd situations (derived from Haarman, 1933, p.12; freely translated JvB):

Money obviously was the only goal they [the schouten] would pursue. [...] Because the schout represented the ruler, the ancient right of the ruler over the belongings of someone who committed suicide transferred to the schout. The schout prohibited to rescue drowning persons in his absence. The obvious reason for this prohibition was the fact that the belongings of the drowned person would be his, if it was suicide. The schout only had to record it was suicide, which was an administrative matter. Afraid of being punished, no one dared to rescue a drowning person, which was exactly what the schout wanted. Over time, the prohibition changed. Rescuing drowning people was allowed, but the victim's feet still had to hang in the water. If the poor victim did not survive the accident, the schout still could state it was a suicide bid.

As a result of this profit-in-office mechanism another possibility of generating income was invented: settlements, or in old Dutch 'composeren' (Haarman, 1933; Swart, 1949; Fockema Andreae, 1969; Faber, 1983). It depended on the deal the schout had either with the landlord or the city (depended on whose property the function was) whether he could freely offer a settlement for every offence. For the schout settlements were a very easy way of generating income.

The schout also offered some other services, for which he had to be paid. When someone for instance passed away outside the city walls, the schout had to grant permission to bring the body inside the city walls. His permission was also needed for a funeral at night. These permissions were for sale (Versteeg, 1925, p.15).

5. Effects of personalization

In the last paragraph we discussed the schout and baljuw with use of the three approaches of personalization. In this paragraph the same structure is used to discuss the effects of the personalized structure of the function of schout on the daily practice.

5.1 Personalization of appointment

In the Dutch Republic officials were appointed based on the auction mechanism. If this was not the case, the gentry-network in most other cases provided candidates. These networks gained influence and eventually dominated local affairs. Therefore it was of great importance to be a member of this network. One important way of doing this was to marry a daughter of an influential member of the gentry. Family ties in other words became of great importance; they could provide lucrative jobs, of which the function of schout was one of the most rewarding. This class structure also made social esteem an important factor. On the one hand the dominance of the gentry led to a form of oligarchy and nepotism, but on the other hand we can state that this gentry structure provided certain rules and codes which were important to obey in order to maintain membership of the gentry (cf. Knevel, 2001; Panhuysen, 2005) and thus the opportunity of getting jobs in the future.

5.2. Personalization of the execution

In the execution two aspects are of importance. The first one is rules, which have to be obeyed. We stated above that in most cases there was a formal instruction, but it was not always maintained. An example is that additional jobs were formally prohibited, but the cases of schouten and baljuws having other functions are countless. A lack of maintenance of these instructions obviously led to officials actively trying to find out how far they could actually go. There were even schouten who had a clause in their 'contract' that impeachment was only possible after they had earned the amount of money they had invested to buy the function.

The second aspect is paying for your own means. We have not found any positive or negative effects of this aspect, but one can expect a cost efficient approach by the schout if he has to pay for his servants himself. This expectation thus calls for further research.

5.3 Financial personalization

Schouten in most cases worked according to the profit in office mechanism. Many cases show the profit maximizing efforts of schouten. Fockema Andreae states that this behaviour was commonplace and socially accepted. However, some examples are quite extreme. For instance the effect of the mechanism of composeseren, the settlements. Basically all schouten were willing to make a settlement (Swart, 1949, p.77). Related to this is 'submissie' – submission. In this case the suspect immediately accepts the verdict of the court, without a proper procedure. As a result the suspect only had to pay a massive fine (Faber, 1983, p.35). Historical sources even tell us that some schouten offered what we could call a subscription: paying the schout once a year for not getting fined for the rest of the year (Fockema Andreae, 1969). This inevitably leads to class justice, since only the rich are able to arrange these settlements. In general one can state that schouten innovatively found ways to generate income (cf. the example on page 16).

6. Conclusion

In this paper we discussed three forms of personalization and their effects. The emergence of gentry networks and strategic marriages were presented as an effect of the personalization of appointment. Nepotism can be seen as a negative consequence, but the informal rules and codes attached to these networks can be conceived as positive effects. The lucrative terms that were agreed, as well as the weak maintenance of formal rules and instructions, can be seen as negative consequences of personalization of the execution. The profit in office mechanism obviously formed as an incentive to maximize income. Settlements and even subscriptions were invented to generate income.

Overlooking these effects of the three types of personalization, three problems for public service can be linked to these types. Linked to personalization of appointment a problem of integrity occurs. Functions are used to gain more social esteem and influence; members of the gentry use public functions to appoint their relatives. Personalization of the execution results in the problem of legitimacy. The weak maintenance of the rules and instructions led to many illegal actions by public servants. That means that the actions lacked legal grounds. The final type, financial personalization, might lead to the problem of effectiveness. Effectiveness deals with the question to what extent certain goals are achieved. The practice of the function of schout clearly shows that these goals were not the main reason for introducing certain innovative income maximizing mechanisms. The case of the schout shows problems of integrity, legitimacy and effectiveness in the public service of the Dutch Republic, as a consequence of personalized public functions. Therefore we always have to ask the question: '*Are we being served?*'.

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Optimists and pessimists: a revision of the nutritional status in Britain, eighteenth-nineteenth centuries

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Introduction

Anthropometric data have been extensively used in order to provide a partial answer to the debate about the impact of early industrialization on the standard of living of the British population. The literature is virtually divided between those who advocate the benevolence of the early industrialization process and those who lean toward a worsening of the workers' quality of life. In this context, the work on British anthropometric data of Roderick Floud, Kenneth Wachter, and Annabel Gregory (1990) represents an authoritative contribution.¹³ Their most important finding probably concerns the increasing trend in nutritional status from the late 1780s to the early 1820s, a remarkable support to the optimistic view. Yet, the British Army sample, when analysed separately, shows a remarkable declining trend from the 1780s to the end of the Napoleonic wars. Our findings are consistent with the subsistence crisis of the late eighteenth century, the trend in food prices and the more recent real wages estimates.¹⁴

Data

The dataset employed in this paper consists uniquely of soldiers recruited for the British Army covering the cohorts 1740-1870. This dataset, together with records of the Royal Marines and the Marine Society, was previously analysed by Floud et al. Our work differs in three aspects: (i) we focus only on the British Army sample born in Britain; (ii) we employ the truncated maximum likelihood estimator which allows us to perform a multivariate analysis; (iii) we use the information on the place of recruitment to make some inference on British internal migration.

From a graphical inspection of height distributions, average and standard deviation of the soldier's age, we found a sort of 'structural break' in the recruiting process starting with the recruitment year 1820; a closer look at the army composition can provide an explanation for such a break. The army was manned with volunteers but, given the chronic shortage of men, local militia at county level were employed as well. These county militia were based on a forced recruitment among the male population aged 18-50 chosen by ballot. As pointed out by Floud et al. (p.34), militiamen were also incorporated in the regular forces. The institute of the militia was disbanded in 1816 to be newly convened only in 1852 at the onset of the Crimean War. Therefore, while the sample recruited until the defeat of Napoleon was constituted by volunteers and a random draw from the male population, after 1820 the sample is only made of young volunteers resulting in a smaller average and standard deviation of soldier's age (see figures 1 and 2). We are not able to identify the two typologies of soldiers, but the difference in the underlying population for the two periods suggested separate analysis of pre- and post-1820 recruitment samples.¹⁵

¹³ Floud, R., Wachter, K., and Gregory, A., *Height, health and history: Nutritional status in the United Kingdom, 1750-1980*. Cambridge: Cambridge University Press, 1990.

¹⁴ Feinstein, C.H., 'Pessimism Perpetuated: Real Wages and the Standard of Living in Britain during and after the Industrial Revolution'. *Journal of Economic History* 58, (1998): pp.625-58.

¹⁵ The analysis of the full sample does not alter qualitatively our results.

Figure 1: Average of soldier's age by year of recruitment

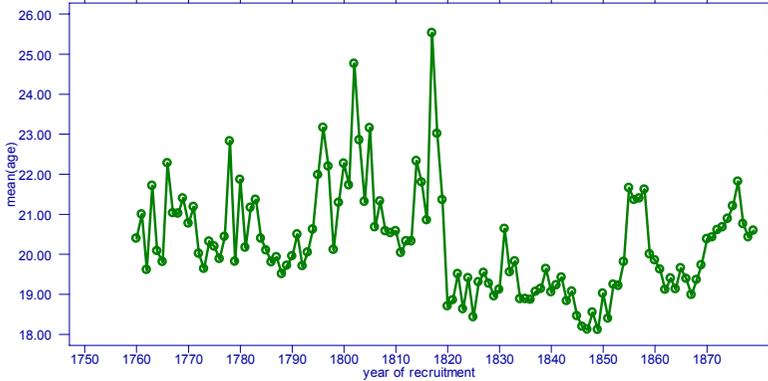
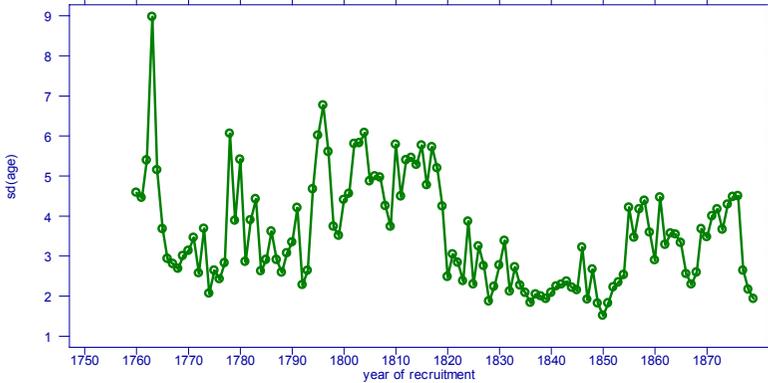


Figure 2: Standard deviation of soldier's age by year of recruitment



Regarding the soldier's origin, we generated 13 wage-regions following the classification of Hunt,¹⁶ about the occupation, we followed the industrial classification provided by Armstrong.¹⁷ The recruitment lists, additionally to the county of birth, also present information on the county of recruitment. Adopting the 13 wage-regions as geographic unit of reference, we consider migrants the soldiers that were recruited in a different region with respect to the birth's region. A similar strategy was adopted by Nicholas & Shergold (1987) for a sample of British convicts used to study inter-county labour mobility.

As usual when dealing with military data sources, truncated height distributions represent an important statistical issue. In their previous work Floud et al. employed two methods: the *quantile bend estimator* (QBE)¹⁸ and the *reduced sample maximum likelihood estimator*. Some studies showed the superiority of the MLE with respect to QBE as the former allows the specification of a

¹⁶ Hunt, E.H., *Regional Wage Variation in Britain 1850-1914*. London, 1973.

¹⁷ Armstrong, W.A., 'The use of information about occupation'. In E.A. Wrigley, ed., *Nineteenth-century society: Essays in the use of quantitative methods for the study of social data*. Cambridge: Cambridge University Press, 1972.

¹⁸ Wachter, K.W. and Trussell, J., 'Estimating historical heights'. *Journal of the American Statistical Association* 77, (1982): pp.279-303.

flexible truncation point, the estimation of the population standard deviation and it is robust to rounding in the data.¹⁹ In this work we shall use consistently the truncated- normal ML estimator.

Table 1: *Descriptive statistics*

	Whole sample	Recruited before 1820	Recruited after 1820
Mean height (cm)	170.1 (5.32)	171.2 (5.94)	169.2 (4.64)
Mean age	20.6 (3.92)	21.5 (4.63)	20.0 (3.15)
<i>Birth region</i>			
Central Scotland	11.6	13.6	10.1
Cumberland	1.5	2.3	1.0
Lancashire	21.3	18.3	23.4
Lincolnshire	1.7	1.9	1.6
London	8.8	5.7	11.0
Midlands	18.1	16.3	19.4
Northern Scotland	7.2	12.0	3.5
Northumberland	1.5	2.1	1.1
Rural Southeast	12.9	13.8	12.3
Rural Wales	3.5	1.9	4.7
South Scotland	2.2	3.2	1.3
South Wales	1.0	1.1	1.0
Southwest	8.8	7.7	9.7
<i>Occupation</i>			
Agriculture	2.3	3.1	1.7
Building	6.8	7.8	6.1
Dealing	1.7	1.6	1.8
Domestic	2.8	1.6	3.8
Labourers	34.3	30.3	37.3
Manufacturing	30.9	36.0	27.0
Mining	3.1	2.3	3.7
Residual	16.0	16.3	15.9
Service	1.3	0.7	1.8
Transport	0.8	0.4	1.1
Observation	40,374	17,225	23,149

Note: standard deviation in parenthesis.

Nutritional status

The trend in nutritional status is estimated regressing height measures on cohort dummy variables and a further set of control variables such as age, region of provenance and occupation. A binary variable (*urban*) is set equal to one if the soldier was born in one of the listed cities: London, Manchester, Liverpool, Edinburgh, Glasgow, Leeds, Sheffield, and Birmingham. Additional dummy variables have been generated in order to control for possible peculiar recruiting practices during the Napoleonic Wars and the Crimean War, two major events for the British Army.

Results of the truncated regressions for the two sub-periods are presented in table 2. Using the estimated coefficients we obtain the trend of figure 3. The pattern is overall decreasing especially for the cohorts 1780-1810, a period over which much of the literature on the standard of living has been

¹⁹ A'Hearn, B., 'A restricted maximum likelihood estimator for truncated height samples'. *Economics and Human Biology* 2, (2004): pp.5-19.

vividly debated. The successive period 1810-25 is characterized by fluctuations, yet the trend looks increasing. The harshness of the 1830s is confirmed also by our estimates and a decreasing trend in nutritional status seems to persist until the mid-1860s.

Table 2: *Truncated regression*

Variables	Recruited before 1820	Recruited after 1820
<i>Age</i>	Output omitted	Output omitted
<i>Birth-cohort</i>	Output omitted	Output omitted
<i>Origin</i>		
London and Home Counties	<i>Reference group</i>	<i>Reference group</i>
Southwest	0.168 [0.298]	0.349 [0.304]
Rural Southeast	-0.168 [0.247]	0.314 [0.244]
South Wales	-0.042 [0.390]	0.046 [0.214]
Rural Wales	0.174 [0.337]	0.111 [0.287]
Midlands	0.441* [0.251]	-0.105 [0.279]
Lincolnshire	0.265 [0.230]	0.490** [0.194]
Lancashire	0.684*** [0.251]	0.472** [0.204]
Cumberland	1.345*** [0.264]	1.432*** [0.201]
Northumberland	1.257*** [0.240]	1.367*** [0.353]
South Scotland	0.873*** [0.248]	1.688*** [0.222]
Central Scotland	0.860*** [0.250]	1.700*** [0.244]
Northern Scotland	0.716*** [0.245]	1.575*** [0.269]
Urban	-0.132 [0.207]	-0.632** [0.274]
<i>Occupation</i>		
Manufacturing	<i>Reference group</i>	<i>Reference group</i>
Agri	0.756*** [0.143]	0.339 [0.232]
Building	0.092 [0.106]	0.142* [0.080]
Dealing	0.261 [0.195]	0.372 [0.256]
Domestic	-0.320* [0.187]	-0.396*** [0.117]
Labourers	0.008 [0.086]	0.201*** [0.074]

Mining	0.212 [0.170]	0.005 [0.142]
Residual	-0.011 [0.112]	0.069 [0.131]
Service	0.524 [0.382]	0.980*** [0.124]
Transport	-0.260 [0.520]	0.095 [0.174]
Recruitment Napoleonic Wars	-0.504*** [0.132]	
Recruitment Crimean wars		-0.093 [0.102]
Constant	67.134*** [0.264]	65.895*** [0.296]
Observations	13,894	21,651

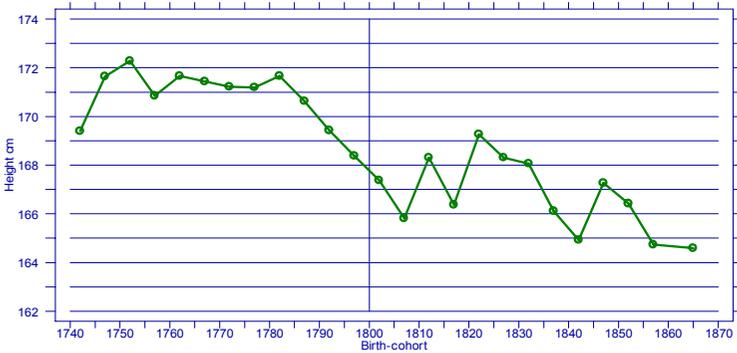
Note: Robust standard errors in brackets; * significant at 10%, ** significant at 5%, *** significant at 1%. Coefficients associated to age and birth cohorts are omitted. The latter are presented graphically in figure 3.

For both centuries the evidence points to a remarkable nutritional advantage of the northern regions with respect to the region of London and the Home Counties. For the eighteenth century the largest coefficient is associated with the region of Cumberland, whereas for the nineteenth century the Scottish regions (in particular Central Scotland) had the highest height advantage. Interestingly, we find an urban penalty of about 1.6cm only starting from the nineteenth century: the disease environment together with more expensive food of (probably) lower quality is a possible explanation for the height penalty. Soldiers previously employed in agriculture had a significant height premium in the eighteenth century (c.2cm) while it is not statistically different from manufacturing for the successive period. Those employed in domestic activities had through the whole period a height penalty between 0.8 and 1cm. Labourers and those employed in the service sector (which includes also civil servants) in the nineteenth century were 0.5 and 2.5cm taller compared to the reference group. Soldiers recruited during the Napoleonic Wars were on average shorter by circa 1.3cm, whereas there is no systematic difference for those recruited during the Crimean War (and Indian Mutiny).

The long-term increase in food prices, corroborated by the subsistence crisis of the late eighteenth century, is consistent with the declining trend in height which started during the 1780s. In addition, the phenomenon of the enclosures, accelerated by the increase in the land's value, might have negatively affected the nutritional status of the labourers who constitute the larger share of our sample. On one side labourers were deprived of a source of income (land), and on the other hand they were more exposed to food price fluctuations. The loss of income due to the decline of the cottage industry in the rural southeast is another possible explanation consistent with the estimated lower nutritional status of the south with respect to the northern regions.²⁰

²⁰ See Boyer, G.R. *An Economic History of the English Poor Law*, Cambridge: Cambridge University Press, 1990.

Figure 3: British height trend



Note: The vertical line separates the two regression samples.

Internal mobility and the nutritional status

Studies on British internal migration for the period before the 1851 census are rather exceptional. Nicholas and Shergold analysed convicts’ data in order to assess the main determinants of inter-county labour mobility between 1780 and 1840.²¹ They found that the probability of migrating increased with education and training, and that skill was positively correlated with distance. As expected, the probability of moving was lower for urban residents. The British army sample has detailed information on both the place of birth and the recruitment location and thus it allows us to investigate internal migration for a large time span. Of this sub-sample, circa 30 per cent of the soldiers can be regarded as migrant. This figure is very similar to the share of migrants in Nicholas and Shergold’s sample.

We aim to investigate (i) the geographic pattern and occupational characteristics of internal migration, and (ii) the migrants’ nutritional status. Given the superior skills of the migrants, we would expect to find a superior nutritional status for the migrants.

Table 3: Origin and destination of migrants

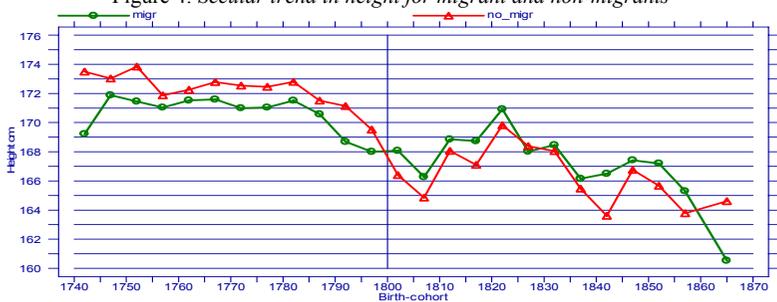
Region	Place of birth		Place of recruitment	
	Frequency	Percent	Frequency	Percent
Central Scotland	785	7.7	1000	9.9
Cumberland	205	2.0	203	2.0
Lancashire	1588	15.6	1496	14.7
Lincolnshire	262	2.6	333	3.3
London	578	5.7	3227	31.8
Midlands	1774	17.5	883	8.7
Northern Scotland	1022	10.1	269	2.7
Northumberland	321	3.2	301	3.0
Rural Southeast	1625	16.0	1373	13.5
Rural Wales	427	4.2	263	2.6
South Scotland	444	4.4	248	2.4
South Wales	186	1.8	91	0.9
Southwest	939	9.3	469	4.6
Total	10156	100	10156	100

21 Nicholas, S. and Shergold, P.R., ‘Intercounty Labour Mobility during the Industrial Revolution: Evidence from Australian Transportation Records’. Oxford Economic papers 39, (1987): pp.624-40.

Estimating a binary probit model we can compute the probability of being a migrant controlling for age, place of birth, place of recruitment, and occupation. In particular we estimated the marginal effects, namely the change in probability of being a mover for an infinitesimal change in the covariates.²² Since we are interested in the social extraction of the migrants, for this estimation we employed the social stratification suggested by Armstrong which divides the working population according to the degree of skills incorporated in the job.²³ The results of the estimation (not presented in this draft) show that, with respect to the unskilled professionals, intermediate, and skilled had 40 per cent, 10 per cent, and 2 per cent more probability of being a mover, respectively. The geographic covariates show a negative change in probability for those born in cities (-4 per cent) or born in the region of London and Home Counties (-8 per cent). Arrival regions were London (+59 per cent), Northumberland and Durham (+40 per cent), and Yorkshire N.R. and E.R. (+37 per cent). *Ceteris paribus*, the least preferred destination in terms of migration was Northern Scotland. The Napoleonic Wars were an important pull factor (+8 per cent) whereas the Crimean War shows a negative impact of similar magnitude.

These preliminary results, consistent with previous studies, suggest a skilled nature of migration towards more industrialized regions. Yet, evidence about migrants' nutritional status with respect to the non-movers is apparently mixed. We performed separate height regressions both for movers and non-movers following the estimation strategy illustrated in the previous section. The resulting trends are shown in figure 4. For the whole of the eighteenth century the migrants' nutritional status was certainly not superior compared to the non-migrants, while for the nineteenth century it seems to be the opposite. An explanation for the difference in height between movers and non-movers resides in the institute of the 'ballot militia'.²⁴ In fact, it is reasonable to assume that the share of 'ballot militia' was highest among the non-movers. As the militiamen, who in principle had a better alternative to the army, were randomly chosen and compulsorily affiliated to the militia, they presumably had a superior nutritional status with respect to those who decided to migrate.²⁵ After the Napoleonic Wars, with the abolition of the 'ballot militia', the height difference between movers and non-movers reflects the skill/unskilled divide between migrants and non-migrants. Separate probit estimates by sub-periods show that the probability of being a mover was the same for skilled and unskilled during the existence of the 'ballot militia'; after the abolition of the institute skilled people were more likely to move compared to unskilled. These two findings support our explanation for the trends of figure 4.

Figure 4: Secular trend in height for migrant and non-migrants



Note: the trend for migrants is standardized for an adult born in the Midlands and recruited in the region of London and Home counties; the non-migrant was born and recruited in the Midlands. The vertical line separates the two regression samples.

²² It is a unitary change for dummy variables.

²³ See note 3.

²⁴ See section on data for details.

²⁵ Likely militiamen had a superior nutritional status with respect to both movers and non-movers.

Conclusion

The trend in nutritional status in Britain started to decline around the 1780s, reaching a nadir around 1810. This finding is consistent with the recorded long-term increase in food prices, and the subsistence crisis of the late eighteenth century. A partial recovery took place in the period 1810-25. Thereafter the trend is newly decreasing until 1865. The results are robust to different specifications. There is a strong north-south gradient in terms of nutritional status: people from Scottish regions enjoyed systematically a superior nutritional status. We found evidence of an urban penalty starting from the nineteenth century: Disease environment, food quality and food prices are the usual suspects. Furthermore, soldiers previously working in agriculture had a significant height premium while domestic servants showed consistently a height penalty.

The analysis of internal migration shows that the region of residence (proxied by the recruitment county) as well as the region of birth had an effect on attained height. Consistently with the main literature we found a 'skilled' migration towards industrial regions. Yet, in order to make a clear inference about the migrants' nutritional status we have to take into consideration the different composition of the army due to the institute of the 'ballot militia' which presumably introduced skilled people of the working class among the non-movers. After the abolition of this institute, the evidence points to a migrants' nutritional advantage with respect to the non-migrants.

Manorial courts and management of the land in early Stuart England

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This paper explores the ways in which economic resources were organized and distributed in early modern England, focusing on the role of the manorial courts in regulating the ownership and use of land. I want, in particular, to look at the nature and activities of manorial juries, and to explore the ways in which they sought to enforce manorial custom and by-law through presentments made to the manor courts. Although historians have sometimes argued that manorial jurisdiction was in terminal decline during the late sixteenth and early-seventeenth centuries, it is clear that this applied only to criminal jurisdiction. During the period covered by this paper, the manor courts continued to play a vital role in economic organization, overseeing the rules governing ownership, land transfer and the distribution of communal resources. The ways in which the courts operated, I want to suggest, reflected the interests of the 'middling' villagers who acted as jurymen. They used the courts to protect communal resources from over-exploitation by those new to the community and from avaricious members of the community itself. They worked to promote social harmony and to avoid potential discord, seeking whenever possible to maintain the status quo. They were not interested in reforming – or improving – the economic state of their community but rather in preserving it.

As such, the manor courts were not the instruments of seigneurial control but rather the tools of communal self-governance, in which lords and tenants both had a role to play. As this paper shows, jurymen often acted independently of their lords. This paper is in many ways a study in the political history of economic activity, exploring the quality of relations between jurors and other groups in manorial society. It seeks to make connections between two historiographical debates: the first concerning popular uses of the law and legal institutions in early modern England; and the second that surrounding the nature of gentry estate policy. To understand the processes of economic change it is necessary to look closely at the decisions taken by actors in a wide range of social roles. The development of estate policy during a period of significant economic change reflected the interests not just of landlords but also of their senior tenantry.

This paper is based on the evidence of manorial court papers and, in particular, on the original presentments of juries surviving for the counties of Middlesex and Essex. As the table presented here (appendix I) shows, presentments survive unevenly and some manors are far better documented than others. (The figures given in parentheses along the left-hand side of the table show the number of surviving sets of original presentments for each manor and the years they cover.) Presentments were generally written on paper and in English, submitted to the steward before a court met. They need to be distinguished from presentments as recorded in the court rolls, drawn up by the steward after a court had met, generally translated into Latin and written on parchment. It was not uncommon, as my own research and that of Walter King suggests, for stewards to revise lists of presentments before entering them into the rolls, generally in an abridged form, sometimes leaving out certain presentments altogether.¹ It is not immediately clear why this should have been so but it is plausible that the rolls record only those men found guilty for the offences for which they were presented. If this is so, then it would be further evidence for King's contention that the manorial courts did not mete out arbitrary justice, that to be presented for an offence was not the same as being found guilty

¹ W.J. King, 'Untapped Resources for Social Historians: Court Leet Records', *Journal of Social History*, 15 (1982), p.700; King, 'Leet Jurors and the Search for Law and Order in Seventeenth-Century England: 'Galling Persecution' or Reasonable Justice?', *Histoire Sociale-Social History*, 13 (1980), p.307. A much earlier – but still useful work – also drew attention to the differences between manorial papers and rolls: M. Bateson, 'The English and Latin Versions of a Peterborough Court Leet, 1461', *EHR*, 19 (1904), pp.526-8.

of it.² Manorial rolls provide evidence only of the final outcome of proceedings and not of the full range of business that came before the courts. Manorial papers – and in particular original presentments – offer an insight into the daily workings of the courts rather than simply a record of the final outcome.

I have found 56 original presentments surviving for the two counties, covering in total some 12 manors (2 in Middlesex, and 10 in Essex), and nearly all dating from after 1600. Presentments were usually of specific and specified individuals who had in some way broken local regulations or failed to comply with the orders of a previous court. A presentment gives the name of the offender, the offence for which he was presented and then usually states the date by which the offence was to be made good with a note of the fine that would be levied were it neglected. A typical presentment looks like this from East Bedfont in Middlesex:

Item we payne Richard Bannister that he make his fence betwene John Page & himself, betwixt this and twelthday next on paine of – vi^s³

Or these from the Essex manor of Ingatestone:

Item we payne Nycklas Ralling to carie awaye his dung and not hereafter to anye the hyghwaye anye more with his dunge on payne of forfiting to the lord for evrie such default – iii^s iiiii^d

Item wee presente Lancelott Allyne to scoure his ditche which is betwene the ground of Paule Stockes and his, to be sufficiently done betwene this [and] maye daye next in paine to forfeite to the Lord: tenn shillings.⁴

The sums demanded in fines varied according to the offence and from manor to manor, set presumably by the dictates of custom. Between three and four shillings seems to have been standard on most manors, although the records contain examples of fines set as low as two pence and as high as forty shillings. The highest fines were levied on those presented for harbouring vagrants, a central preoccupation of manorial jurors throughout the period. The amount of time given to offenders in which to comply with the court's orders also varied a great deal. People were generally given between two and three months in which to mend broken fences or to scour ditches – in other words, until the next meeting of the court. If the matter was considered particularly urgent, however, a much tighter timetable would be dictated. In Ingatestone, for example, a man was given only a week in which to pull down a cottage that was obstructing the highway with a fine of thirty shillings were it not to be done. Tenants charged with more complex tasks were usually given longer in which to accomplish them. Again, in Ingatestone one man was given six months in which to make repairs to his house and another seven months in which to build a dam and redirect a water course running through his smallholding. It was a flexible system and jurors were clearly prepared to adapt their orders according to practical circumstances. There was no point in giving people orders they could not possibly fulfil.

The table in Appendix I breaks down the offences presented by jurors and organizes them into subcategories. The single largest number of presentments were those relating to the maintenance of boundaries and markers, fences and hedges in particular. Orders to clear waterways and to scour ditches also fall partly in this category. While ditches obviously served important functions of drainage and irrigation, they also frequently acted as boundary lines between properties and juries sometimes make it clear that it was for this reason that they were concerned with their upkeep. After

² King, 'Leet Jurors', 306, pp.314-5.

³ L[ondon] M[etropolitan] A[rchive] ACC/1379/322.

⁴ E[sex] R[ecord] O[ffice] D/DP/M122, 'The leete and court barron', 12 April 1610. Court papers held by the Essex Record Office are organized into unsorted and unnumbered bundles. Rather than assigning an arbitrary numbering system to them myself I give reference to them according to their original endorsement and dating.

boundaries, juries were concerned that rights of way be kept open and in good repair. The highways were to be free of obstructions, footpaths maintained and kept open, and bridges kept in a satisfactory state of repair. Next came offences relating to the regulation of communal resources, in particular common land. Illegal enclosures were presented, as were those who overcharged the commons. The numbers of beasts any individual was allowed to keep on the commons was usually limited by manorial custom and bylaws, as were the types of animal considered 'commonable'. Presentments for keeping 'uncommonable' beasts on the commons, generally pigs or geese, were made with relative frequency. Access to wood for fuel and rebuilding was also regulated through the manorial courts, and individuals were presented for taking excess amounts of wood or for 'hedgbreaking', an offence typically associated with the poorest members of the community and especially their children.

Protecting communal resources from encroachment meant controlling the actions of opportunistic or careless members of their own community. It also meant preventing, or at least limiting, the chances of outsiders gaining access to them. A wariness of outsiders is evident in the presentments of local inhabitants found to be housing 'inmates' – i.e. giving shelter to vagrants or subletting property to poor newcomers. It should be noted that the manorial courts had little power to move on the vagrants themselves, and so concentrated instead on punishing those who gave them shelter.

Manorial juries thus dealt principally with matters connected with economic regulation. That they acted with a degree of independence is suggested by the fact that they often presented their lords themselves as defaulters. So in 1616 the jury of Hatfield Broadoak found that their lord, Sir Francis Barrington, was 'to Make his fffence seficiently in the common marshes'; while the jurors of Margaretting found that their lord, Sir John Petre, had to repair a bridge, 'mende the hulde at ynGatt gate & mende the dyche as moche as nedyth'.⁵ Further it is clear that juries were often more concerned with getting a job done than with collecting in fines (a matter that arguably was of greater importance to lords). It is fairly common, for instance, to find juries reporting on individuals who had failed to comply with a previous order of the court and, instead of calling in the fine, granting the offender a further period of time in which to make good their offence.⁶ While manorial rolls contain plentiful evidence that routine fines – such as heriots, and other payments made upon the transfer of land – were paid, there are far fewer recorded examples of fines being paid for breaching manorial regulations.

Overwhelmingly the presentments reveal jurors' desire to promote social harmony and to forestall potential conflict. This is evident in the numerous presentments relating to the maintenance of clear boundaries. The importance attached to maintaining clear markers was discussed in general terms by John Norden. He claimed that the art of surveying had its origins in Egypt under Ptolemy 'where the River Nilus ... overflowed the banckes (as at this day it doth about harvest) the violence of the inundations were such, as they confounded the marks & bounds of all the grounds that were surrounded, in such sort as none knew his owne land'.⁷ From this Norden drew the lesson that mathematically-sophisticated surveys were an essential ingredient of successful land management; jurors were more likely to believe it was necessary continually to scrutinize the conditions of ditches, fences and hedges and to order those responsible for their upkeep to be diligent. Landlords themselves seem to have agreed and devoted a great deal of time and attention to the state of hedges and fences on their land. John Petre's account books show that casual labourers were frequently employed in hedging and fencing; and it is clear that Sir Nicholas Bacon gave the same careful consideration to their upkeep on his Norfolk estates as he did to matters of state. Such matters seem

⁵ ERO D/DBa/M43, 'The cort holden and kept for the lord of his manner', 25 May 1616; D/DP/M683, untitled and undated presentment.

⁶ For example, ERO D/DP/M122, 'The Leete and Court Barron', 29 March 1613; D/DP/M683, 'The verdecit of the Leete and Courte baron', 1617; D/DP/M944A, 'The verdict of the Jury of the Leete & corte', 4 June 1615.

⁷ J[ohn] N[orden], *The Surveiors Dialogue* (1618), sig. B8v.

trivial to a modern audience; the sheer number of presentments within this category suggests that jurors were of a different opinion.⁸

In an age with no modern land registry, ownership could be difficult to prove and so a contentious issue. An examination of equity court material shows that disputes over ownership were a frequent source of conflict and it may have been as a way of avoiding these that jurors were so keen to see boundary lines and markers maintained.⁹ The positioning of borders and markers was defined by custom and parcels of land were recognized as specific and unchanging units. Thus, if a hedge or fence were moved it would be an act of encroachment on another's land. Jurors in Ingatestone referring to such a case – 'a controversie of a hedge & ditch' – wrote that an attempted encroachment had become the subject of 'debate'. In Fristling Hall one Anthony Reddock was pained 'to pull up his hegge and set it right wher it ought to stand'.¹⁰

If jurors were concerned with defining the spatial limits of their community, so too were they anxious to define its social boundaries. Many of the presentments reflect a desire to lay down and enforce the rules governing community membership and the privileges associated with – and exclusive to – that membership. Maintaining exclusivity was of particular importance when a growing population placed ever-greater pressure on resources and jurors worked hard to ensure that the claims of insiders were protected from outside encroachment. The same pressures also demanded that the uses made of communal resources by insiders themselves be regulated, that individual greed not be allowed to wreck the interests of the majority.¹¹ Juries played a central role in the allocation of resources, determining and enforcing the rules of entitlement and so helping to shape notions of community and belonging in rural society. Steve Hindle has written that the system of institutionalized poor relief 'reminded the poor of (indeed, actually put them in) their place', both geographically and socially.¹² A similar process of definition was underway when juries drew up regulations relating to rights to graze animals on common fields and when they sought to uphold the rules governing access to fuel and timber. Regulations which prohibited people from sheltering vagrants or subletting property to poor outsiders also fit into this apparent desire to mark out and defend social boundaries. In this way, juries 'subordinated individual interests or private rights to the collective good'. Or, as the 'middling' villagers of Swallowfield put it in 1596, 'non of us is ruler of hym selfe, but the whole companye or the moste parte is ruler of us all'.¹³

The jurors of West Drayton demanded in 1625 that no bachelor or servant be allowed to keep cattle on the common. These men, lacking the status of heads of household, were debarred from full community membership and the entitlements that went with it. The jurors further prohibited any from keeping cattle on behalf of 'any out dwellers'. In Hatfield Broadoak, jurors demanded that no 'straungeres' were to keep cattle on the lord's waste and decreed punishments for any tenant who commoned animals that were not their own.¹⁴ Lacking authority over those who were not tenants of the manor, jurors could do little to outsiders but concentrated instead on punishing members of their own communities who had assisted them. The same tendency has already been noted in regard to

⁸ ERO D/DP/A18, ff. 46r-57r; D/DP/A19, ff. 62r-68r; D/DP/A22, ff. 48r-50v. For Bacon, see: *The Papers of Nathaniel Bacon of Stiffkey: Volume I, 1556-1577*, ed. A.H. Smith, G.M. Baker and R.W. Kenny (Norwich, 1979), xviii, 69.

⁹ Of the 228 Pleadings in the Duchy of Lancaster files (NA DL/1) which originated in Middlesex and Essex between 1558 and 1629, some 91 (almost 40%) concerned disputed claims to possession.

¹⁰ ERO D/DP/M122, 'The Extract of the Leete and Court Baron', 30 March 1621; D/DP/M744, 'The verdytt of the courte baron', 9 April 1614.

¹¹ In Hatfield Broadoak jurors stated explicitly that both 'ouer selves and straungers' were bound by custom and that no man, regardless of his position, was allowed to overcharge the common: ERO D/DBa/M54, 'The cort holden and kept for the lord of this manner', 25 May 1616.

¹² S. Hindle, 'Exhortation and entitlement: negotiating inequality in English rural communities, 1550-1650', in M.J. Braddick and J. Walter (eds.), *Negotiating Power in Early Modern Society* (Cambridge, 2001), p.113.

¹³ King, 'Early Stuart Courts Leet', 278; S. Hindle, 'Hierarchy and Community in the Elizabethan Parish: The Swallowfield Articles of 1596', *HJ*, 42 (1999), 849 (article [6]).

¹⁴ LMA ACC/0446/M52, f. 2r; ERO D/DBa/M44, 'The cort holden and kept for the lord of this manner', 25 May 1616.

vagrants and poor sub-tenants. Juries could not themselves evict these undesirables, but they could put pressure on those who helped them.

I have not had time in this paper to discuss those occasions when lords and juries came into conflict. That would take us beyond the manor and into the equity courts, a route taken by several early modern communities. Such cases were generally brought by a lord whose plans for improving his estate – often through enclosure – were frustrated by jurors. Then it was usual for him to accuse the jurymen of having overstepped the bounds of their authority and demand their judgement be overturned by the higher authority. In such cases juries acted as the representatives of their communities. When lords and their tenants came into conflict the latter were in a powerful position to obstruct seigneurial wishes. As the eyes and ears of the manorial system, jurors supported seigneurial authority by acting as a source of information. At the same time, however, they exercised discretion in the exercise of their role, focusing their energies on presenting those offences they considered particularly important. They used the manor courts to promote their own views of community and entitlement, seeking to protect local economic resources from the depredations of incomers or from over-exploitation by insiders.

Appendix 1: Table showing the total original presentments for manors in Middlesex and Essex arranged into subcategories by type of offence

	Drainage Boundaries		Boundaries	Rights of way		Common Resources			Minor felonies			Poor law	TOTALS
	Ditches	Waterways	Hedges/fences	Highways	Bridges	Enclosure	Overcharging	Uncomm/onable beasts	Timber/hedgebreaking	Drunkenness	Assault	Inmates	
Battles Hall (1) 1599	0	0	1	0	1	0	0	0	2	0	0	1	5
East Beadont (8) 1601-3	2	0	10	1	1	1	1	7	0	0	0	1	24
West Draxton (7) 1607-27	5	2	6	1	1	0	1	3	1	1	1	4	26
Ingatestone (13) 1609-22	18	3	8	5	1	0	0	0	2	0	0	2	39
Margaretting (7) 1609-22	7	0	3	1	2	3	0	0	1	0	0	3	20
Clavering (1) 1611	1	0	0	0	0	0	6	0	0	0	0	1	8
Buffsbury and Stock (5) 1611-13	0	3	0	23	0	0	0	0	0	0	0	5	31
Hatfield Broadoak (4) 1612-16	6	0	4	15	1	0	7	0	2	1	1	2	39
Great Burstead (5) 1613-21	13	0	12	6	0	7	0	0	3	0	0	0	41
Burntswell (1) 1614	0	0	0	0	0	1	0	1	0	0	0	0	2
Impney Hall (3) 1615-25	0	5	0	2	0	0	0	1	0	0	0	0	8
East Horneden (1) 1616	2	1	0	0	0	0	0	0	0	0	0	0	6
Totals by category	53	14	44	54	7	12	15	12	11	2	2	19	245
	67		44	61			50		4			19	245

Columns represent type of offence; rows give the name of manor and, in parentheses, the number of surviving sets of presentments with dates.

Land redistributions and the Russian peasant commune in the nineteenth century¹⁵

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A key debate in nineteenth-century Russian economic history is how the peasant commune (the *obshchina* or *mir*) impinged upon rural economic development. Since communal villages – not individual households – received formal land rights following the end of serfdom in 1861, scholars have emphasized two aspects of how such a system of collective property rights potentially hindered agricultural productivity growth. First, communal agriculture was conducted under the open-field system, with the scattered arable strips and community coordination of agricultural tasks familiar to historians of early modern England. Second, communes engaged in land *peredely*, or repartitions, where the usage rights to plots in the open fields were pooled and then reallocated within the commune. This practice is what distinguished the Russian open fields from variants of the system in other parts of Europe, where plots were typically held under hereditary household tenure. Gerschenkron (1965) and other scholars of rural Russia argue that these repartitions created uncertainty over future tenure on a particular plot, which undermined incentives to improve soil fertility and invest in new crops or technologies.¹⁶ This hindered productivity growth, which limited the agricultural surplus available to finance industrial development.

Drawing on a unique dataset from Moscow province that matches information on re-allotments with socio-economic and yield data, I find some evidence for a negative association between the frequency of repartitions and grain productivity. However, accounts of repartitions suggest that they were not random shocks for the households involved. Rather, repartitions were endogenous institutional adjustments of land holdings in response to imperfect factor markets and collective tax obligations. Empirical evidence supports this interpretation – the frequency of repartitions was positively associated with indicators of land market frictions and with the level of communal taxes and land payments.

Open-field farming and communal repartitions

Russian peasant households typically cultivated long narrow strips (*polosi*) that were scattered (*vnutrinadel'naia cherezpolositsa*) across different parts of each field. Insurance against crop losses in one part of a field was provided by holding plots in the other sections. Households independently farmed these plots under restrictions imposed by communal crop rotations and grazing practices. In the English case, each household held private and perpetual rights to specific plots within the open fields. This encouraged them to invest in soil maintenance and to employ new techniques when possible. Moreover, these individualized property rights supported an active market in arable strips.¹⁷ In contrast, the distinguishing feature of most Russian open-field communities – both before and after Emancipation – was that land rights were vested in the village commune. Communal authorities and the village *skhod*, or assembly, had the authority to designate which households could farm each plot of the community's land. Communes could, and did, occasionally redistribute usage rights to individual strips among member households.¹⁸ These redistributions either changed the allocation of

¹⁵ This paper summarizes a portion of the findings of a larger project on communal institutions and Russian economic development between 1861 and 1905. An extended version of this paper is available from the author.

¹⁶ 'The peasant does not grow attached to a piece of ground which he does not expect to keep and only strives to draw from it the greatest possible immediate profit, without a thought for the morrow' (Leroy-Beaulieu, 1893, Vol. 1, p.513)

¹⁷ Important discussions of property rights and farming practices in English open-field villages include Bekar and Reed (2001), McCloskey (1989), and Overton (1996, pp.22-35).

¹⁸ On serf estates, land rights were often passed entirely over to the village community in exchange for seigniorial obligations. Occasionally, estate officials did interfere in the repartition process (e.g. Hoch, 1986). In the western

existing plots or divided the commune's arable land into a completely new layout. This paper is concerned with the *marginal effects* of these repartitions, as distinct from the broader implications of the open fields for Russian agricultural productivity.

The literature on nineteenth-century Russian development typically assumes that repartitions were relatively frequent, all community members were required to participate, and that communal authorities re-allocated land rights without considering prior usage or investment decisions (for example, Gerschenkron, 1965). In this way, the possibility of future repartitions was thought to undermine incentives to maintain soil quality and invest in land improvements. However, archival and published accounts suggest several problems with this interpretation.¹⁹

First, the actual process of taking land from one household and passing it to another was not random. Repartitions were typically initiated with the communal assembly by self-interested peasants. Indeed, the practice typically **only** involved those households with reasons – demographic, non-agricultural specialization, or others – to adjust their land holdings. As a result, community-wide repartitions were relatively infrequent, and the majority of adjustments only involved a few plots and a small number of households. The process often became political, as it sometimes involved substantial bargaining and/or compensatory payments. Finally, manured or otherwise improved land was often entirely excluded from repartitions.

Repartitions and grain productivity

The archival and published accounts cast into doubt the narrow view of repartitions as a random expropriation of property rights. These do not amount to an empirical test. To investigate whether repartitions were adversely associated with agricultural productivity, this paper draws on a unique dataset on repartitions and economic conditions in Moscow province between 1858 and 1878.²⁰ Although this region was characterized by relatively poor soil and climate conditions for agriculture, communes practised repartitions in much the same way as elsewhere in central Russia.²¹ However, the relatively low land productivity had implications for why communities repartitioned their land (see below).

In 1864, legislation was passed to set up institutions known as the *zemstvo* at the district and provincial levels. These *zemstva* were given the right to assess and collect taxes to finance programmes for 'the local economic and welfare needs of each province and district'.²² These responsibilities led many *zemstva* to initiate statistical research programmes in their constituencies. A prominent one of these programmes occurred during the late 1870s, when V.I. Orlov and his colleagues carried out a massive investigation into the economic conditions of rural Moscow province. This programme took two forms: a survey of all villages in the province (*Sbornik*, 1877-82) and a study of land tenure and agricultural practices in peasant communities (Orlov, 1879). The village survey asked questions of the *skhod* regarding demographics, agricultural practices, assets, housing, financial obligations, and non-agricultural work (see Nafziger, 2006). The study of land

regions of the Russian Empire – e.g. the Ukrainian and Baltic provinces – household tenure in the open fields was relatively fixed and more closely resembled the English case. This difference was legislated into the Emancipation statutes, even as other aspects of rural society remained communal (such as local government and collective tax obligations). The focus here is on the repartitional type of communal land management, which predominated in the 'Great Russian' provinces surrounding Moscow.

¹⁹ This following is derived from several sources. Especially valuable are surveys of communal practices carried out by the Free Economic Society in the late 1870s. Local respondents to the survey answered numerous questions on how communes redistributed property rights. See Anfimov and Litvak (1983-91), Barykov et al. (1880), and the original returns in the Russian State Historical Archive (*fond* 91, *delo*, 2).

²⁰ This study contributes to the broader literature on the relationship between tenure security and agricultural productivity. For example, see Besley (1995) and Jacoby et al. (2002).

²¹ Out of the 5,636 peasant communes in Moscow province in 1905, only 2 held their land under household, as opposed to repartitional, tenure (*Statistika*, 1906, p.37). Thus, variation in land rights (and the possible level of expropriation risk) arose primarily from differences in the frequency and scale of repartitions, rather than from other aspects of communal cultivation.

²² This quote is from Clause 1 of the 'The Statute on *Zemstvo* Institutions,' in McKenzie (1982, p.31).

practices collected data on the prevalence and frequency of repartitions by communes between 1858 and 1878. According to Orlov, communal repartitions were ‘widely known’ for harming peasant agriculture, and he was investigating whether that was true (1879, p.133).

At the township level, Orlov reports the total number of communes providing information and the total number of repartitions that took place in these communities over the period. I divide one by the other to arrive at a measure of repartitions per commune in each township – *Repartitions*. On average, each commune experienced slightly more than two repartitions between 1858 and 1878. For 158 of the 165 townships in the province, I was able to match this to additional data from the village survey. The resulting dataset is summarized in table 1. Significantly, Orlov notes that these data on repartitions reflect observations of ‘*obshchie peredely*’ or general repartitions of the arable land of all three fields (ibid., p.135). These observations do not take into account adjustments that involved just a few households or a small number of plots. Thus, *Repartitions* describes those adjustments of property rights that possibly had the most dramatic impact on production incentives.

I evaluate whether repartitions were negatively associated with agricultural productivity by running yield regressions derived from a simple grain production function. From the *zemstvo* village survey data, I calculated winter (rye) and spring (oats) grain yields for the 1876-77 agricultural year. Controlling for labour and capital (i.e. livestock) inputs per unit of land, the inclusion of *Repartitions* describes one aspect of communal land practices. As repartitions may have only affected the perception of tenure security at higher frequencies, I also include the square of *Repartitions*. Finally, district-level dummy variables help control for unobservable differences in soil quality and other grain inputs.²³ The results of the specifications with and without district controls are presented in table 2.

The specifications presented in table 2 provide some suggestive evidence that the frequency of repartitions was negatively associated with grain yields. Although the regressions without district effects provide little indication of any correlation, specifications 2 and 4 do show a strong negative association. The joint effect of *Repartitions* and its square are negative at the sample means and relatively large given the low grain yields. The differences between the specifications with and without district effects suggest that local conditions mattered for grain yields. Within districts the frequency of repartitions did matter for explaining differences in yields across townships. However, given the discussion above regarding how repartitions actually took place, it is not clear that the negative relationship actually reflects uncertainty over property rights.

Towards a reinterpretation of communal land repartitions

Why did communes undertake repartitions? Accounts suggest that peasants turned to land adjustments within the commune when market transactions were either costly or prohibited. Before 1861, land markets existed but were restricted under serfdom (Dennison, 2004, pp.123-4). After Emancipation, land was allocated to communes rather than individual households. Market transactions – especially with outsiders – were regulated or prohibited entirely by accompanying legislation (Nafziger, 2006). Rental and sales markets did exist, but transactions between communal members were often formalized as small-scale repartitions (by formal re-arrangement of land), rather than market transactions. Whatever the reason (changes in household labour, new off-farm opportunities, etc.), households who wished to acquire or divest land were forced to rely on *institutional* adjustments.

Peasant communities, both before and after 1861, faced external tax and land obligations that were assigned to the commune as a whole. Shares of these collective payment obligations were typically tied to allotments of the communal land. In the Moscow region, these payments exceeded the net agricultural value of the land, because they were partially determined by the extent of off-farm income. Thus, many observers have argued, as Leroy-Beaulieu (1893, Vol. 1, p.522) did, that: ‘The distribution of the communal land is but another form of the distribution of the communal

²³ There were 13 districts in Moscow province.

taxes'. With households unable to adjust their share of obligations through land markets, changes in situations had to be dealt with through the commune.

To test whether this interpretation is valid, I turn again to the Moscow township dataset. Table 3 displays the results of reversing the analysis by putting *Repartitions* on the left-hand side and testing for the importance of different factors that potentially affected the frequency of repartitions. These include the fundamental force driving households to initiate repartitions (*PopChange*), variables that relate to the value of the land being redistributed (*LandAllot*, *PercentArable*, and *Obligations*), a measure of the difficulty of collective action (*HHsPerCommune*), and indicators of the level of factor market development (*SerfPercent*, *KmToMoscow*, *LandRentals*). These variables are defined and summarized in table 1. The particular variables chosen (and their exact forms) reflect the available data and the outcome of specification tests available in the complete paper.

The evidence in table 3 supports a more nuanced view of repartitions. Focusing on the specifications with district effects (2 and 4), higher obligation levels were associated with more frequent repartitions – thus, optimizing the distribution of land was more pressing when each unit of land carried a higher 'price'. More households per commune made it more difficult to organize these general repartitions, hence the negative coefficient on *HHsPerCommune*. The positive coefficient on *SerfPercent* – where higher values likely reflect areas with less developed markets – suggests that repartitions did act as institutional substitutes for market transactions. This is further confirmed by the positive relationship between *Repartitions* and other indicators of market underdevelopment, such as *KmsToMoscow* and *LandRentals*.

Conclusion

These results suggest that the negative relationship between the frequency of repartitions and grain productivity may have had little to do with uncertainty over property rights. Rather, areas with poorly developed factor markets or significant non-agricultural sources of income (and high obligation levels) were those with both frequent repartitions and low agricultural productivity. Thus, the standard interpretation of the commune's impact on Russian agricultural development needs to be reexamined. Repartitions were only one mechanism through which the land commune potentially influenced the path of Russian economic development. Ongoing research aims to uncover and explain other aspects of the institutional context for Russian development in the late nineteenth century.

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Table 1: Summary Statistics: Township-Level Data

Variables	Mean	SD	N
<i>Repartitions per commune, 1857-1876</i> [Repartitions]	2.17	0.77	158
<i>Communes per township</i> (Orlov data) [CommuneOrlov]	27.80	13.22	158
<i>Winter grain yields</i> (bushels/acre)	2.66	0.74	155
<i>Spring grain yields</i> (bushels/acre)	2.63	0.54	155
<i>Workers per acre</i> [Labor]	0.25	0.14	155
<i>Livestock per acre</i> [Livestock]	0.19	0.08	155
<i>Land allotment</i> (acres) [LandAllot]	21.31	5.57	158
<i>% arable</i> [PercentArable]	51.55	14.98	158
<i>Obligations per allotment acre</i> [Obligations]	1.29	0.37	158
<i>Population change</i> (abs. value) [PopChange]	32.14	14.23	158
<i>Households per commune</i> [HHsPerCommune]	45.39	22.27	158
<i>% serfs in 1857</i> [SerfPercent]	66.60	29.35	158
<i>Kilometers to Moscow</i> [KmsToMoscow]	76.89	34.94	158
<i>% allotment land rented</i> [LandRentals]	0.19	0.40	143

Note: *Repartitions* is the average number of general (*obshchie*) repartitions over the observed communes in a township between 1858 and 1878. The number of such communes documented by V.I. Orlov is denoted by *CommuneOrlov*. The grain yields are in bushels per cultivated acre of allotment (i.e. communal) land in 1876-77. *Labor* is the working-age population, and *Livestock* is the number of cattle and horses per acre of allotment land, also in 1876-77. *PopChange*, *PercentArable*, *SerfPercent*, and *LandRentals* are defined in percentage points. *LandAllot* is the number of allotment acres per household in 1876-77, while *PercentArable* is the percentage of allotment land that was arable. *Obligations* is the total payments (tax and land payments) due on one acre of allotment land in 1876-77. *PopChange* is the percent change in the township's population from 1857-58 to 1876-77. *HHsPerCommune* is the number of households per commune in 1876-77. *SerfPercent* is the population share of former serfs relative to former state peasants in 1876-77 (this excludes former "court" peasants). *KmsToMoscow* is measured from each township's name-sake village or administrative seat. *LandRentals* is the percentage of 1876-77 allotment land rented out or in over the period 1867-76 (summing land exchanged in all official transactions). **Sources:** Orlov (1879) and various volumes of *Sbornik* (1877-1879).

Table 2: Repartitions and Grain Productivity

	Winter Grain Yields		Spring Grain Yields	
	1	2	3	4
<i>Repartitions</i>	-0.044 (0.191)	-0.333* (1.807)	0.025 (0.224)	-0.199** (2.570)
<i>Repartitions</i> ²	-0.002 (0.073)	0.047 (1.525)	-0.014 (0.988)	0.027** (2.579)
<i>Labor</i> (ln)	0.785**	-0.178	0.624***	-0.036
<i>Working-age population</i>	(2.851)	(1.112)	(3.462)	(0.243)
<i>Livestock</i> (ln)	-0.031	0.386	-0.352	0.060
<i>Total head</i>	(0.102)	(1.743)	(1.628)	(0.393)
Observations	155	155	155	155
R ² -overall	0.21	0.57	0.18	0.54
District effects	No	Yes	No	Yes

Note: Absolute t-statistics, clustered at the district level, are in parentheses (* p<0.1, ** p<0.05, and *** p<0.01). Constant terms are not shown. Each township-level observation is weighted by the underlying number of settlements to improve efficiency. The variables are defined in the note accompanying Table 1. Three observations of crop-yield data were missing.

Table 3: The Determinants of Repartition Frequency

Dependent Variable: Repartitions Per Commune, 1858-1878				
	1	2	3	4
<i>LandAllot</i>	-0.022 (1.078)	0.007 (0.489)	-0.014 (0.657)	0.012 (0.896)
<i>PercentArable</i>	-0.014 (1.736)	-0.006 (1.557)	-0.012 (1.532)	-0.005 (1.144)
<i>Obligations</i>	0.179 (0.505)	0.496 (1.465)	0.347 (0.652)	0.784** (2.207)
<i>PopulationChange</i>	-0.004 (0.593)	0.001 (0.185)	-0.004 (0.661)	0.002 (0.347)
<i>HHsPerCommune</i>	-0.004 (1.777)	-0.007* (2.069)	-0.003 (1.103)	-0.005 (1.737)
<i>SerfPercent</i>	0.007 (1.644)	0.006** (2.313)	0.006 (1.491)	0.005* (1.870)
<i>KmsToMoscow</i>	0.005 (1.556)	0.008* (1.989)	0.003 (0.954)	0.007 (1.651)
<i>LandRentals</i>			-0.269* (1.858)	-0.137 (1.031)
Observations	158	158	143	143
R ² , overall	0.16	0.40	0.17	0.41
District effects	No	Yes	No	Yes

Note: Absolute t-statistics, clustered at the district level, are in parentheses (* p<0.1). Constant terms are not shown. The dependent and independent variables as defined in Table 1. Differences in sample sizes are due to missing observations on *LandRentals*. Each township-level observation is weighted by the underlying number of observed communes to improve efficiency.

Professional networks and the Egremont Estates, 1796-1805

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This paper considers the role of surveyors in the improvement of landed estates in Britain during the early decades of the nineteenth century. In particular, it examines the employment of the geologist William Smith (1769-1839) by the third Earl of Egremont (1751-1837) on his Yorkshire estates from 1803. This study is used to unravel professional networks and the transfer of knowledge between the Earl of Egremont's home estate at Petworth and his land in Yorkshire as well as connections with the Board of Agriculture and the Royal Society in London. The study examines debates regarding professional status and the nature of patronage in the developing field of geology. Finally, it considers the role and potential influence of acknowledged 'experts' in the improvement of absentee estates in Britain during this period.

William Smith and the Egremont Estate

William 'strata' Smith (1769-1839) was a self-taught land surveyor, mineralogist and drainage engineer from Oxfordshire, whose research produced the first true geological map of Britain in 1815.²⁴ Smith was one of a growing number of surveyors who were employed on enclosure and inland navigation projects from the late eighteenth century. Surveyors became increasingly professionalized during this period. This coincided with the professional and managerial revolution in law and medicine, and was characterized by increased autonomy and exclusive knowledge that made professionals indispensable to their employers.²⁵ One such employer was the renowned agricultural improver, George O'Brien Wyndham, third Earl of Egremont (1751-1837), who owned over 110,000 acres in Sussex, Somerset, Yorkshire, Cumberland and Ireland, with an estimated annual income of £100,000.²⁶ Over 30,000 acres of the estate were located near Petworth (Sussex), Egremont's primary residence and the central site from which the wider estate was managed at this time. While Egremont is known primarily for his experiments in livestock breeding and the construction of canals in Sussex, he did not neglect the more profitable parts of his wider estate, in particular his lands in Yorkshire, consisting of 24,733 acres in Wressle and Leconfield (East Riding), Catton and Seamer (North Riding), and Spofforth and Tadcaster (West Riding).²⁷

Egremont's Yorkshire estates were extensively reorganized by the London surveyor firm Kent, Claridge and Pearce from 1796. John Claridge completed a survey between 1796 and 1797 that revealed an under-rented and poorly organized 24,000-acre estate. Nevertheless, Claridge's diligent management and suggestions for improvement resulted in a doubling of rental value between 1796 and 1811, although this was due in part to a period of inflation. Despite being an 'absentee'

²⁴ S. Winchester, *The Map that Changed the World* (London, 2002). As Penelope Corfield argued, occupational pluralism was not uncommon, although a trend towards specialization can be observed in the professions during this period. P.J. Corfield, *Power and the Professions in Britain, 1700-1850* (London, 1995).

²⁵ F.M.L. Thompson, *Chartered Surveyors: The Growth of a Profession* (London, 1968), p.29; P. Brassley, 'The professionalisation of English agriculture', *Rural History* (2005) 16, 2, 249; D. Duman, 'Pathway to professionalism: the English bar in the eighteenth and nineteenth centuries', *Journal of Social History* 13 (1979), 615-627; S. Webster, 'Estate improvement and the professionalisation of land agents on the Egremont estates in Sussex and Yorkshire, 1770-1835', *Rural History* 18, 1 (2007), pp.1-24.

²⁶ The third Earl of Egremont was offered the post of President of the Board of Agriculture in 1798 and was described by the historian Mark Anthony Lower in 1865 as 'one of the fathers of modern English agriculture'. M.A. Lower, *The Worthies of Sussex* (London, 1865).

²⁷ The Yorkshire estate was situated mainly in the East Riding (54%), with less land in the North Riding (31%) and the West Riding (16%). The Yorkshire rental was £19,443 in 1803, and in 1809 the Spofforth rental for this estate was £3,232. (West Sussex Record Office, Petworth House Archives, hereafter W.S.R.O., P.H.A. 4111).

landlord, Egremont spent £26,000 between 1797 and 1812 on draining and fencing alone on this estate.²⁸

Networks of Patronage

It was in this context of increased expenditure in Yorkshire that William Smith was commissioned in 1803 to examine the potential for the extraction of coal at Spofforth.²⁹ While it is unclear how Smith received this commission, it is likely that the geologist was recommended to Egremont by one of his fellow members of the Board of Agriculture, Thomas Coke (1752-1842) of Holkham, or, more likely, Francis Russell, fifth Duke of Bedford (1765-1802). Coke had inspected Smith's Somerset drainage in 1800, commissioned work from him on his Norfolk estate, and had introduced him in 1801 to the Duke of Bedford who was undertaking extensive drainage and irrigation at his home estate at Woburn (Bedfordshire). Earlier still, in 1796, William Smith had been elected a member of the Royal Bath and West of England Society, of which both Bedford and Egremont were members.³⁰ The sudden death of Bedford in 1802 may have been another reason for this commission by Egremont as he tried to assist Smith after losing his primary supporter. Lord Egremont may also have read Smith's 'Prospectus', which was widely circulated from 1801.³¹ A further connection to Egremont may have been gained through Smith's engineering work in Sussex on the river Ouse, where he would certainly have come into contact with the agriculturalists John Ellman and Lord Sheffield (1741-1821), president of the Board of Agriculture from 1803 to 1806.³²

Alternatively, William Smith may have been recommended to Egremont by Sir Joseph Banks (1743-1820), the connection made through membership of the Royal Society and mutual interests in estate improvement and the development of sheep breeds. Sir Joseph Banks had visited the Woburn drainage improvements in 1798, and met the surveyor John Farey who was acting as agent for the Duke of Bedford. After working together at Woburn, and making two geological tours together, Farey promoted Smith's discoveries to Banks as President of the Royal Society in February 1802, demonstrating that the geologist was the first to document the sequential order of British rocks, and had discovered the means to identify individual strata within that sequence using fossils.³³ In June 1802, Smith exhibited his geological map (that was eventually published in 1815) at the Duke of Bedford's annual Woburn sheep-shearing fair, where Joseph Banks promoted the geologist's work.³⁴ Lord Egremont had been in correspondence with Joseph Banks since the 1790s regarding wool, the king's merinos, and his own admission into the Royal Society in 1797, and it is likely that he attended the annual fair at Woburn from the same year until its lapse in 1821. Smith continued to exhibit his maps at Woburn for a number of years in order to gain subscriptions for his geological publications, and commissions from those great 'improving' landowners and others for whom the Woburn, and later Holkham, sheep-shearing fairs were essential social gatherings for the agricultural world.

²⁸ H.A. Wyndham, *A Family History 1688-1837. The Wyndhams of Somerset, Sussex and Wiltshire* (London, 1950), pp.308, 33.

²⁹ Winchester describes correspondence between Egremont and Smith regarding the likelihood of coal being found on his estate at Spofforth. Winchester, *The Map*, p.199.

³⁰ Winchester, *The Map*, p.126.

³¹ J. Phillips (1844), *Memoirs of William Smith*. John Murray, London, p.36.

³² Skempton, A. (2002), *Biographical Dictionary of Civil engineers vol. 1: 1500-1830*, London, p.639; Boud, R.C. (1975), 'The Early Development of British Geological Maps' *Imago Mundi*, 27, p. 86; S. Farant (1978), John Ellman of Glynde in Sussex, *Agricultural History Review*, 26, pp.77-88; J. Cannon (2004) Holroyd, John Baker, first earl of Sheffield (1741-1821), *Oxford Dictionary of National Biography*, Oxford University Press.

³³ H.S. Torrens (2004), Smith, William (1769-1839), *Oxford Dictionary of National Biography*, Oxford University Press; H.S. Torrens (1994), 'Patronage and problems: Banks and the earth sciences', in *Sir Joseph Banks: A Global Perspective* (eds. R.E.R. Banks and others), Royal Botanic Gardens, Kew: London, 1994, pp.49-75; H.S. Torrens (2004), Farey, John (1766-1826), *Oxford Dictionary of National Biography*, Oxford University Press.

³⁴ Anon, 'Agriculture' [report on the Woburn sheep-shearing], *Agricultural Magazine* (1802), 6, p.466.

Despite this uncertainty whether the connection with Smith was made through the Board of Agriculture or the Royal Society, it is clear that the overlapping agricultural and scientific circles of Bath, Woburn and London provided the third Earl with access to information regarding this geologist.

The Spofforth Coal Surveys

The search for coal by Yorkshire landowners had been recorded as early as the 1630s in the East Riding, but, despite a number of searches later in the eighteenth century, no mines were opened.³⁵ In contrast, the West Riding *General View of the Agriculture* reported in 1793 that ‘There are numerous mines of coal, lime, ironstone and lead, and some copper, in this district, which have been wrought for ages past ...’.³⁶ Lord Egremont’s estate at Spofforth, near to the coalmines of Leeds and Bradford (although not so proximate as to be in competition with them), was considered a likely place for coal. However, it is surprising that Egremont employed Smith to examine this estate after a pessimistic survey carried out by one William Walker, a mineral surveyor from Whitehaven, in September 1798. Walker reported that the prospect of finding coal was ‘very unfavourable’, and could not justify a trial in more than one place. He argued that if a trial was carried out, ‘the seam of coal if any will be so small and lay [*sic*] at such a depth as not to be an object of attention or render the working [of] it profitable’.³⁷ Nevertheless, perhaps in this report an optimist might read some uncertainty, and be persuaded a few years later by William Smith’s promoters (particularly Banks and Bedford) to undertake an intensive coal trial.

William Smith wrote to Lord Egremont regarding his journey to Yorkshire in February 1803, and the surveyor was furnished with introductory letters for his visit from the Yorkshire agent John Claridge.³⁸ By April, Smith had written an initial report on the ‘great success’ of his trials. His research had begun with a map of Yorkshire and a slow journey northwards ‘in order to trace the connecting line between this coal and that which is now working in other parts of the country’. Spofforth was apparently located ‘within the general range of coal strata’, and the surveyor had found encouraging ‘symptoms of coal’ in the area, including ‘surface soil and stones’, ‘ancient pottery’, and the overlying geology characteristic of coal areas (initially examined by sinking wells). As trials had so far produced a thin seam of coal and some iron ore near the surface, Smith recommended the use of a steam engine to remove water from deeper wells; thereby promising both economy in the trials, and prospective wealth due to the high price of coal in the area.³⁹

A month later, Smith produced a comprehensive report on the ‘discovery of coals at Spofforth’, although the mineral layers remained in an irregular and unprofitable position; which only spurred Smith on to further research. The report was accompanied by a diagram of the strata (below), which illustrates the geologist’s competence. However, the six thin layers (of which only the first and fourth layers were measured) shown in the diagram are suggestive of a rather desperate search, by both an indigent surveyor, and an optimistic and wealthy landowner. Smith tempted Egremont with ‘a conviction that coals will be found in sufficient quantity ... [and quality] than any that has yet been discovered in that part of Yorkshire’.

³⁵ B. English (2000), *The Great Landowners of East Yorkshire, 1530-1910*. 2nd edition. Hull Academic Press, Goole, p.197.

³⁶ R. Brown, G. Rennie and J. Shirreff (1793) *General view of the agriculture of the West Riding of Yorkshire*. Board of Agriculture: London.

³⁷ W.S.R.O., P.H.A. D22/18. *Mr William Walker’s report on the prospect of getting coals in Spofforth park, or the neighbourhood*, 28 Sep. 1798.

³⁸ W.S.R.O., P.H.A. D22/18: Smith to Egremont, 3 February 1803; D22/15: Claridge to Egremont, 12 February 1803. Correspondence between Claridge and Smith (1803 and 1805) is also located at the University of Oxford Natural History Museum: William Smith Archive/Boxes 1-2, 6 passim.

³⁹ W.S.R.O., P.H.A. D22/18. *A report on the probability of finding coal at Spofforth in Yorkshire by William Smith*, April 1803.

to assess the viability of the trials.⁴⁴ In a later letter, Greville stated that he was ‘sorry to think that there is no chance of a good seam of working coal at Spofforth and that the perseverance in trial has been greater than I should have encouraged after the first trial’. The prospect of the great trial was ‘desperate’, and mining (even for iron ore) in the faulted area would prove unprofitable.⁴⁵ Greville stated that William Smith, whom he did not know, was well acquainted ‘with the strata of Yorkshire’, but that coal does not always occur where it might be expected. While the surviving letter is incomplete, it is likely that Greville recommended that Egremont end the trials.

However, by November 1804, and regardless of the fact that the cost of the experiment had exceeded £1,000 with very little to show for it, both Smith and Claridge remained sanguine, arguing that the boring apparatus should be moved to another estate belonging to the Earl if they did not succeed at Spofforth.⁴⁶ Despite this, it is likely that the mineral experiment was ended later this year, as there is no further remaining correspondence between Egremont, Smith and Claridge.

The Spofforth experiment may well have benefited William Smith more than it did Lord Egremont. The geologist charged two guineas a day plus expenses for mineral surveying, and made at least eight visits to Yorkshire from London.⁴⁷ More importantly, as Smith’s nephew John Phillips described, surveying provided the means and opportunity (at the site and travelling to it) to observe geological strata, which enhanced Smith’s knowledge, and provided data for the geological map that was to make him famous.⁴⁸ However, Egremont also benefited from Smith’s ‘ideas about draining the lands by the river’ at Spofforth, and a promised geological map of the estate that may have been of value to estate improvements more generally.⁴⁹

Furthermore, the Spofforth survey mobilized current and developing ideas about geology to prove beyond doubt that there was no profitable coal on this estate, a step beyond the 1798 survey that only considered that it was unlikely. Although Smith did not find profitable coal deposits at Spofforth, his reputation for finding coal in unlikely places was secured by the establishment of Hetton Colliery (Durham) in the 1820s.⁵⁰ Smith’s persistence and his willingness to challenge scientific opinion established his reputation as one of the founders of modern geology.

Professional status and reputation

Nevertheless, in his correspondence with the Earl of Egremont in 1804, the mineralogist Charles Greville stated that he did not know William Smith. This insignificant comment goes some way to revealing the contested status of practical surveyors in this genteel science. While Smith was elected a Fellow of the Royal Society with the support of its president Sir Joseph Banks, both Smith and John Farey were excluded from the formation of the Geological Society of London in 1807, which Farey referred to in 1822 as the ‘Anti-Smithian’. Smith, the bankrupt son of an Oxfordshire blacksmith was not welcomed into such society. Even Farey’s son, an engineer, was blackballed from the society, where trustworthiness was characterized by the disinterested gentleman.⁵¹ Charles Hatchett, himself merely a son of a coach-maker, fulfilled the role of amateur expert, in contrast to the professional mineralogist William Smith. To complicate matters further, Smith did not view himself as a ‘practical’ surveyor, but as a scientist. Phillips’ memoir of Smith dismissed the guidance

⁴⁴ This is probably Thomas Dodd, a land surveyor working in the North Riding of Yorkshire at this time. S. Bendall, ed. *Dictionary of land surveyors and local map makers of Britain 1530-1850*, 2nd edn. (London, 1997), vol. 2, p.146.

⁴⁵ W.S.R.O., P.H.A. D22/18: CF Greville to Egremont, 10 July 1804 and n.d. [July 1804].

⁴⁶ W.S.R.O., P.H.A. D22/15: Claridge to Egremont, 6 Nov 1804.

⁴⁷ H.S. Torrens (2004), Smith, William (1769-1839), *Oxford Dictionary of National Biography*, Oxford University Press; W.S.R.O., P.H.A. D22/15, D22/18.

⁴⁸ J. Phillips (1844), *Memoirs*, p.55.

⁴⁹ W.S.R.O., P.H.A. D22/18: Smith to Egremont, 6 April 1803 and D22/15: Claridge to Egremont, 17 April 1803; D22/18: *Report on the discovery of coals*, May 1803. Smith published a geological map of Yorkshire in 1821. Skempton, *Biographical Dictionary*, p.639.

⁵⁰ Boud, R.C. (1975), ‘The Early Development of British Geological Maps’.

⁵¹ H.S. Torrens (1994), ‘Patronage and problems’, pp.49-75; A. Ophir and S. Shapin, ‘The place of knowledge: a methodological survey’ in *Science in Context* (1991), 4, pp.3-21.

of so-called 'practical men' in favour of 'positive facts and reasonable arguments advanced by 'men of science'.⁵²

The Royal Society in London played a key role in distinguishing between practitioner and scientist, functioning as a 'clearing-house' for natural knowledge and a review body for scientific reports during the eighteenth century.⁵³ In this paper, the Society, and in particular its Joseph Banks (PRS 1778-1820) provided a source for recommended expertise (both amateur and professional), as well as offering a means of introduction for those requiring, and those dispensing (if not actually selling) scientific knowledge. Key figures, such as Banks, Egremont and Bedford provided links to the Board of Agriculture, and to provincial societies such as the Bath and West society. These networks tapped into local estates including Petworth and Woburn, which then influenced the management of absentee estates, and even influenced estates nationally through the publications of Arthur Young, among others.

Absentee Estates and the Role of Experts

From the late eighteenth century, the Egremont estate was managed from Petworth, where contemporary authors recorded the Earl's passion for agricultural improvement. However, attempts at improvement can be seen more widely on the estates in Yorkshire, Cumberland, Ireland and Australia, where 'professional' estate managers, mineral and land surveyors were employed to improve estate income, and to a lesser extent, improve conditions for tenants. These men brought with them ideas, technology and expertise, and abstracted capital (often in considerable amounts) from their employer for land drainage, canal schemes, estate rationalization, mineral speculation and many other activities. Such experts had a significant role in the transfer of ideas from recognized sites of excellence to more dispersed estates. Interest in these 'absentee' estates also brought transfers of estate workers, as well as goods including seeds, stud animals, and in the case of William Smith, geological samples. Due to a greater level of autonomy, the role of improvement professionals at these external sites was arguably more significant than that experienced on the more famous home estates. An examination of so-called 'absentee' estates (both in Britain and the colonies) would help to balance accounts of estate management which have hitherto concentrated on the 'home' estate as the primary site of agricultural improvement.

⁵² J. Phillips (1844), *Memoirs*, p.67.

⁵³ Hall, M.B. 1965. Oldenburg and the Art of Scientific Communication. *British Journal for the History of Science* 2, pp.277-90; Lux, D.S. and Cook, H.J. 1998. Closed Circles or Open Networks?: Communicating at a distance during the Scientific Revolution. *History of Science*, 36 (2) pp.112, 179-211; Rusnock, A. 1999. Correspondence Networks and the Royal Society, 1700-1750. *British Journal of the History of Science* 32:2, No 113, pp.155-69.

Peasant reproduction: mobility, household formation and socioeconomic status in early modern Sweden

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Studies of mobility and household formation in pre-industrial Europe have revealed a very complex pattern. We are now well aware of the fact that Europe did not witness a linear development from large, complex and stable households to small, nuclear and mobile ones. Traditional explanations in terms of 'culture' or 'mentalities' have been called into question. In its place, more recent research has stressed the impact of state or manorial regulations and availability of land.⁵⁴

Discussions are often about differences between regions (Eastern vs. Western Europe, Midland vs. East Anglia, Eastern vs. Western Sweden). Here, I will consider differences within a single area, the Mid-Swedish parish of Bjorskog. The guiding idea is that such variations will highlight the impact of socio-economic differences. In this way I wish to contribute to the discussion of a more diversified understanding of peasant mobility and household patterns.⁵⁵

Questions of peasant mobility, household formation and the family-land bond all relate to the same issue: the reproduction of the peasant household, or the replacement of households on a specific farm. This replacement may happen gradually, following the life courses of births, deaths, marriages, and individual migration, or completely, through the migration of the entire household.⁵⁶ The nature of replacement is dependent on demography, but also, as this study will show, on the socio-economic conditions of the reproduction.

If you study tax records of Bjorskog over time, you will find that the number of farms increased from the middle of the seventeenth century up until 1780 (figure 1). This is expanded reproduction in the sense that according to Harriet Friedmann characterizes simple commodity production, i.e. expansion of units.⁵⁷ The major reason for such expansion is demographic pressure, and accordingly, the population of Bjorskog grew from 907 persons in 1643 to around 1,300 in the second half of the eighteenth century.⁵⁸ Thereafter, peasant reproduction changed. Now it expanded according to the principles of capitalism, i.e. units became larger in terms of landholding, as land was concentrated to fewer households. The population stagnated and in some decades it even declined, despite the fact that numbers of birth exceeded numbers of death. The explanation, noted already by the vicar, was emigration. Probably Bjorskog experienced what Charles Wetherell and Andrejs

⁵⁴ E.g. David I. Kertzer & Caroline Brettell, 'Advances in Italian and Iberian Family History', *Journal of Family History*, vol. 12 (1987); Michel Oris, 'The History of Migration as a Chapter in the History of the European Rural Family: An Overview', *The History of the Family*, vol. 8 (2003); Zvi Razi, 'The Myth of the Immutable English Family', *Past and Present*, no. 140 (1993); Mikolaj Szoltysek & Konrad Rzemieniecki, 'Between 'Traditional' Collectivity and 'Modern' Individuality: An Atomistic Perspective on Family and Household astride the Hajnal Line (Upper Silesia and Great Poland at the End of the 18th Century)', *Historical Social Research*, vol. 30 (2005); Charles Wetherall & Andrejs Plakans, 'Intergenerational Transfers of Headships over the Life Course in an Eastern European Peasant Community', *The History of The Family*, vol. 3 (1998); Jane Whittle, 'Individualism and the Family-Land Bond: A Reassessment of Land Transfer Patterns among the English Peasantry c. 1270-1580', *Past and Present*, no. 160 (1998).

⁵⁵ Cf. Kertzer & Brettell (1987), p.92.

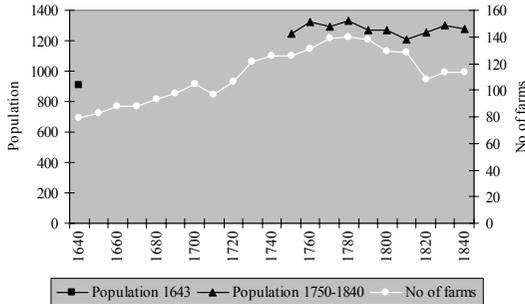
⁵⁶ Jan Lindgren, *Utsugning och utskrivning. Produktion och Reproduktion i Bygdeå 1620-1640*. (Uppsala, 1980), p.53.

⁵⁷ Cf. Harriet Friedmann, 'Simple Commodity Production and Wage Labour in the American Plains', *Journal of Peasant Studies*, vol. 6 (1978), p.88.

⁵⁸ The population of 1643 has been calculated by Nils and Inga Friber, Nils Friberg & Inga Friberg, *Sveriges äldsta fullständiga husförhörslängd* (Stockholm, 1971), p.14. Later figures are from the national population statistics collected by the local vicar.

Plakans found in nineteenth century Latvia: people left the parish in response to low odds of acquiring a farm.⁵⁹

Figure 1: Population size and numbers of farms. Bjorskog 1640-1840



This development is reflected in household composition. As Peter Laslett noted, complex households may be the result of the life cycle or, more precisely, of the gradual renewal of households.⁶⁰ This is true also for Bjorskog. Using catechetical examinations registers, I have calculated the composition and size of five cohorts, consisting of peasants holding land in Bjorskog in 1643, 1688, 1737, 1775 and 1814. Together, the sample consists of 487 households (table 1). Mean household size falls considerably with time. So does the number of complex households, particularly multiple families. However, in 1814 both these trends are reversed.

Table 1: Composition and size of peasant households. Bjorskog 1643-1814

	1646	1688	1737	1775	1814
No. of households	74	89	99	121	104
Mean size	8.9	7.1	5.8	5.3	5.7
% solitaries	-	1	-	-	1
% no family	-	-	-	-	1
% simple	50	53	61	69	54
% extended	14	21	22	19	26
% multiple	36	25	17	12	18
% households with servants	80	71	58	53	54

Household types following Laslett (1972), p.31.

Table 1 also tells us that the decreased importance of complex families did not imply that servants were substituted for family labour. Instead, it suggests another relationship: as households got more numerous, they also got smaller and more of them were simple.

What, then, decides the increase or decrease in number of households? Mikolaj Szoltysek and Konrad Rzemieniecki have stressed the importance of (a) regulation on farm partitioning, and (b) the economic situation of the individual households.⁶¹

In seventeenth century Sweden, the right to divide a farm was restricted for the sake of keeping its rent-paying ability intact. In the eighteenth century, as productivity rose and more stress

⁵⁹ Wetherall & Plakans (1998), p.341.

⁶⁰ Peter Laslett, 'Introduction: The History of the Family', in P. Laslett & R. Walls (eds.), *Household and Family in Past Time* (Cambridge, 1972), p.32.

⁶¹ Szoltysek & Rzemieniecki (2005), pp.135-6.

was put on population growth, these regulations were relaxed. The change may be seen in the cohorts of 1737 and 1775, when almost a fifth of all peasant households – compared to 4 per cent in 1688 and only 1 out of 74 in 1643 – lived on ‘new’ farms, i.e. units resulting from farm division. Since expansion of field land did not keep up with the expansion of farms, this increase was probably due more to the new rules than to better economic opportunities. Accordingly, most households on ‘new’ farms belonged to the poorer half of the parish (31 out of 39 in 1737 and 1775).⁶²

The increase in neo-locality meant a decrease in gradual replacements of households and hence a smaller number of multiple family households. First, it was easier for newly established families to get a farm of their own. Second, since more peasants were able to establish their own households, a lower proportion of households included retired parents.

The reversed trend in 1814 reflects, on the other hand, an increased importance of gradual replacements on farms, due to short supply of land resulting from population pressure and a more capitalistic land market.

In addition to buying and leasing, a young couple could gain land in return for supporting the old, retired heads (usually their parents). As land became more expensive, such gradual replacement became more important. This is seen in household composition. In the later years, almost all multiple families were extended upwards, i.e. they included the parents of the heads. By contrast, at the beginning of the period under study, it was rather common that married children lived with their parents a few years before they moved to a new farm.

One may also see a shift in the economic status of multiple family households. Tithel listings and land tax registers (for the cohort of 1814) suggest that while most multiple families at the beginning were rich, the majority of such households at the end of the period were poor. This supports the idea that many complex families were the result of the difficulties of acquiring land.

In nineteenth century Latvia, population pressure and a more capitalistic environment was accompanied by a weakening of the family-land bond.⁶³ This was not the case in Björskog. Using poll tax registers and tithe listings, I have studied headship transfers between 1640 and 1820. A ‘head’ is defined as the person who – in the eyes of the authorities – is responsible for cultivating the farm, and hence for paying rent, i.e. the person listed in the tax rolls. A ‘headship transfer’ is defined as the substitution of one person for another person in the tax records. The relationships between heads have been established by the method of family reconstitution. Table 2 shows the result.

Table 2: *Headship transfers in Björskog 1640-1820*

<i>Time period</i>	<i>No of transfers</i>	% within family
1640-1679	291	45
1680-1719	390	49
1720-1759	416	44
1760-1799	374	57
1800-1820	200	76
Total	1671	51

‘Family’ is defined as the immediate family, i.e. land is obtained from parents, children, siblings, or husbands/wives.

Whereas headship transfers within the family amounted to slightly less than half of all transfers in the seventeenth and first half of the eighteenth century, this proportion rose to three quarters in the early 1800s. To some extent, this rise may be the result of better documentation. But due to the narrow definition of ‘family’ (as the immediate family), it should only account for a small part. Moreover, a stronger family-land bond is in line with the increased importance of gradual replacement in the end of the period. Gradual replacement on farms is not identical with family continuity, but in most cases they coincide.

⁶² Based on tithe registers.

⁶³ Wetherall & Plakans (1998), p.342-3.

That this is a real change is further strengthened by the fact that the proportion of peasants born on the farm they possess increased from about a fourth in the late seventeenth century to a third in the early nineteenth century (table 3).

Table 3: *Places of birth: male and female peasants in Björskog 1688-1817*

	1688	1737	1775	1814
No of males	83	90	115	100
% born on the farm	29	29	48	42
% born in the parish	34	17	16	34
% born in another parish	37	23	24	20
% unknown	-	31	13	4
No of females	88	98	115	96
% born on the farm	13	12	17	26
% born in the parish	47	32	43	42
% born in another parish	40	27	33	29
% unknown	1	30	8	3

That greater difficulties in acquiring land, which led to a greater tendency to keep land in the family, has also been found by Jane Whittle in sixteenth century Norfolk.⁶⁴ Here, peasants had strong rights over their land, as they did in Sweden around 1800. By contrast, Latvian peasants had very limited rights, and landlords had great influence on the choice of new tenants.⁶⁵ This difference in terms of tenure thus explains the difference in land transfers.

According to table 3, mobility rates among peasants in Björskog decreased with time. If the entire population of the parish is considered, another picture emerges. ‘Peasants’ are here defined by their possession of taxed units (*hemman*). Smallholders on other ‘non-taxed’ units, cottagers, and day labourers, are excluded by the definition. Our knowledge of these groups is much more limited, but in general, they had smaller households and seem to have been more mobile than landed peasants.⁶⁶ Because of population growth and land concentration, this group expanded considerably in the late 1700s and early 1800s. Hence, as a whole, mobility rates probably increased. Besides, the difference between landed peasants and other groups became more accentuated.

Table 3 also reveals that male peasants more often than women stayed on the farm where they were born. The reason is the inheritance system, which favoured men; daughters inherited half as much as sons. In Björskog, 33 per cent of all family transfers were to sons, while only 15 per cent were to daughters and sons-in-law.

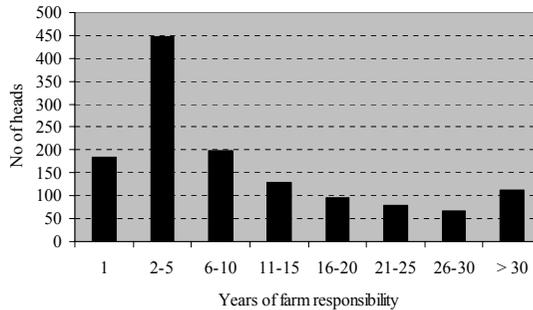
As a whole, the peasantry of Björskog was far from immobile. On the basis of poll tax registers and title listings, the length of time that a peasant head was responsible for a farm – again, in the eyes of the authorities – has been calculated. On average, in the seventeenth and eighteenth centuries this was for 10.8 years. However, as figure 2 illustrates, variations were great. While almost half of the peasants remained responsible for a farm for only five years or less, a fifth stayed for more than 20 years. These proportions are identical to the ones found by Magnus Perlestam in the parish of Ramkvilla in southern Sweden, using the same method and studying the same time period. In Ramkvilla mean value was 12-13 years.⁶⁷

⁶⁴ Whittle 1998, p.41.

⁶⁵ Wetherall & Plakans (1998), pp.346-7.

⁶⁶ Martin Dribe, ‘Migration of Rural Families in 19th Century Southern Sweden. A Longitudinal Analysis of Local Migration Patterns, *The History of the Family*, vol. 8 (2003), pp.259-60; Beatrice Moring, ‘Nordic Family Patterns and the North-West European Household System, *Continuity and Change*, vol. 18 (2003), pp.90-4; Magnus Perlestam, *Den rofaste bonden – myt eller verklighet? Brukaransvar i Ramkvilla socken 1620-1820* (Lund, 1998), p.229.

⁶⁷ Perlestam (1998), pp.127-8, 166.

Figure 2: *Length of farm responsibility: peasants taking possession of land in Bjorskog 1640-1779*

Apart from the turbulent period around 1700, characterized by bad harvests, plague and the Great Northern War, length of responsibility was fairly stable over time. Instead, differences were between subgroups within the peasantry (table 4).

The most striking difference is according to gender. As a rule, farm heads were male, and most female heads were widows. On average, a male headship lasted four times longer than a female. Perlestam, who termed female headship an 'interregnum' between males – a transitional stage in the gradual replacement – found a mean length of 4 years in Ramkville.⁶⁸ In Bjorskog, mean value was 3.3 years. If we however include their time as 'co-heads', i.e. as wives of heads, women surpass men with a mean value of 13.7 years.

Table 4: *Length of farm responsibility: peasants taking possession of land in Bjorskog 1640-1779*

	No of heads	Mean length
<i>Time of entry</i>		
1640-1679	293	11.2
1680-1719	389	9.8
1720-1779	631	11.3
<i>Type of tenure</i>		
Freeholders	647	14.0
Tenants	363	10.2
Subtenants*	303	4.7
<i>Land transferred</i>		
Within family	637	13.8
Outside family	676	8.0
<i>Gender</i>		
Male heads	1139	12.0
Female heads	174	3.3
<i>Total</i>	<i>1313</i>	<i>10,8</i>

* This group includes sharecroppers and peasants leasing free-holdings or farms designated to state officials.

Variations are also evident when it comes to type of tenure and land transfer. To some extent, these differences are interconnected, since most free-holdings (75 per cent) were transferred within the family, compared to one half among tenants and only a tenth among subtenants and sharecroppers. However, differences remain when these variables are separated.

⁶⁸ Perlestam (1998), p.231.

The difference between tenants and freeholders was also observed in Ramkvilla, but Perlestam assigned this to differences in wealth (tenants were generally poorer).⁶⁹ There were differences according to wealth in Bjorskog too, though these were rather small. More noticeable is the group of subtenants and sharecroppers – not found in the study of Ramkvilla. Their bond to the land was very loose; many of them leased a farm for a year or two, after which they left the parish. Nearly three quarters of them stayed for five years or less. Subtenant families were almost never multiple, and their households were, as a rule, smaller than freeholders and tenant households.

Subtenants and sharecroppers were most common on non-peasant land. When they turned up on land owned by other peasants, this was usually because the normal, gradual replacement of the household for one reason or another temporarily was broken (for example, by the death or illness of a parent). Rents still had to be paid, and there were enough people who, lacking a farm of their own, were willing to fill in. In the early nineteenth century however, most such farms were – despite the great expansion of landless households – leased out to already established peasants, who cultivated the land in addition to their own.

From the leaseholders' point of view, this was a way of accumulating land. As the group of proletarians grew, rich peasant became less dependent on household labour and could buy required labour instead. Hence, the difference in household size towards poorer peasants decreased (although rich households were as a rule still larger). The nature of peasant reproduction had changed.

⁶⁹ Perlestam (1998), p.129.

Risk and return effects of collusive arrangements: the Rhenish-Westphalian Coal Syndicate, 1893-1913

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In this paper, we present preliminary results from a project (funded by the Fritz Thyssen Stiftung) on the Rhenish-Westphalian Coal Syndicate (*Rheinisch-Westfälisches Kohlsyndikat, RWKS*), a collusive arrangement founded in 1893 by the mining companies of Germany's most important industrial region, the *Ruhr* district. The purpose of the project is the examination of the risk and return effects of the cartel. Therefore, we make use of the information content of prices and evaluate the stock market reaction to the foundation of the cartel and two major revisions of its contracts by event study methodology. The results of these studies are checked by an analysis of accounting data.

The RWKS

Among the numerous collusive arrangements that were set up in Imperial Germany, the *RWKS* is referred to as one of the most enduring and powerful ones. From its foundation on 9 February 1893, it existed as an exclusively private organization up to the First World War. During this time span, it controlled up to 50 per cent of the output of one of the most dynamic industries of Imperial Germany. Its officially stated aim was the stabilization of coal prices at a 'sufficient' but explicitly not 'exaggerated' level. More stable output and higher and more stable profits were also aimed at but regarded as by-products of price stabilization.

The *RWKS* was a price- and quota-setting cartel. Furthermore, to its members, the organization worked as a common sales agency that monopolized the distribution of their products. Production was controlled by a dynamic quota regime that allowed for changes in members' shares in the total output of the organization. Prices were differentiated with regard to the location where sales were conducted. In regions where transportation costs inhibited competition from outsiders, prices were set annually. Elsewhere, the *RWKS* sold its products at competitive prices. Non-compliance with the organization's rules was strictly sanctioned.

The original treaty of the *RWKS* was revised twice. The first revision was negotiated during the first half of 1895 and came into effect on 1 January 1896. Its aim was the limitation of a privilege that allowed companies to increase their cartel quota by sinking a new production shaft and that the members of the organization had used excessively. With the second revision of the original treaty, negotiated throughout 1903 and coming into effect on 1 January 1904, the vertically integrated iron and steel producers from the *Ruhr* district joined the cartel. Up to then, by boosting their coal output they had increasingly become the most powerful outsiders in the region that the *RWKS* authorities regarded as non-competitive.

Despite its impressive market share, its supposedly tight organization, and a significant stabilization of prices and revenues after the cartel formation, theoretical considerations as well as empirical observations make it seem unlikely that the *RWKS* was able to effectively pursue its officially stated aims. Firstly, the mining industry at the *Ruhr* appears to be a textbook example of an industry that is inappropriate for joint profit maximization: The number of cartel members was large, they were unequal in size, and their cost structures were heterogeneous. Moreover, coal mining was a growing industry and the *RWKS* faced intensifying outsider competition even in formerly non-competitive areas. Secondly, the theoretical literature on price stabilization cartels, while acknowledging that they can diminish price and profit risk, is sceptical about the merits of this type of arrangement. In general, it is concluded that even if the members of a stabilization cartel benefited from diminished profit risk, these benefits would be more than offset by a decline in profitability. Thirdly, the institutional framework of the *RWKS* produced tensions within the organization. During the valid time of the first two cartel contracts, the design of the quota regime favoured growing firms over those unwilling and/or unable to expand output. After 1904, vertically integrated steel and iron

companies became privileged in comparison to those companies that were only engaged in coal mining. The coal they self-used to run their operations remained outside of the cartel's control.

State of Research, Methodology, and Data

The risk and return effects of the *RWKS* have only recently become subject to econometric analysis. In two event studies, one with monthly and one with daily data, Bittner (2002, 2005) examines six participating mines and the first cartel contract. His findings indicate that from the viewpoint of contemporary investors the foundation of the cartel was of moderate importance for the profitability of the participating mining companies at best. Moreover, using monthly data, Bittner (2002) shows that there were no changes in systematic risk following the foundation of the cartel. This project seeks to follow up Bittner's analysis. Firstly, we intend to reproduce his findings on the first contract by looking at a larger sample of companies and employing a slightly modified econometric model. Furthermore, we aim to add a medium- and long-run perspective to Bittner's analysis. Therefore, we will also perform event studies on the two following cartel contracts that until now have been neglected. In addition, we will augment this analysis by a look at accounting figures over a time span of 34 years.

The basis of our event studies is a market model that controls for autoregressive conditional heteroscedasticity (ARCH). Moreover, it is augmented by an impulse and an interaction dummy variable to model the return and risk effects of the *RWKS*:

$$R_{it} = \beta_{1i} + \beta_{2i} R_{Mt} + \beta_{3i} D_{RND} + \beta_{4i} R_{Mt} D_{RSK} + \varepsilon_i$$

where R_{it} is the return R of company i at time t , β_{1i} is a company specific constant, β_{2i} is the covariance of the companies' returns with that of a market portfolio (R_M), and ε_i is a company specific error term with an expected value of zero and a variance that follows an ARCH(1) process. D_{RND} is a dummy variable that is equal to one on seven days with the supposed event date at the centre and zero otherwise. D_{RSK} is another dummy that is zero before the seven-day event window defined by D_{RND} and set to unity afterwards.

The first of the two dichotomous variables measures the return effects. A positive (negative) and significant coefficient implies that the investors at the stock market expected a rise (fall) in profitability due to newly emitted information. D_{RSK} models discrete changes in the covariance between company returns and those of the market portfolio. Using the terminology of the Capital Asset Pricing Model (CAPM), β_{2i} can be seen as representing the systematic, market related risk of company i . Thus, a positive (negative) and significant coefficient D_{RSK} implies that the systematic risk of the company under investigation has risen (declined) due to the emission of new information. Our exclusive focus on changes in systematic risk is justified by the fact that this was the only risk component that the *RWKS* was able to influence. The other component of overall risk, idiosyncratic risk, was beyond its reach, as it did not intervene in the internal businesses of its members.

For each of the three contracts, we estimate the model for individual companies and a period of around 600 trading days with the date, at which the respective contract was formally accepted (9 February 1893, 23 July 1895, and 29 December 1903), roughly at the centre. We start with the impulse dummy set to one at days 103 to 97 before the formal acceptance of the respective contract and to zero otherwise as well as the interaction dummy set to one from 103 days before that date onwards and zero otherwise. The joint significance of the two dummy variables is assessed by a Wald-Test. Thereafter, we repeat this procedure 110 times, each time shifting both the impulse and the interaction dummy one trading day further on. Thus, for each company and contract we end up with 222 coefficient values and 111 p -values from the Wald-Tests, representing a period covering 100 trading days before the event, the event itself and 10 trading days after it. By choosing this rather long period, we make sure to capture the important stages of the – well-documented – negotiation processes as well as possibly retarded effects.

In a next step, we calculate the cross-sectional means of the coefficient series and aggregate the p -values of the individual companies using the method of Fisher (1932). The result of the latter

exercise is a χ^2 -distributed test statistic with $2N$ degrees of freedom (where N is the number of units in the cross section). Using this newly constructed series, we can then by looking at its maxima determine detect structural breaks in risk and/or returns. For the date when such a maxima is reached, we count the number of significant coefficients and check their signs to completely assess the movement of the market.

The ratios used in the analysis of the accounting data are firstly calculated at the company level and then aggregated. For one, we calculate profitability ratios. Furthermore, we also consider ratios that in empirical insolvency studies have been found useful to discriminate between surviving and failing companies. We decided to use six ratios: two of them illuminate profitability (cash flow return on investment, return on equity), two shed light on liquidity (current ratio, working capital to total assets), and the remaining two cover financial and assets positions (equity to fixed assets, equity to total assets). It is assumed *a priori* that each of the ratios should be lower for failing than for non-failing firms. Thus, their analysis over time and at an aggregated level allows statements about if, and to what extent, the examined companies were better or worse off after the formation of the cartel. We perform a Time-Series Factor Analysis (TSFA) in order to identify unobservable common patterns in the individual movements of the ratios and, thereby, reduce the amount of data to be considered (basically, the procedure is a standard factor analysis with time-series in first differences to ensure stationarity of the data; see Gilbert & Meijer 2005). The estimates of these patterns, the so-called factor scores, are then plotted over time and made subject to further examination (the scores are dimensionless and have to be interpreted like indices).

Our dataset covers information on all 22 joint-stock mining companies that were members of the cartel between 1893 and 1913. Annual accounting figures range from 1880 to 1913. Daily stock market data is available for the years 1892 to 1913. The data panels are unbalanced, as some of the companies were founded after 1880 and/or were taken over before 1913. Moreover, some of the accounting and financial data has to be omitted due to poor quality.

The stock prices used in the event studies were collected from the *Berliner Börsen-Zeitung*. In order to minimize volatility caused by technical market reactions alone, the raw series are corrected for dividend payments, subscription rights, and broken-period interest (a peculiarity of the German stock market). The market index is a value weighted performance index (see Osterbach & Gelman 2005). In the event studies on the first, second, and third cartel contract we can provide data for 18, 17, and 13 companies respectively. The accounting data used to calculate the ratios is from *Saling's Börsen-Jahrbuch*. We use data from 20 companies. The negotiation processes preceding the three contracts were illuminated using printed sources and archival material from the *Bergbauarchiv* in Bochum.

Preliminary Empirical Findings

In all three event studies, we can identify structural breaks that can be attributed to the respective contracts. In all three cases, this resulting event window is situated before the date on which the companies formally agreed on the new document. For the first contract, a window ranging from 27 January to 4 February 1893 was chosen. Presumably, this was the period in which the last two companies, whose membership had been made a *conditio sine qua non* for the formation of *RWKS*, finally agreed to join the cartel. In the event study on the second contract, a window covering 21 to 29 May 1895 was determined. Most probably, within these days it became clear to investors that an overwhelming majority of the members was willing to accept the revisited and prolonged contract, although negotiations over details continued for another month. The estimated event window for the study of the third contract ranges from 10 to 17 October 1903. Seemingly, this was the period in which the stock market became aware of the fact that in addition to almost all former members of the organization the vertically integrated iron and steel producers of the Ruhr district would join the new contract.

The average coefficient values of D_{RND} and D_{RSK} as well as the number of (significant) positive and negative coefficients are displayed in table 1.

Table 1: Average Coefficient Values of D_{RND} and D_{RSK} ; Number of Observations

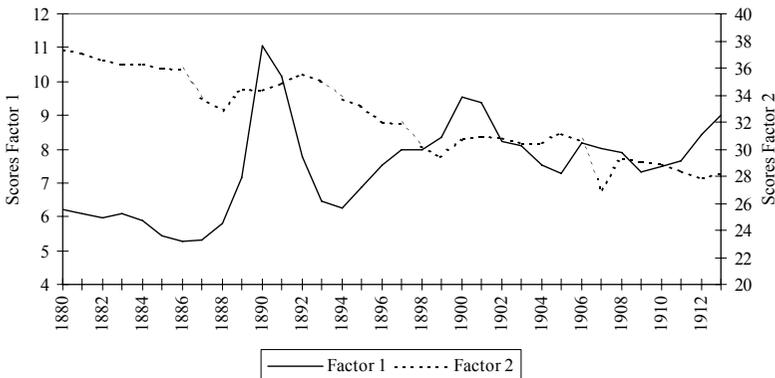
Event Window	1 st Contract 27 Jan. - 4 Feb. 1893	2 nd Contract 21 - 29 May 1895	3 rd Contract 10 - 17 Oct. 1903
D_{RND}	0.75	0.41	0.80
Binomial Sign Test (p -Value) ^a	0.00	1.00	0.00
Positive (and Significant)	18 (11)	9 (4)	13 (9)
Negative (and Significant)	0 (0)	8 (2)	0 (0)
D_{RSK}	-0.04	-0.04	-0.32
Binomial Sign Test (p -Value) ^a	0.24	1.00	0.09
Positive (and Significant)	6 (2)	8 (3)	3 (1)
Negative (and Significant)	12 (1)	9 (5)	10 (6)
No. of observations	18	17	13

^a The Null hypothesis of the test is that negative and positive coefficients are the same in number.

Given these results, one can conclude that investors expected a rise in profitability but no change in systematic risk from the first contract. For the second contract, we cannot argue compellingly for either a risk or a return effect. The event study on the third contract again points to significant positive return effects. Cautiously, one can also suggest a significant risk effect.

The results from the analysis of accounting figures are the following: the factor analysis resulted in two factors and consequently, two time-series of factor scores. The first factor is mainly determined by the four profitability and liquidity ratios; the second one by the two ratios covering financial and assets positions. The variability (measured by the standard deviation of the first differences) of the scores of factor one decreased significantly after 1893. The mean of the scores increased slightly but significantly. With only these results at hand, one is tempted to conclude that the accounting figures support the view of positive risk and return effects of the *RWKS*. However, it is very likely that at least in part, the rise in profitability/liquidity occurred due to the general upswing of the economy from the middle of the 1890s onwards. Moreover, the scores of factor 2 seem to be at odds with such an optimistic interpretation. The mean of this series becomes significantly smaller after the formation of the *RWKS*, indicating that with respect to their financial and assets positions, the economic situation of the cartel members was on average not improving but deteriorating. Other interpretations of the findings are also possible: for example, the cartel members might have used a decline in profit risk to boost their profitability by an increase in leverage.

Figure 1: Factor Scores from TSFA



In conclusion, we can convincingly argue that in the view of the capital market, the *RWKS* increased the profitability of the participating companies. With caution, we can also say that investors believed in a risk reducing effect of the third contract. The fact that we do not observe similar reactions in the event study on the second contract is presumably due to the fact that overall, the changes made to the first contract were only moderate. However, this positive assessment of the *RWKS* by the stock market is so far only partly corroborated by preliminary findings from the analysis of accounting data.

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Sowing the seeds of decline: the Thames merchant shipbuilding yards in the Napoleonic Wars

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The abdication of Napoleon in 1814 was cause for national celebration, but for the Thames shipbuilders it was yet another problem as the end of war meant the end of warship building in private yards. It coincided with a severe downturn in their other main source of business, the building, maintenance and repair of East India Company (EIC) ships. These had long been a good source of business for the Thames shipbuilders, but the EIC's monopoly in trade with India was now at an end.¹ The shipbuilders could do nothing about the war, but they could and did lobby Parliament about the effects of the loss of East India built shipping and a Select Committee met in 1814 to examine the petitions.² The economic picture painted by the Thames shipbuilders was one of a dramatic recession. Where in 1803 to 1804 there had been 2,500 ships being built on the Thames now in 1814 there were just 250. In 1813 there had been 4,000 men employed in the yards, one year later just 200. The building slips and repair docks were empty and people were starving.³ Only six of the twenty yards listed in the Select Committee's report were to survive to 1825.

Many of the witnesses testified to the superiority of the Thames yards and gave a range of external factors for their predicament. The success of the navy had resulted in the capture of many prize ships and these were now on the market and owners were buying these in preference to buying new. The forthcoming release of the transport ships from naval service would add to the problem.⁴ Additionally the EIC had been reducing its requirements for new ships, making each vessel sail many more voyages before replacing.⁵ There was also the competition from the shipbuilders in Bombay. But were these factors the only reasons why the Thames builders were suffering? The picture is a little more complex than they were willing to suggest and included many of the ingredients that were found by Pollard in his examination of the industry in the 1860s, when the collapse following a financial crisis brought unemployment to 40,000 in 1869.⁶ Pollard's view, later supplemented by Arnold, was that the Thames yards had a high cost base, were over dependent on government contracts and there were many unsound firms set up to benefit from government contracts leading to an oversupply.⁷

Using correspondence between shipbuilders and the Navy Board and parliamentary papers, especially the 1814 inquiry, this paper examines the apparent supremacy of the Thames yards and considers their efficiency in managing their operations at this time. To what extent were the shipbuilders responsible for their predicament?

Building for the Navy

The navy ships were large contracts; individual ships could be up to 2,000 tons, although the majority of ships such as frigates and gun vessels were below 500 tons. East India ships were also large contracts 800 to 1,400 tons and the Thames yards had considerable experience in these larger

¹ J. Keay, *The Honourable Company: A History of the English East India Company* (London: Harper Collins, 1993).

² British Parliamentary Papers (BPP) 1813-14 VIII: Minutes of the Evidence on Petitions relating to East India Built Shipping, pp.1-661.

³ BPP 1813-14 VIII: Account of shipwrights employed on the river, p.414, Evidence of John Hillman, p.10.

⁴ BPP 1813-14 VIII: Evidence of John Hillman, p.17, Evidence of James Hughes, p.23.

⁵ BPP 1813-14 VIII: Evidence of William Johnson, pp.420-1; Jean Sutton, *Lords of the East: The East India Company and its Ships, 1600-1874*, (London: Conway, 2000), pp.34-5.

⁶ S. Pollard, 'The Decline of Shipbuilding on the Thames', *Economic History Review*, 3 (1950), pp.72-89, 82.

⁷ A.J. Arnold, *Iron Shipbuilding on the Thames: An Economic and Business History* (Aldershot: Ashgate, 2000); Pollard, 'The Decline of Shipbuilding on the Thames'.

vessels.⁸ The new build figures of 60,071 tons built for the Navy Board and 38,996 tons for the merchants in three major yards (table 1), suggest a workload that was heavier from the navy during this time. However Dudman’s yard, estimated the ‘service was the same’ as the merchant ships came back for repair but not the King’s ships.⁹ The navy repaired its own ships whenever it could, but the East India and other merchant ships were repaired in the yards in which they were built. So the new building of one merchant ship meant a longer relationship with additional work, both repair and maintenance, over time than building for the navy. The importance of repair is also reflected in the high numbers of caulkers who were regularly employed in the Thames yards.¹⁰

Table 1: *Tonnage Built in Three Major Yards*

		King’s		Merchant ships incl. EIC	
		No	Tonnage	No	Tonnage
Dudman	1803-12	25	10926	13	7231
Barnard	1804-13	23	19529	33	19189
Wells/Wigram	1803-13	24	29616	13	12576
Total		72	60071	59	38996

Source: BPP 1813-14 VIII: Minutes of the Evidence on Petitions relating to East India Built Shipping, pp.443-57.

Building under contract for the navy could be lucrative, but could alternatively bring financial ruin when prices were pared too close, material costs went up on fixed contracts, or the size of the job was underestimated. Yet there was no shortage of merchant builders keen to build warships. Several of the yards were run by men who had previously served their time in the King’s yards and had an inside knowledge of what was required. Indeed due to the movement of shipwrights between merchant and King’s yards there were few yards that would not have had some access to information if they were based anywhere near a royal dockyard.

Shipbuilders constantly lobbied for contracts and to ensure that the Navy Board knew of their existence. The process normally began with a formal advertisement with an invitation to tender.¹¹ The Thames yards were at an advantage over yards elsewhere in the country in being physically close to the Navy Board offices. They could visit in person more easily and did not have to rely on agents acting on their behalf. Relatively fast as the post was, there were nevertheless inevitable delays in news or requests for decisions for those yards based at a distance from London. The outports were additionally disadvantaged by the sheer numbers of the London yards and the information flow that came inevitably from the interchange between shipwrights working in the yards.

Winning Business

The competition for the navy contracts was fierce. From October 1809 to September 1813, 140 tenders were received and just 21 per cent were successful. The Thames shipbuilders believed they were superior to yards elsewhere in the country; a view supported by Fearnell, at that time a surveyor of shipping.¹² However matching the list of tenders received with tenders accepted shows that the Thames yards won fewer contracts as superiority and reputation counted less than price (table 2). All of the 30 tenders accepted in this period were the lowest priced. The Thames builders were simply not bidding at the right price and the only bids won on the Thames in the later period were all won by Wigram (previously Perry Wells). Two of the winning tenders by Wigram were in January 1813 with no apparent competition for that particular call.¹³

⁸ BPP 1813-14 VIII: Ships built by Wells, Perry and Wigram, pp.433-5.

⁹ BPP 1813-14 VIII: Evidence of Samuel Jordan, p.426.

¹⁰ BPP 1813-14 VIII: Workmen of all classes employed on Thames, pp.399-418. Note: Caulkers filled the gaps between the planks to make a ship watertight. It was a job that had to be regularly redone.

¹¹ BPP 1813-14 VIII: Invitation to Tender 13th February 1813, p.561.

¹² BPP 1813-14 VIII: Evidence of William Fearnell, p.112.

¹³ BPP 1813-14 VIII: Minutes of the Evidence, pp.555-627.

Table 2: *Successful Tenders to the Navy Board 1809-13*

Region/County	Tenders accepted
Cheshire	1
Devon	5
Dorset	3
Hants/IOW	8
Kent	3
Norfolk	1
Suffolk	1
Medway	5
Thames	3

Source: BPP 1813-14 VIII: Minutes of the Evidence, pp.650-57.

Operational Management

The contract stages required careful management of supplies and payments. Work on the ship had to be managed around other matters, such as a non-government customer requiring urgent repairs. All shipyards had the challenge of managing constant work flow, but the sheer number of yards on the Thames added to the competition for contracts, men and materials. Competition from non-London yards was also a problem with some London based firms preferring to buy more cheaply from the north of England.¹⁴ Additionally, new Thames yards such as Beatson, Mews and Blackett were established to gain from the flow of government orders as well as existing yards expanding their provision by acquiring new yards (table 3). The table shows the change in the numbers of men employed over 10 years as contracts came and went. Tables 4 and 5 show the range of work won and managed by two of the largest yards, Barnard and Wigram.

Table 3: *Average of Shipwrights and other men employed in the Thames yards*

	1803	1804	1805	1806	1807	1808	1809	1810	1811	1812	1813
Wigram & Green	325	498	604	598	505	496	462	554	614	392	758
Barnard & Sons	225	317	343	168	290	278	274	285	306	350	172
Brent & Sons	248	401	418	364	289	403	528	452	483	452	134
Pitcher	126	173	247	153	211	150	171	130	248	178	157
Pitcher at Blackwell					122	169	150	193	121	141	117
Dudman & Sons	160	290	309	193	229	313	238	340	316	174	21
Mestaer	145	64	157	67	67	127	134	116	126	103	91
Thompson	41	21	48	39	33	40	39	61	52	29	33
Joshua Young	87	104	97	106	40	119	119	100	90	114	99
Hills	66	101	140	98	92	126	179	221	174	114	211
Curling	170	154	196	132	224	218	309	304	339	232	370
Dowson	67	91	63	60	70	117	103	121	71	68	120
Tebbut, Hitchcock	35	60	55	59	51	95	64	94	47	74	83
Ayles	123	122	122	123	102	133	104	136	122	108	101
Longbottom	55	48	38	59	36	38	51	69	35	40	26
Beatson					48	58	52	59	86	87	87
Mews				33	23	34	27	35	43	29	32
Blackett										85	
Fletchers	113	108	100	122	88	108	102	108	109	85	101

Source: BPP 1813-14 VIII: Minutes of the Evidence, p.399.

¹⁴ Simon P. Ville, *English Shipowning During the Industrial Revolution: Michael Henley and Son, London Shipowners, 1770-1830* (Manchester: Manchester University Press, 1987).

Table 4: *Contracts won by Mrs. Frances Barnard, Son and Robert's (number of ships)*

Year	King's ships Built	Private ships built	Ships repaired
1803	1	3	72
1804	2	5	81
1805	1	2	87
1806	1	1	66
1807	3	1	75
1808	4	1	79
1809	3	0	93
1810	2	1	77
1811	2	2	90
1812	2	1	69
1813	1	0	65
Total	22	17	854

Source: BPP 1813-14 VIII: Minutes of the Evidence, p. 449.

Table 5: *Contracts won by Perry Wells/Wigram (number of ships)*

Years	Government Built	Merchant Built	Government Repair	Merchant Repair
1804			8	79
1805			3	48
1806	1	1		38
1807	2			46
1808	2	2		44
1809	2	3		77
1810	1	3		79
1811	1	1		68
1812	1	1		45
1813				51
Total	10	11	12	575

Source: BPP 1813-14 VIII: Minutes of the Evidence, p.443.

Together with managing work flow was the task of managing cash flow and this was a significant challenge in war time when supplies of men and materials could be uncertain. In 1805, one 1,000 ton East India ship earned its builders £31,000.¹⁵ A 64-gun ship built for the navy, earned Randall and Company £17,250 in 1795.¹⁶ However each East India ship that came back to the yard for repair and maintenance was worth a considerable sum to the shipbuilder over its lifetime. The repair work on the 500-ton *Tigris* between 1803 and 1814 came to £11,572 while that on the *Sir William Poultney* over seven years was £5,695.¹⁷

Management Efficiency

Repair work could keep a yard going when new building was not available. What was also important was to ensure that the yard was not dependent on just one customer. However what can be seen in

¹⁵ BPP 1813-14 VIII: Minutes of the Evidence, p.45.

¹⁶ The National Archives (TNA): ADM 106 /1454 Attached to letter from Barnard & Co 17 Sept 1795.

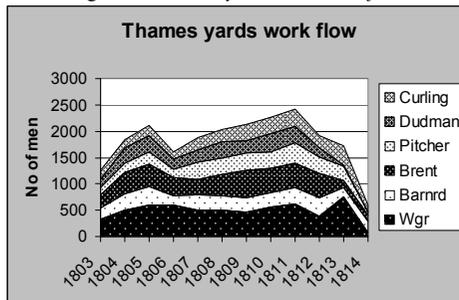
¹⁷ BPP 1813-14 VIII: Minutes of the Evidence, p.133.

table 2 is that the Thames shipbuilders were generally able to employ a very steady stream of workmen across the 12-year period from 1800 despite the fluctuations in navy orders.

The navy contracts expected the vessel to be ready on the date agreed and fines (mulcts) were specified for late delivery. Fines amounting to a total of £20,332 were imposed on shipbuilding contracts between 1801 and 1814. The Thames yards were highly efficient, they had been used to handling larger vessels for many years, and just three Thames-based builders were fined, Ayles £600, Dudman £150 and Pitcher £500.¹⁸

The evidence of the navy shipbuilding contracts from 1800 shows that the Thames yards were efficient in their management of workflow and in the delivery of orders. But their high costs (due in part to high labour costs) meant that they were less successful than the shipbuilders in other parts of the country in winning contracts. In London in 1802, there were strikes by workmen holding out for more wages.¹⁹ John Hillman, a surveyor, spoke of the higher costs on the Thames for both materials and an increase of wages. He referred to combinations of sawyers and caulkers striking for more pay because of the increasing costs of their provisions.²⁰ Another witness spoke of the lower shipwrights wages in the North.²¹ There was demarcation between the shipwrights and caulkers in the Thames yards while elsewhere in the country there was more flexibility of labour with shipwrights doing the work of caulkers.²² With the loss of the navy orders and the slow down in EIC building, the Thames yards were in a very vulnerable position. Only the most effective and efficient management would enable yards to survive the crisis. In lieu of surviving data on profitability, the workforce employment figures will have to suffice. The chart below (figure 1) shows a comparison of the number of men employed by the yards over the period. The significant dip in 1806 was the delayed response to a lack of navy orders after the Peace of Amiens in 1802. Those yards that managed that earlier crisis by speedily finding other work to fill their yard would be in the best position to survive. The chart shows that, over the whole period, Wigram and Barnard managed the dip in contracts most successfully. Wigram did survive the 1814 crisis and was the only Thames yard to win contracts between 1809 and 1813. Barnard survived until 1819 and in their case other factors may have been at work in finally closing their yards.²³

Figure 1: *Thames yards and work flow*



Source: as Table 3.

¹⁸ The National Archives (TNA): ADM 49/102 An account of ships of war.

¹⁹ TNA: ADM 1456 1802-1804 letters to Navy Board from Barnard 28th July 1802, 29th Oct 1802; Letter from Dudman 21st Aug 1802.

²⁰ BPP 1813-14 VIII: Evidence of John Hillman, p.8.

²¹ BPP 1813-14 VIII: Evidence of James Hughes, p.31.

²² BPP 1805 VIII: An account showing the number of shipwrights and also of apprentices employed in the merchant yards of Great Britain according to the returns made to the Admiralty in April 1804, pp.467-91.

²³ J.E. Barnard, *Building Britain's Wooden Walls: The Barnard Dynasty C. 1697-1851* (Oswestry, 1997).

The new yards established to capitalize on the navy orders had disappeared by 1820. In such extremely tough trading conditions only those yards with effective management could survive. Much as the witnesses from the Thames yards who presented their evidence before the Select Committee tried to explain the wide range of factors operating against them, there was one significant aspect that they omitted to mention. They were uncompetitive in their pricing strategy and this would be a problem that would continue to haunt them as they moved into iron and steam.

Pollard and Arnold's view of the eventual demise of shipbuilding on the Thames echoes many of the findings in this paper. The Thames yards by 1850 had expanded again and up to 60 per cent of the Admiralty orders for outside work went to the Thames. The year 1865 was the high point when 28.7 per cent of the United Kingdom's tonnage was launched from the Thames, but by 1867 it had fallen to 2.3 per cent and never recovered. Among the weaknesses identified were high wages linked to rigid wage contracts.²⁴ Pollard points out the strength of the unions from 1825, yet even in 1802 the caulkers were able to strike for the whole of the summer and Dudman had complained of a workman's strike in 1810. Additionally Pollard points to labour demarcation, again an aspect that featured earlier in the century. Because of their success in mid century Pollard summarized the attitude of the Thames shipbuilders as 'contemptuous of change when new conditions called for a new structure and a high degree of flexibility'.²⁵ This reflects back to the attitude of the witnesses before the Select Committee in 1814 who testified to the superiority of the Thames yards. Few of the original builders of wooden shipbuilding went on to become significant iron shipbuilders, Wigram being a notable exception.²⁶ Oversupply was another factor as new shipyards appeared on the scene, just as in the earlier period, to take advantage of the orders.²⁷ It seems the lessons of the Thames shipbuilders in the aftermath of the Napoleonic wars were not learnt by their successors.

This early period of wooden shipbuilding has been overlooked by historians keen to examine the exciting newer technological and business changes. Broad and incorrect assumptions about the nature and structure of the earlier businesses have been made to highlight the decline of the later industry and more research is required to balance the picture across the century. The early Thames yards had a strong sense of their superiority, but it counted for little in a price war. The owners of the yards managed the flow of orders effectively and delivered their ships on time. But no amount of good management of contracts compensated for a strategy that depended too much on government or EIC orders and an inability to win new business.

²⁴ Pollard, 'The Decline of Shipbuilding on the Thames', pp.72-89.

²⁵ Ibid., p.72.

²⁶ Arnold, *Iron Shipbuilding on the Thames*, Henry Green, and Robert Wigram, *The Chronicles of Blackwall Yard, Part 1* (London, 1881).

²⁷ Pollard, 'The Decline of Shipbuilding on the Thames'. p.81.

Competition and technological change in semiconductor lasers, 1960-90

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Following from Albert Einstein's 1905 theoretical conception of the photoelectric effect, an American physicist Gordon Gould invented Laser (Light Amplification by Stimulated Emission of Radiation) in 1958. It was called 'the greatest invention of the century'.

A laser is an optical source that emits a narrow beam of coherent light. The power in a continuous beam ranges from a fraction of a milli watt to more than a mega watt. The range of laser application is broad in scope ranging from commercial uses to special military applications.

The semiconductor laser became one of the most important technologies underlying the drastic changes that took place during the last half of the twentieth century in information technology, and it has become the most widely used laser since the 1980s. It is mainly used for information storage such as compact disk and digital videodisk system, which can store a 30-volume encyclopaedia set of information on a disk and can access an arbitrary element of information in equal time. It is also employed for fibre-optic communication, which permits digital data transmission over long distances and at higher data rates than electronic communication.

From the mid-1970s, Japanese technology-intensive industries gained competitiveness and became the key industries in the national economy. The fundamental question underlying my dissertation is how the technology-intensive industries gained competitiveness.

Surveying key industrial technologies in 1983, the Agency of Industrial Science and Technology of Japan designated semiconductor laser technology as one of the most competitive key industrial technologies in the technology-intensive industries. The industrialization of laser technology started in the 1970s. Japanese firms became competitive in this industry at the beginning of the 1980s. Scrutinizing the technological development of semiconductor lasers, this paper studies how Japanese firms gained technological competitiveness in semiconductor laser technology.

The Japan Technology Evaluation Centre (JTEC) and the Agency of Industrial Science and Technology (AIST) have provided important reports on semiconductor lasers. Reviewing the optoelectronics industry in the US and Japan, JTEC found that 'Japan clearly led in consumer optoelectronics, that both countries were competitive in communications and networks, and that the United States held a clear lead in custom optoelectronics. Japan's lead in high-volume consumer optoelectronics and related technologies gave it a dominant share of the overall global optoelectronics market'.²⁸ Based on an extensive questionnaire survey, AIST indicated that the firms' fierce competition in the same semiconductor laser market played an important role in technological development.²⁹

Based on these findings, this paper scrutinizes the development of semiconductor laser technology from 1960 to 1990 and explores this issue with two research questions:

²⁸ The Japan Technology Evaluation Centre (JTEC), which was the US government's supported research centre, and its companion World Technology Evaluation Centre provided assessments of foreign research and development in selected technologies under a cooperative agreement with the National Science Foundation. Its mission was to inform US policy makers, strategic planners, and managers of the state of selected technologies in foreign countries in comparison with the US. Forrest, Stephen R.; Coldren, Lary A.; Esener, Sadik C.; Keck, Donald B.; Leonberger, Fredrick J.; Saxonhouse, Gary R. and Whumate, Paul W. 'Jtec Panel on Optoelectronics in Japan and the United States Final Report,' Baltimore, Maryland: Japanese Technology Evaluation Center/ International Technology Research Institute, 1996. Abstract.

²⁹ Kogyo Gijutsu In Somubu Gijutsu Chosaka, (Agency of Industrial Science and Technology). *Wagakuni Sangyo Gijutsu No Taishitsu to Kadai, (Survey of Japanese Industrial Technology)*. Tokyo: Tsusho Sangyo Chosakai, 1983.

Research Question 1: How did Japanese firms come to compete in the same technological area with the same technological choice for a longer term than their counterparts in North America and Europe?

Research Question 2: How did this pattern of the strategic behaviour of the firms affect technological change in semiconductor lasers?

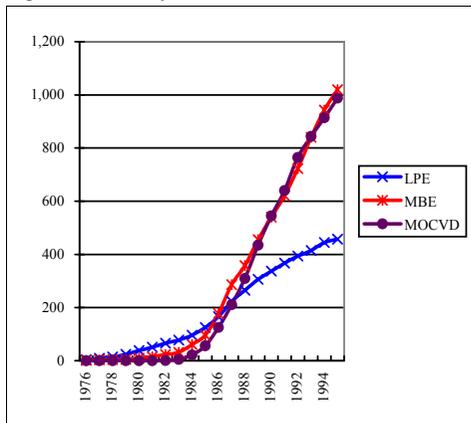
Through scrutinizing patent data, it aims to show how certain patterns of competition among the firms affected the areas in which knowledge spillover effects emerged and resulted in different paths of technological development in the US and Japan. More concretely, North American firms tended to differentiate their R&D. Furthermore, numerous business ventures spun off from the parent firms and targeted niche markets. Therefore, knowledge spillover emerged in the areas where semiconductor laser technology was applied and exploited to fill untapped markets. In contrast, the pattern of competition of Japanese firms induced knowledge spillovers to enhance the development of core semiconductor laser technology instead of exploiting niche product markets.

Strategic choice in epitaxy technology: LPE, MBE and MOCVD

Semiconductor laser technology is composed of numerous sub technologies. This paper examines epitaxy technology, which was the most important technology in the semiconductor laser. The *Optoelectronics Handbook* noted, ‘The epitaxy technology is the most important semiconductor laser manufacturing technology because the performance and the production costs of the semiconductor laser highly depend on the epitaxy technology’.³⁰

Three epitaxy technologies, LPE, MBE, and MOCVD, were competing by the end of the 1970s. LPE, invented by RCA in 1963, was the status quo technology for the previous ten years. MBE was invented by Bell Laboratories in 1975, and was excellent at the deposition process, which was one of the important manufacturing processes. MOCVD, which was invented by Rockwell in 1977, had potential advantages in high throughput and the deposition process. Since it became much clearer that either MBE or MOCVD would be the dominant epitaxy technology by the mid-1980s,³¹ many firms began to shift their R&D focus from LPE to either MBE or MOCVD.

Graph 1: Number of Patents in LPE, MBE, and MOCVD



Source: Derwent Innovations Index.

³⁰ Oyo hikair electronics handbook hensu iinkai. *Oyo Hikari Electronics Handbook*. Tokyo: Shokodo, 1989. p.105.

³¹ Mechatronics henshubu, (Editorial Division of Mechatronics). *Saisentan No Optoelectronics, (the Frontier of Optoelectronics)*. Tokyo: Gijutsu chosakai, 1985.

The firms were competing to develop a reliable semiconductor laser with either MBE or MOCVD, because the semiconductor laser had not been successfully manufactured with either of these technologies. In the process of the technological change from LPE to MBE and MOCVD, the strategic behaviour of Japanese firms was clearly different from that of North American firms. Japanese firms simultaneously conducted the same technological choices as their domestic rivals, while North American firms made different choices. Figures 1 and 2 reveal the differences in technological choices among firms in North America and Japan. They list all of the firms that obtained patents in semiconductor laser more than once from 1970 to 1980, and when they obtained their first and last patents in MBE and MOCVD. It is assumed that the firms listed in the tables began R&D in semiconductor laser with LPE before they acquired patents in MBE or MOCVD. Additionally, if the firms did not obtain a patent in MBE or MOCVD, it is assumed that they did not participate in R&D competition in epitaxy technology. These figures demonstrate three important points: the technological choice of the firms and the timing of their start and exit.

- Most Japanese firms engaged in R&D competition in both MBE and MOCVD, while some North American firms adopted neither MBE nor MOCVD.
- Japanese firms made technological choices more simultaneously than did North American firms.
- Japanese firms competed in MBE and MOCVD areas over relatively longer periods than did North American firms.

It pays attention to the third point and explores why Japanese firms competed in the same technological area with the same technological choice longer than their counterparts in North America. How did this pattern of the strategic behaviour of the firms affect technological change in the semiconductor laser?

Vertical Integration and R&D Competition

Technological choice of the firms depends on the expected return from R&D. Directing its attention to the degree of vertical integration of competing firms, it reveals that Japanese firms involved in semiconductor laser R&D competition had more incentive to compete in the same technological area than did their North American rivals.

Tables 2 and 3 list the firms involved in semiconductor laser R&D and their final products. A black dot denotes that the firm produced or planned to produce a final product from the 1970s through 1990. Showing whether the firms were manufacturing only semiconductor laser or whether they were involved in producing a final semiconductor laser product, these tables demonstrate the level of downward vertical integration of firms in the semiconductor laser business. These tables clearly demonstrate the differences in downward vertical integration between North American and Japanese firms. All of the Japanese firms were manufacturing electric devices and also final products (for example, optical memory/computers, optical communications, compact disk/laser disk players, and printers/scanners). Even though some of the North American firms were involved in optical communication and research instruments, the market for these products was much smaller than that for other final products (for example, compact disk and laser disk). Many Japanese firms were involved in manufacturing multiple final products, however, only Bell and Xerox were involved in more than one area of final products.

The difference in the level of downward vertical integration affected the strategic technological choice of the competing firms. Since the US semiconductor laser manufacturers did not integrate the downstream manufacturing process of semiconductor laser application, they sold their product through market transactions. The product assemblers bought the semiconductor laser from the manufacturer that made the best offer, and then assembled it into application. Moreover, with the high sunk costs and the learning curve effect, which were important features of technology-intensive industry, the market was likely to be oligopolistic. Thus, the less integrated semiconductor laser suppliers had a strong incentive to differentiate their laser so that they could provide the best offer on the market and raise their profit. It was risky to compete in areas in which many competitors

existed. The semiconductor laser manufacturers sought to select smaller targeted markets and differentiate their products in order to become competitive in a niche market. If they could not do so, they exited from the competition.

When a firm integrates a downward process, the appropriability of the R&D becomes higher due to secure in-house demand. Other conditions being equal, the more integrated firms had higher expected returns from R&D. The integrated firms did not necessarily profit – or need to profit – from the semiconductor laser device because it was only one of the devices composing a final product. The highly vertical integrated firms did not necessarily need to expel their rivals from the semiconductor laser market because they had a secure demand for semiconductor laser within their own firm. Moreover, integrated firms could undertake complex negotiations on the specification and price of the semiconductor lasers through hierarchical and organizational decision-making.³² High vertical integration brought about a higher expected rate of return in semiconductor lasers; as a result, firms could invest in the semiconductor laser relatively longer than the less vertically integrated device manufacturers.

Knowledge Spillover

This pattern of technological choice affected the technological development of semiconductor lasers. Japanese firms were competing in the same technological areas longer than North American firms. Since a number of firms were competing in the same technological area for a certain amount of time, the aggregated amount of R&D investment in the area became larger. The increase in R&D investment enhanced the possibility of the successful R&D results. Furthermore, the level of vertical integration among the competing firms had a strong impact on the pattern of competition and technological spillovers. Griliches and Jaffe contended that more technological spillovers would emerge if the firms that adopted similar technology and targeted similar markets conducted R&D in the same technological areas.³³

The competition patterns differed in the areas in which knowledge spillovers emerged. As JTEC reported, North American firms tended to target niche and small customized markets. Additionally, in the US, numerous small business ventures such as Lasertron, Sensor Unlimited, and Ortel spun off from parent firms launched into business to manufacture highly specialized laser, modulator, or detector devices, all of which were niche markets by using semiconductor laser technology.³⁴ As a result, knowledge spillover emerged in the areas where semiconductor laser technology was applied and exploited to fill untapped markets in the US.

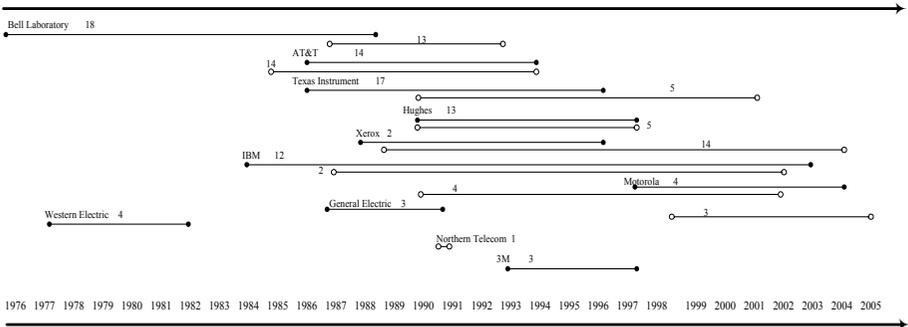
While North American firms assumed an R&D differentiation strategy, Japanese firms targeted the same market with the same technological choice. Epitaxy technology, which was the most economically and strategically important semiconductor laser technology, was their R&D target. The pattern of competition of Japanese firms induced knowledge spillovers to enhance the development of core semiconductor laser technology instead of exploiting niche product markets.

³² About hierarchical decision-making and market transaction, see Williamson, Oliver E. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. New York, London: Free Press; Collier Macmillan Publishers, 1987.

³³ Griliches, Zvi. 'The Search for R&D Spillovers.' *NBER Working paper*, 1991, (Working Paper No.3768), Jaffe, Adam B. 'Technological Opportunity and Spillovers of R&D: Evidence from Firms' Patents, Profits, and Market Value.' *The American Economic Review*, 1986, 76(5), pp.984-1001.

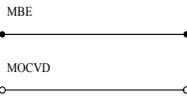
³⁴ Forrest, Stephen R.; Coldren, Lary A.; Esener, Sadik C.; Keck, Donald B.; Leonberger, Fredrick J.; Saxonhouse, Gary R. and Whumate, Paul W. 'Jtec Panel on Optoelectronics in Japan and the United States Final Report,' Baltimore, Maryland: Japanese Technology Evaluation Center/ International Technology Research Institute, 1996 p.7

Figure 1: *Technological Choice of US Firms in MBE and MOCVD*



The followings did not obtain any patent in either MBE or MOCVD.

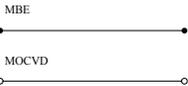
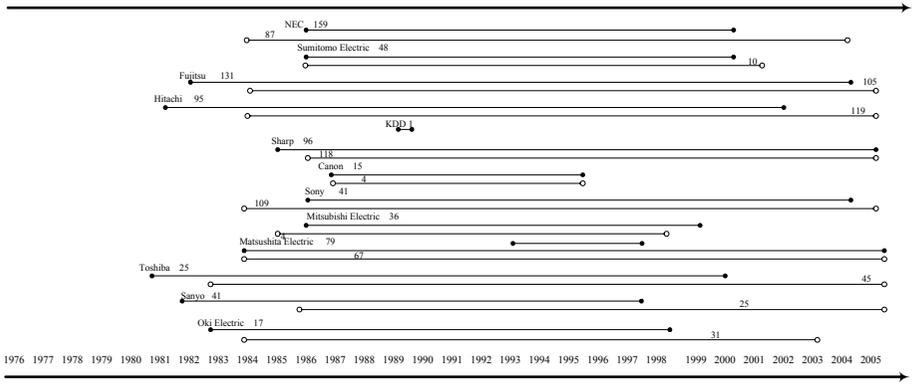
- Energy Conversion
- National Semiconductor
- Northern Electric
- Exxon
- International Standard Electric
- RCA
- Westinghouse Electric
- Standard Tel & Cable
- Perkin-Elmer
- ...



The line shows the first year and the last year that the firm obtained patent in MBE or MOCVD. The number denotes the number of patents the firm obtained.

Source: Europe Patent Office, Patent.

Figure 2: *Technological Choice of Japanese Firms in MBE and MOCVD*



The line shows the first year and the last year that the firm obtained patent in MBE or MOCVD. The number denotes the number of patents the firm obtained.

Source: Europe Patent Office, Patent Database.

Table 2: *Semiconductor Laser and Final Products of North American Firms*³⁵

Firms	Semiconductor Laser		Final Products				
	Short-Wave	Long-Wave	Optical Memory	Optical Communication	CD /LD	Printer /Scanner	Research Instrument
Bell	•	•	•	•			
AT&T		•		•			
Xerox	•	•		•		•	
RCA	•				•		
IBM	•		•				
General Electric	•	•		•	•		
Hughes Aircraft		•		•			
Motorola		•					
Perkin-Elmer		•					•
Rockwell		•	•	•			
Westinghouse	•				•		
Western Electric		•		•			
Energy Conversion		•					•
Texas Instrument		•					•
International Standard Electric		•					
Exxon							•
3M		•					
Standard Cable		•		•			
National Semiconductor		•					•

Source: ([the Japan Development Bank] Nihon Kaihatsu Ginko, 1986, [The Editorial Board of Electric Device Annual Report] Sogo denshi buhin nenkan henshu iinkai, 1984, Sogo Giken Kabushikigaisha, 1981)

Table 3: *Semiconductor Laser and Final Products of Japanese Firms*

Firms	Semiconductor Laser		Final Products				
	Short-Wave	Long-Wave	Optical Memory	Optical Communication	CD /LD r	Printer /Scanner	Research Instrument
NEC	•	•	•	•	•		•
Hitachi	•	•	•	•	•	•	•
Sumitomo Electric		•		•			•
Canon	•	•				•	
NTT		•		•			
KDD		•		•			
Fujitsu	•	•	•	•	•	•	•
Mitsubishi	•	•	•	•	•	•	•
Toshiba	•	•	•	•	•	•	•
Matsushita	•	•	•	•	•	•	•
Sharp	•		•		•	•	
Sony	•		•		•	•	
Sanyo	•				•	•	
Oki		•		•		•	•

Source: ([the Japan Development Bank] Nihon Kaihatsu Ginko, 1986, [The Editorial Board of Electric Device Annual Report] Sogo denshi buhin nenkan henshu iinkai, 1984, Sogo Giken Kabushikigaisha, 1981)

³⁵ Research instrument and others include semiconductor laser applications such as measuring instruments, laser pointers, heat treading, and seam welding.

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Fashion sprayed and displayed: the market for perfumery in nineteenth-century Paris

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Studying fashion facts allows us to assess problems at the intersection where social and economic history meet. From an economic point of view the nineteenth century was a crucial time in the evolution of the perfumery market. It was an age of transition that turned perfumery products³⁶ from luxury items to broadly distributed and more widely diffused commodities. In 1810, the perfumery trade in France represented a little less than 2 million francs.³⁷ By 1900 production of these assorted products had risen in value to 80 million francs.³⁸ New hygienic practices were, if not yet global, becoming a more regular and routine part of daily life. However, even though the shift of sensibilities and the progress of hygiene in the development of the perfume industry were critically important, these were not sufficient to account for the widespread consumption of scented products. Like clothing indeed, perfumes were part of a cultural communication. Thus, perfume offers an excellent opportunity to position the person who wears it into the normalized social field of his/her time. On this account, like any other element of women's costume, perfume consumption was a fashion fact and its uses reflect on the priorities of the time and the ethos of its consumers.

In the case of perfumery, how can this fashion phenomenon be related to the economic development of the industry in the nineteenth century? Focusing on the Parisian market – then the largest in Europe – this study will examine the way fashion and industrial concerns interacted to shape the social olfactory landscape of a time. Beneath the great history of representations established by Alain Corbin in *Le Miasme et la jonquille*³⁹ (*The Foul and the Fragrant*), a history of olfactory tastes appears feasible, whose approach consists in challenging the olfactory choices the perfumery of a time offered to its consumers to the reception these scents received. It is at this intersecting point – the act of production and of its reception – at the meeting of creative processes and of consumptive choices that the olfactory fashions of a time arise. This study was based on the perusal of about twenty perfumers' catalogues, edited between 1827 and the beginning of the 1900s. Together with the advertisements published in the women's press, they give a better account of the products effectively offered to consumers than perfumers' handbooks of formulae. Manuals of manners and the women's press being both powerful prescriptive agents whose published forms grew considerably over the century, with wider and wider distribution, I confronted these catalogues and advertisements to about twenty-five manuals of manners published between 1804 and 1909, and the articles of the women's press published by *Le bon ton* between 1836 and 1879 and *Le petit messager des modes* between 1842 and 1896. A corpus of about thirty novels also figures among the sources of this work.

³⁶ Perfumery products include all fragrant toiletries: alcoholic extracts, toilet waters and vinegars (meant to perfume the water used to wash oneself), eaux de Cologne (whose use was often therapeutically prescribed as well as hygienic), lotions, hair oils and pomades, rice powders, fragrant wardrobe sachets, and soaps – these last items represented a very massive part of the industry products.

³⁷ Charles-Louis Barreswil, 'La parfumerie en 1862', in Charles Laboulaye, ed., *Annales du Conservatoire Impérial des Arts et Métiers*, Paris, Librairie scientifique industrielle et agricole de Eugène Lacroix, 1st series, vol. 4, 1863, p.273.

³⁸ Alfred Picard, *Exposition universelle internationale de 1900 à Paris. Le bilan d'un siècle (1801-1900)*, vol. V: 'Industrie chimique. Industries diverses. Economie sociale', (Paris, 1906), p.115.

³⁹ Alain Corbin, *Le Miasme et la jonquille: l'odorat et l'imaginaire social XVIIIe-XIXe siècles*, (Paris, Aubier-Montaigne, 1982), p.336. English edition: *The Foul and the Fragrant: Odour and the Social Imagination*, (London, 1994). Through his study Corbin highlights a major evolution of sensibilities with a significant drop in the olfactory tolerance point, which caused people to shy away from the heavy odours of filth and musk and move toward the refined exhalations of pure light smells such as daffodil.

What I intend to do here is not to redraw the history of the fashions of nineteenth-century perfumery, but to highlight its main processes and to emphasize its links to the economic vitality of this sector. I will explore these problems through three main trajectories. The first deals with the specificities of perfumery with regard to fashion in nineteenth-century Parisian society; the second analyses different cases of raw materials and their relation to fashion phenomena; and the last tackles the subject of the fashioning and marketing of perfume products in the general context of industrialization and the decrease in production costs.

I. A problematic diffusion of olfactory fashions

As a first point, obvious though it may seem, I would like to insist on the specificities of perfumery with respect to the fashion context of nineteenth-century Parisian society. Specific processes indeed distinguished olfactory styles from vogues in dress. As a first and fundamentally distinctive feature, the business of perfumery had to compensate for the absence of visual imagery in its products. As such, perfume offers a problematic case for the theory of conspicuous consumption put forward by Thorstein Veblen,⁴⁰ since there are no visible signposts in the selection of perfume. Utterly superfluous and notoriously frivolous, perfume remains intrinsically fleeting, evanescent – elusive. To spread, olfactory fashions cannot rely on direct visual observation, or distant ocular demonstrations of consumption. An elegant woman will always remain olfactorily silent to the vast majority of people removed from her immediate path.

This material ambiguity was all the more significant in the nineteenth century since a strong emphasis on discretion governed the rules of etiquette. Even if the argument of hygiene helped diffuse the practice of perfume use, there were also powerful advocates for moderation and discernment in the choice and amount of fragrance employed. These injunctions to observe an olfactory discretion tended to grow over the course of the century, going so far as to exclude heavier perfumes, if not all scents. Authors of these rules were unequivocal in their warnings: ‘A good-mannered woman does not wear any perfume. She leaves them to women of easy virtue, for whom they are the exclusive prerogative’.⁴¹ Moral arguments were marshalled to justify the banishing of heady perfumes, particularly a use of scent likely to contravene the approved reserve prescribed for women in polite society.

II. Nineteenth-century olfactory fashions

Olfactory volume figured as one of the principal elements in the social olfactory field of nineteenth-century Paris; the fragrance milieu was further structured by a classification of socially permitted odours, subdivided between fashionable perfumes and more common or even vulgar ones. The olfactory norm of the time accepted only a relatively small range of aromas. Eau de Cologne and lavender water held an unquestionable supremacy as the two main olfactory constants of the time; they reflected an ideal discretion and their hygienic authority was never in dispute. Only within the strict limits of this norm, defined by good taste, could fashions flourish every now and then. Throughout the century fashionable variations arose exclusively among floral essences, shaped in part by the gendered logic of floral symbolism; the choice of the principal raw material determined the distinction of the product.

Violet scents had thus an extraordinary vogue throughout the second half of the nineteenth century, a phenomenon for which there is no other explanation but the strength of the symbolism this flower engenders, synonymous with the ideals of modesty expressed in the language of flowers – an idiom women of the time mastered perfectly. The manuals of manners raised then a unanimous cry: ‘Iris, violet are to be recommended’.⁴² Both economic and social factors interacted to sustain the longevity of the vogue for violet: the end of the century was consecrated to its reign when, in 1893,

⁴⁰ Thorstein Veblen, *The Theory of the Leisure Class*, (New York, 1899).

⁴¹ Ermance Dufaux de la Jonchère, *Le savoir-vivre dans la vie ordinaire et dans les cérémonies civiles et religieuses*, (Paris, 1883), p.6.

⁴² Baronne Staffé, *Règles du savoir-vivre*, p.334. Iris and violet are of very close olfactory nature.

Tiemann and Kruger, at the end of lengthy research on this subject, succeeded in synthesizing ionon, which smells of both violet and iris. In 1910, there were six lines of violet-perfumed products that co-exist in the catalogues of Roger & Gallet. In 1905 the *Vera Violetta* range included 31 references to 16 different products, testimony to the continuing power of this scent.⁴³ This huge success must not mask however the gradual loss of prestige linked to its social diffusion.

On 2 October 1861, Prince Charles Egon of Furstenberg orders three little jars of *Pommade de l'Impératrice* scented with *Violette de Parme* from Pierre-François-Pascal Guerlain.⁴⁴ But this scent did not remain an elite commodity for every long. In February 1869 Octave Mouret put a silver fountain of violet water in the middle of his department store, *Au Bonheur des dames*, on the day of the linen sale he organized – this scent was now synonymous with bourgeoisie.⁴⁵ By 1880, violet had become *Nana's* perfume, in Zola's classic tale of a prostitute's reign in the fashionable demimonde.⁴⁶ Thus violet perfume went through various cultural associations over time, as well as permeating various social ranks. Its diffusion was facilitated by both the drop in production costs and in price, its fashion kept alive by the tendency to imitation described by Georg Simmel, its reception among consumers sustained by the complexities within the cultural matrix through which it diffused.

Other fashions, more or less lasting, more or less powerful, remained through a decade or two of the century, mostly due to the discoveries of chemically synthetic substances, such as heliotrope in the 1880s: synthesized in 1869 by Fittig & Mielk, heliotrope was produced industrially from 1874 and reached a significant output by 1886. Entirely new in perfumery, this scent appeared in Guerlain's catalogue at the very beginning of the 1880s; at the end of the century, every perfumer's catalogue mentioned it. Between 1879 and 1899 indeed, the price of one kilogram of piperonal fell dramatically, from 3,790 francs to 37.5 francs. Other fashionable fragrances included ylang-ylang in the 1870s,⁴⁷ lily-of-the-valley and lilac in the 1890s,⁴⁸ carnation in the very last years of the century.⁴⁹

However, I must emphasize the fact that the success of a scent was first conditioned by its inscription within the social olfactory field of tolerable smells. The synthesis of musk by Baur in 1888, should it have been the result of an effective quest, did not result in a fashion for musk-based perfumes, despite the drop in its production costs. Musk was used widely, for it was necessary to compound perfumes; but musk under no circumstances became a fashionable scent. This powerful scent was antithetical to good taste, the very incarnation of vulgarity and impropriety, whatever the rank of the person who wore it, however elevated the social position. Though of irreproachable stature, the perfume chosen by Queen Victoria at the time of her official visit to Paris in 1855 contained a 'distasteful hint of musk'⁵⁰ that *Le Messenger des modes* did not hesitate to denounce.

What counted in the final analysis was what was said about perfume and its content, as perfumers themselves concurred: 'It is fashionable today to say that you do not like musk. My great experience allows me to say that the taste of the public for this scent is as big as perfumers can wish. Any perfume that will contain some musk will always be the one that the public prefers, as long as the merchant is sure to tell the buyer that there isn't any'.⁵¹ Of course the ingredients were not unimportant. But their symbolic power, the distinction they conveyed, whether it was because they were different or because they were new, eclipsed the olfactory criteria or even the argument of

⁴³ Roger & Gallet: *parfumeurs et créateurs, 1806-1989*, Bernay, Association pour la promotion de la culture à Bernay, 1987, pp.49-50.

⁴⁴ Guerlain's Archives.

⁴⁵ Emile Zola, *Au Bonheur des dames*, (1883, Paris, 1984), p.455.

⁴⁶ Emile Zola, *Nana*, (1880, Paris, 1994), pp.413, 416, 447.

⁴⁷ The scent of ylang-ylang is not due to a new chemical synthesis but to the distillation of a newly exploited plant from Manila and the Philippines.

⁴⁸ Conditioned by the synthesis of terpineol.

⁴⁹ The synthesis of isoeugénol by Tiemann was made in 1890.

⁵⁰ Alain Corbin, *Le miasme et la jonquille*: p.323, note 126.

⁵¹ 'Le musc en parfumerie', *La Parfumerie*, 2nd year, n° 25, 12th August 1888.

effectiveness.

III. Marketing perfumes, fashioning scents

Thus, paradoxical as it may seem, because of perfume's intrinsic fleetingness, because of the taste of nineteenth-century Parisian society for the most delicate perfumes and its demand for the utmost discretion in their use, the fashioning process remained somewhat removed from the fragrance itself. Indeed, most properties of the perfume were accounted for, and even constructed by, the discourse of which it was a part, whether this was expressed by consumers themselves or by the prescriptions of the women's press or of the manuals of manners. This reputation was also expressed by the very system of signs that directly surrounded the perfume itself: its name, its bottle, its label, its advertisements, the boutiques in which it was sold – all contributed to embody the product, to convey an image to which the product was linked. This commercial rhetoric was the only way to associate perfume to elements of a visible and expressible nature. Here was the real arena where a fashioning process was consciously employed. Here was the real field in which nineteenth-century perfumers displayed their marketing skills and their struggle for sales. Whether symbolic or formulated, the discourse surrounding this fashioned product came first, aimed to construct its symbolic value and its desirability in consumers' eyes. In a general context, with the drop in production costs due to the fall of the price of raw materials and to the industrialization of the sector, it was all the more essential to associate perfumery with the concept of luxury. What the product lost in intrinsic value had to be gained in symbolic value.

Despite the growth in the production of perfumery indeed and the drop in the cost of raw materials and in labour costs, prices seem to be sustained at the high end of the trade over the second half of the century. A perusal of the catalogues of the Coudray perfumery, between 1850 and 1876, shows for instance a remarkable stability in prices during this period. In a general context of rising salaries, perfumery became a relatively more accessible product. Considering, however, that the average daily wage of a man in the department of the Seine rose to 6.15 francs in 1893,⁵² it was still an expensive product. In this respect, perfumery products show a social diffusion more than a real democratization. And, as production costs fell, the sector strengthened its margins even further, thanks to the image of a luxury product it had patiently crafted.

Conclusion

In this respect, the end of the nineteenth century appears to be a crucial time in the evolution of the perfumery market, an age of transition combining unique conditions within the industry and the marketplace favourable, as I demonstrate, to the emergence of a distinct fashion process for perfumery. Emphasis shifted from the fragrance itself, which remained difficult to diffuse in the cultural context of the nineteenth century, to the display of the discourse that surrounded it. The very beginning of the twentieth century, however, soon found a way to resolve this intrinsic lack of image by linking perfumes to couture houses. This alliance, which was to emerge in the 1910s, strengthened after the the First World War and throughout the interwar years, with perfumes launched by such couturiers as Paul Poiret, Gabrielle Chanel, Jean Patou or Jeanne Lanvin. In their hands, under their names and among their models, perfume then became, in the full sense of the term, a modern fashion accessory.

⁵² E. Levasseur, *Questions ouvrières et industrielles en France sous la troisième République*, (Paris, 1907), p.245, quoted by Rosine Lheureux-Icaire, *Les parfumeurs entre 1860 et 1910*, p.66.

Cultural differences and overseas expansion: British enterprise and attitudes to Balkan Slavs as business partners, 1878-1914

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This paper¹ examines reasons for the comparative lack of British trade and investment in the Balkans (primarily in Serbia and Bulgaria), and investigates British reactions to difficulties in commercial contacts in the region, ultimately considering how the 'commercial aptitude' of Serbs and Bulgarians was regarded by diplomats, merchants, and investors. Economic and financial barriers to British commercial contacts included the comparative expensiveness of British goods – mainly resulting from higher transport costs, and the general British preoccupation to invest within the Empire and in the Americas between 1870 and 1914.² British views were shaped by three mercantile activities: proposals to establish banks and commercial agencies, participation in competitions for government contracts and concessions, and conducting of day-to-day trade. The existence of vast unexploited natural wealth increased post-1880 demand for manufactured goods, relative geographical closeness after improvements in the transport network, and economic growth in the host countries increased British commercial interest towards the Balkans. First, the lack of British investment is examined in the context of foreign capital issues in the Balkans: how far was the absence of British investment explainable by the 'image' of the Balkan Slavs in terms of commercial morality and trustworthiness? Second, the extent to which British unwillingness to invest impeded British firms' ability to obtain lucrative concessions is considered. Finally, the ways in which the encounters of British merchants with local customs authorities shaped British views about Balkan Slavs as trading partners is investigated.

Most banks in Serbia and Bulgaria were established at least partly with foreign capital. British and French investors founded the Ottoman Bank in 1862, when its branches also began to spread into the Balkans, first to Bucharest and Thessalonica. From the mid-1870s, the Ottoman Bank also extended its operations to Bulgaria.³ In Bulgaria, other foreign financed banks were also founded – mostly with French, German and Austro-Hungarian capital.⁴ The Ottoman Bank was also involved in Serbian finances from 1895 onwards, but never opened a branch in the country.⁵ As in Bulgaria, most banks in Serbia were founded with capital from France, but also from Austria-Hungary and Germany.⁶

Given the predominance of London as the financial centre of the world, it was surprising that no banks were founded with British capital in the Balkans. This did not mean that British investors were not keen on the region. Since at least 1857, British investors and engineers were involved in financing the building of railways in the Balkans,⁷ but it was only after 1883, when J.C. Morgan & Co. contemplated the establishment of a British bank in Serbia,⁸ that investors considered engaging

¹ This paper is compiled from a chapter in my thesis which on the whole considers British attitudes towards Balkan Slavs in the context of British imperial culture between 1856 and 1914.

² H. Feis, *Europe, the world's banker, 1870-1914* (New Haven: Yale University Press, 1930), p.23.

³ A. Autheman, *La Banque Imperiale Ottomane* (Paris: Comite pour l'histoire economique et financiere, Ministere de l'Economie et des Finances, 1996), pp.274-5.

⁴ L. Berov, 'Foreign capital in the Bulgarian banking system, 1878-1944-1997', in K. Kostis (ed.), *Modern banking in the Balkans and West-European capital in the nineteenth and twentieth centuries* (Aldershot: Ashgate, 1999), pp.151-6.

⁵ C. Clay, 'The Imperial Ottoman Bank in the later nineteenth century: a multinational 'national' bank' in G. Jones, *Banks as multinationals* (London: Routledge, 1990), p.150.

⁶ A. Mitrovic, 'Foreign banks in Serbia, 1882-1914', in *Modern banking in the Balkans*, pp.76-7.

⁷ J. Lampe & M. Jackson, *Balkan economic history, 1550-1950: from imperial borderlands to developing nations* (Bloomington: Indiana University Press, 1982), p.209.

⁸ Mitrovic, 'Foreign banks in Serbia', p.79.

more British capital in the region. This tendency increased in the early years of the twentieth century. The following outlines the aspirations of various British schemes and offers explanations for comparative lack of British investment in the Balkans. The aim of these undertakings was to provide banking services (primarily to British firms that sought entry to the Balkan markets), to increase British-Balkan trade, to finance and promote British companies, and, ultimately to gain profits by making use of the rich natural resources in the region.⁹ These intentions corresponded with British overseas banks' operations elsewhere in the world.¹⁰

However, most of the proposals ended up dead letters. Three 'non-economic' reasons were evident: negative attitude towards commercial morality of the Balkan Slavs, volatile political situation, and promoters' inability to obtain official backing of the Foreign Office. One British investor who had since 1873 had business contacts in Serbia, stated that he had not been able to find a single 'honourable or respectable lawyer' in the country, and argued that English investors should be 'warned from investing ... one single halfpenny' because in Serbia the 'whole population seems to be bonded together for the purpose of obtaining credit from foreigners only for the purpose of abusing it'.¹¹ The predominance of French capital in the Balkans was illustrated by the contradictory attitudes of London and Paris committees of the Ottoman Bank towards granting credit to Balkan governments. In 1890, when Paris agreed to purchase Serbian stock with 27 million francs, London's allotment was only 3 million, which was later reduced to 2 million.¹² Nine years later, the requested 20 million francs' loan to the Bulgarian government was declined by London, and, they stated that it was 'most undesirable for the Bank to be involved in any way in Bulgarian finance'.¹³ London also refused an advance payment to the Montenegrin government, because the repayment of the previous advance was delayed,¹⁴ and declined the proposed £150,000 loan to the municipality of Belgrade in 1901.¹⁵ The perceived xenophobia of the Balkan Slavs can be regarded as another explanation for the lack of British capital in the Balkans. This attitude had a long history, and was primarily evident in the views of British diplomats. In 1860, the British consul in Belgrade argued that 'such is the jealousy against foreigners' that Serbia did not offer a 'good opening for the capitalist'.¹⁶ Another diplomat argued in 1909 that the 'while desirous of attracting foreign Capital ... the Bulgarians cannot bear to see Foreigners making money'.¹⁷ If stereotype is defined as 'a form of knowledge that vacillates between what is 'in place', already known and something that must be anxiously repeated',¹⁸ these types of views can definitely be seen as stereotypical. In effect, the British believed that 'all Bulgarians were xenophobic' and that 'all Serbs abused foreign investments' and these beliefs certainly decreased British financial interests towards these countries.

To an extent, unpredictable political situations prevented British capital from being introduced in the Balkans. From a theoretical perspective, political risk in international business exists when

⁹ National Archives, Kew, Foreign Office (FO), FO 368/11, Mendelssohn to Petrov, Sofia, 20 April 1906. In addition to Mendelssohn, the establishment of the bank was promoted by a member of the London Stock Exchange Benito Weiser, a well known Cape merchant Fred Puzey, and a London banker John Rodger. FO 368/47, Whitehead to Grey, Belgrade, 12 December 1906; FO 368/126, Anglo-Servian Syndicate to Whitehead, London, 30 January 1907; FO 368/1115, Rodgers to Foreign Office, London, 9 June 1914.

¹⁰ M. Wilkins, 'Banks over borders: some evidence of their pre-1914 history' in *Banks as multinationals*, p.225.

¹¹ FO 105/98, P. Stanhope, 'Memorandum' (1888) in 'Claim of Mr. P. Stanhope against the First Bank of Serbia', vol. 1 (1888-1890).

¹² Guildhall Library (GL), London, Ms 23967/5, Imperial Ottoman Bank (IOB), London minutes, 1888-1897, London, 15 October 1890; 29 April 1891.

¹³ GL Ms 23967/6, IOB, London minutes, London, 1 November 1899.

¹⁴ IOB, London minutes, London, 17 August 1898; 21 June 1899.

¹⁵ IOB, London minutes, London, 9 May 1901.

¹⁶ FO 881/1075, R. Dalryell, 'Report upon the Principality of Servia' (1860), p. 9; Also, FO 881/2539, H. Northcote, 'Servian railway question', 10 February 1873, p. 5; FO 881/6731, Brophy to Nicolson, Varna, 27 July 1895; FO 881/8873, G. Buchanan, 'General report on Bulgaria for the year 1906', (1907), p.8.

¹⁷ FO 368/278, Findlay to Grey, 13 October 1909. Also, FO 371/1304, H. Bax-Ironside, 'Bulgaria - annual report, 1911', (1912), p.10.

¹⁸ H. Bhabha, *The location of culture* (London & New York: Routledge, 1994), p.66.

there are discontinuities in the business environment, when these discontinuities are difficult to anticipate, and when they result from political change.¹⁹ These types of difficulties were evident in British commercial encounters in the Balkans before 1914. In 1894, the fall of Stefan Stambolov's regime in Bulgaria meant that a proposed Anglo-Bulgarian bank was not established because the deal was negotiated with his government.²⁰ The British consul-general in Sofia, argued that the main problem with one British scheme, aimed at founding a bank in Bulgaria, was that it involved the establishment of branches in Macedonia, where the would-be British managers of the bank 'would have to exercise the greatest care in order to prevent their Bulgarian colleagues from using the Bank for political purposes'.²¹ During the First Balkan War in 1912, one British financial house considered taking legal action against the Bulgarian government, but was unable to do so due to the suspension of all civil courts as a result of the declaration of martial law in the country.²² Thus, regime change, fear that British-established banks could be used as political tools, and legal difficulties arising from political instability decreased British investments and other commercial contacts.

Another reason which contributed to the lack of British investment was that promoters of various schemes were severely scrutinized in the Foreign Office and in the Board of Trade – especially if a proposal had foreign connections. The absence of official backing was significant, because it was often difficult to conclude any business arrangements in the Balkans without it. For instance, the British consul-general in Sofia was concerned about one British promoter's connection with the Dresdener Bank, because it 'gave the whole scheme too much of a German character'.²³ When a Paris investment house Gubbay & Co. expressed interest in creating an Anglo-Serbian bank, the British legation, although generally in favour of the idea, was cautious about involving French capital.²⁴ Generally, British diplomats believed that Englishness, respectability, financial stability and local knowledge were the desired characteristics of a good business promoter. The official Britain was, therefore, much more interested in backing schemes promoted by 'respectable Englishmen' than giving support to 'men with doubtful reputations' or 'foreign accents'. This was quite interesting since, as shown above, the British diplomats often accused Balkan Slavs of anti-foreign sentiments. Nonetheless, doubts about commercial aptitude of Balkan Slavs, political risks, and the awareness of probable difficulties in obtaining necessary official backing, reduced British investors' interest towards the Balkans.

Most foreign capital came into the Balkans as state loans.²⁵ The unwillingness of British banks and investors to provide Balkan governments with such loans meant that British firms were unable to acquire government contracts and concessions because public works projects, for instance, which often required a concession, were primarily financed with state loans. According to a 1906 report on Serbian trade, 'deep-rooted mistrust which exists in the United Kingdom with regard to Servian commercial morality and the consequent disinclination to grant credit' was among greatest barriers to the increase of British-Serbian trade.²⁶ The following introduces British views about the inability of British firms to obtain concessions in the Balkans. Despite the general negative view towards Balkan investments, British diplomats often urged investors to abandon their reservations and 'prove more liberal in the matter of credit'.²⁷ These concerns were also voiced by British companies that were willing to do business in the Balkans. Middlemore & Lamplugh stated in 1914 that, in addition

¹⁹ S. Robock, 'Political risk: identification and assessment', *Columbia Journal of World Business*, 7 (1971).

²⁰ Mendelssohn to Petrov, Sofia, 20 April 1906.

²¹ FO 421/259, M. de C. Findlay, 'Bulgaria – annual report, 1909', (1910), p.25.

²² FO 368/659, Bax-Ironside to Grey, 30 October 1912.

²³ Bax-Ironside to Grey, 30 October 1912.

²⁴ FO 881/8963, J. Whitehead, 'General report on the Kingdom of Serbia for the year 1906' (1907), p.6.

²⁵ A. Kostov, 'Western capital and the Bulgarian banking system: late nineteenth century-Second World War' in *Modern banking in the Balkans*, p.61.

²⁶ FO 368/11, 'Report for the year 1904 on the trade of Serbia' (1906), p.16.

²⁷ FO 368/800, Bax-Ironside to Board of Trade, Sofia, 14 May 1913. Also, FO 368/1115, Crackanthorpe to Grey, 27 February 1914. See also, FO 371/1219, C. Barclay, 'Serbia – annual report, 1910', (1911), p.4.

to them, two other Midland manufacturers had tendered for military supplies, but eventually found that 'there had been no prospect from the very beginning of the order being placed with an English firm, owing to the conditions upon which the loan had been negotiated'.²⁸ The importance of British investments to British commerce was, therefore, widely acknowledged, and the lack of it seen as a serious impediment to British trade.

Another factor which was sometimes regarded as a barrier against the ability of British companies to acquire concessions was that the British felt that Balkan businessmen and governments were inexperienced in dealing with the demands of modern commerce. In 1877, in connection with the Waring Brothers' attempt to acquire a concession to build and work the railway in Serbia, the British consul-general argued that Serbian ministers' inability to reach any decisions was mainly due to the 'want of experience in such matters', which caused unnecessary delays.²⁹ The British also believed that they were treated unfairly by Balkan governments who immorally favoured continental firms. The British ambassador in Belgrade argued that this tendency was evident because the continental firms 'were able to obtain the specifications through private channels' before British companies.³⁰ Another complaint was that continental firms were favoured even if British firms had the best offer. In 1910, Vickers Sons & Maxim tendered for the supply of armaments to the Serbian army, and had quoted the lowest price, but nonetheless, the contract went to a German manufacturer. 'The whole system of placing army contracts is rotten', argued the British ambassador, since the department responsible was 'amenable to bribery'.³¹ In sum, the British believed that they were placed into difficult positions because Balkan businessmen and governments were inexperienced, they showed favouritism towards continental firms, and were prone to bribery.

British traders' encounters with customs authorities in Bulgaria undoubtedly shaped British views about Balkan Slavs as business and trading partners. British merchants often complained about the treatment they received, and occasionally, these complaints reflected an ideological conflict between the principles of free-trade and protectionism. This conflict became increasingly apparent after the old Ottoman trade agreements were abolished in Bulgaria and Serbia in the 1880s and 1890s. Prior to this, the Balkan governments had not been able to use protective measures.³² The following investigates British reactions to trade barriers in the Balkans, and examines how these difficulties influenced the ways in which the Balkans Slavs were regarded as trading partners.

British merchants and diplomats often felt that they were treated unfairly in comparison to traders from other countries. An Anglo-Indian company Becker, Gray & Co. argued that they had been subjected to a much higher duty than was the case with similar products from other countries, and because of this 'business will now be quite impossible'.³³ One diplomat's assessment of the Bulgarian customs authorities was a telling example of overall attitudes: 'Indeed, it may be said that the general attitude of the Government in matters relating to the customs is characteristic of the

²⁸ FO 368/1115, Middlemore & Lamplugh to Commercial Intelligence Branch, Walsall, 17 January 1914.

²⁹ FO 78/2643, St John to Earl of Derby, Belgrade, 24 March 1877.

³⁰ FO 881/9467, J. Whitehead, 'Servia - annual report, 1908', (1909), p. 5. Also, FO 368/126, Vulcan Foundry Ltd to Board of Trade, Warrington, 26 February 1907; FO 368/519, Walton, Goody & Cripps to Foreign Office, London 6 May 1911.

³¹ FO 371/1219, C. Barclay, 'Servia - annual report, 1910', (1911), p. 4; FO 371/1742, C. Barclay, 'Servia - annual report, 1911', (1912), p.3.

³² I. Berend & G. Ranki, *Economic development in East-Central Europe in the 19th and 20th centuries* (New York & London: Columbia University Press, 1974), p.88.

³³ FO 368/10, Becker, Gray & Co to India Office, London, 12 March 1906. Also, FO 368/10, Samson & Unna to Dundee Chamber of Commerce, Dundee, 20 March 1906; FO 368/395, E.H. Kannreuther & Co. to Findlay, Birmingham, 12 October 1910; FO 78/ 4139, Richards to Hardinge, Burgas, 2 December 1888; Hardinge to Marquis of Salisbury, Sofia, 7 December 1888. Also, FO 913/17, K. Hazzopulo & Sons, Logios Brothers, Z & A Hazzopulo & Co. to W. Dalziel, Rustchuk, 15 December 1887. Britain and Bulgaria signed a provisional commercial arrangement in December 1889, which was designed to end these types of barriers to British-Bulgarian trade. This arrangement guaranteed most-favoured-nation treatment to both signatories. Most-favoured-nation clause was extended to British colonies and possessions in April 1906. Evidently, however, the legislation did not work in practice.

national reputation for 'hard bargaining'.³⁴ These examples illustrated that commercial difficulties reinforced, but also created stereotypical perceptions of the Balkans in Britain. In addition, British merchants often complained that duties were higher than the expected profits. The export manager of Lever Brothers Ltd. thought that higher duties were 'an unfair attack' on the part of the Bulgarian customs authorities.³⁵ In 1911, Altendorf & Wright informed the Foreign Office that their 'business has come to a sudden stop' owing to the duty increase which meant that it was now 'higher than the value of the goods'. They feared that unless duties were reduced the 'business will be lost to us for ever'.³⁶ Thus, the British felt that protective measures were exclusively directed towards British exporters, and higher tariffs made trade unprofitable.

Political risks also directly affected British trade in the region. In the aftermath of the Serbian-Bulgarian War (1885-6), after which Bulgaria and East Rumelia were united, the customs system created a lot of confusion among British traders and diplomats. They were concerned that goods from the Ottoman Empire, which was a popular route by which British goods entered the Balkans,³⁷ would be subjected to double duties – first on the Ottoman-East Rumelian border, and then on the East Rumelian-Bulgarian border. The British consul-general argued that double duties especially affected British trade because duties on British goods exceeded those 'levied on similar goods of other nations'.³⁸ The declaration of formal Bulgarian independence in 1908 was regarded by the chairman of the Phoenix Assurance Co. as an impediment to British-Bulgarian commerce. He argued that 'politically Bulgaria now considers itself free from any liability towards foreigners' and that unless precautionary measures were taken 'British Companies and firms trading in Bulgaria will be seriously handicapped'.³⁹

At times, these types of difficulties resulted in appeals to free-trade principles. W.H. Davis & Co. complained about duty increases which according to their view did 'very serious damage to British trade', and hoped that the Foreign Office would 'in the interest of Free Trade' obtain an alteration in the duty.⁴⁰ High tariffs were also seen as arbitrary measures which acted as barriers to British trade. One Manchester firm argued that the authorities behaved 'in most arbitrary and unfair way', and that it was the responsibility of the British government to 'protect British trade and shield British subjects from such cynical attacks'.⁴¹ Thus, the British believed that protective measures were principally directed against British exporters, and that political changes created confusion about customs laws, and denied foreign merchants the legal protection that they had enjoyed under capitulations. These difficulties sparked appeals to free trade, but also to protection by British merchants. On the whole, high tariffs were regarded as arbitrary measures which directly held back British trade in the Balkans.

British investors and diplomats believed that the Balkan Slavs were dishonest, unreasonable, incompetent and xenophobic in commercial matters. British firms rarely wanted to involve Balkan businessmen in their ventures, and, even though the importance of having local agents and contacts with local banks was acknowledged, they were often regarded by British firms as fraudulent and unreliable. Furthermore, the perceived anti-foreignism – often regarded as a major part of the 'national character' in the Balkans – was seen as the key factor diminishing the value of the Balkans

³⁴ FO 371/1304, H. Bax-Ironside, 'Bulgaria – annual report, 1911' (1912), p.19.

³⁵ FO 368/11, Lever Brothers Ltd to Board of Trade, Cheshire, 11 August 1911.

³⁶ FO 368/519, Altendorf & Wright to Foreign Office, Birmingham, 12 April 1911.

³⁷ Another popular route was through Bulgarian Black Sea ports of Varna and Burgas.

³⁸ FO 78/3900, Lascelles to Earl of Rosebery, Sofia, 5 March 1886; FO 78/4140, E. Hertslet, 'Commercial relations between this country and Bulgaria' (1888).

³⁹ FO 368/278, Phoenix Assurance Co to Mallet, London, 13 July 1909.

⁴⁰ FO 368/278, Davis to Grey, Birmingham, 11 May 1909; 5 November 1909.

⁴¹ FO 368/394, Logios to Manchester Chamber of Commerce, Ruse, 12 April 1910. Similar cases were reported at the time in Serbia. See also, Whitehead, 'Servia, 1909', p.6; FO 368/174, Ehrenbach, Brumm & Co to Grey, Bradford, 28 March 1908. Also, FO 368/174, Martin to Foreign Office, 29 April 1908; FO 368/278, Brown to Board of Trade, Carlisle, 30 December 1909; G. Macgregor, 'Commercial abuses in Bulgaria' (1909); FO 368/395, Brigg, Neumann & Co to Findlay, Bradford, 1 November 1910.

as an attractive area for investment. Consequently, the lack of British interest in providing Balkan governments with state loans resulted in the inability of British firms to acquire concessions and government contracts which had a negative effect on British trade. British merchants often complained about the 'unfair' treatment they had received in the hands of Balkan customs authorities. This was especially the case from the 1880s onwards when former Turkish trade agreements were abolished, and the Balkan governments were able to use restrictive measures to protect home industries. Sudden duty increases and unexplained fines inflicted on British exporters were regarded by them as 'arbitrary measures', specifically directed against British merchants, which, it was believed, seriously damaged British trading interests in the region, and contributed to the impression of unreasonableness, untrustworthiness and anti-foreignism of the Balkan Slavs. Thus, in addition to economic and financial factors, negative attitudes and political risk importantly contributed to the lack of British commerce in the Balkans, and strengthened already powerful stereotypically pessimistic perceptions.

The organization of merchant empires: a case study of Portugal and England

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Introduction

The choice of how to organize overseas expansion arose when Europeans first began to venture across the seas in the fifteenth century. The goal of every monarch was to profit from overseas possessions. Though the objective was the same, methods of extracting profit differed across countries. England and Portugal offer a classic ‘case study’ of institutional divergence: the Portuguese king opted for a crown monopoly, but the English queen chartered monopoly rights to private agents. My paper provides an economic explanation for why a crown monopoly emerged in Portugal and not in England.

I develop a theoretical model of organizational choice with two parties, each holding a specific asset and cooperating in trade: the king provides protection, and servants provide management skills. For trade to occur capital is needed, which can also be used for non-trade purposes. The party controlling this key asset will dictate the type of organization resulting from the endogenous interaction between the two parties. A crown monopoly emerges if the monarch controls capital and the servants are royal employees. On the other hand, a chartered monopoly will emerge if the servants’ own capital and the king guarantee the monopoly of trade to a private joint stock, offering protection against pirates. The two outcomes may vary in terms of efficiency. I then investigate if the empirical evidence is consistent with the model’s predictions.

Early Entry and No Capital Constraint: the Portuguese Case

I show that the Portuguese monarch was not financially constrained and could therefore take the initiative of overseas exploration. Because data on the early fifteenth century expansion are scarce and spotty, I first present indirect evidence, on the costs and revenues of the Portuguese strategy.

The scattered evidence on the existing literature allows me to show that the human cost of the first battle fought by the Portuguese overseas was fairly lower than what has been estimated: only 2.9 per cent of the Portuguese male labour force was employed in this battle as opposed to 14.15 per cent. The rather small ratio (still likely to be overstated) confirms that Ceuta-1415 did not represent a costly effort for the Portuguese monarch at the time, which legitimates the choice to own the monopoly of trade.

Table 1: *Frequency of Assembly of Cortes from 1385 to 1580*

Time Period	Average interval (years) between meetings
1385 – 1414	1.5
1417 – 1495	3.0
1498 – 1580	9.1

Source: Serrão (1977) for the years of the meetings.

On the revenue side, the king’s political and financial independence that can be gleaned from the records of *cortes*. These were assemblies of the three social groups (nobility, clergy and general estates), with mainly legislative, fiscal and political purposes (De Sousa 1990). If the *cortes* were a constraint on the king, or if the king was financially dependent on taxes raised at this level, then there should be no significant change in the average time between meetings. Table 1 shows the average number of years between the assemblies in the pre-expansion period (late fourteenth and early fifteenth centuries), the early expansion period (fifteenth century) and the late expansion period (sixteenth century).

The increasing time between meetings is revealing of the revenue independence of the monarch, who could take important decisions for the kingdom without the advice, consent, or

funding of those he governed. Since the monarch did not face a capital constraint that could prevent him from supporting the costs of the enterprise, there was no need for a change in the organization of the merchant empire.

After the analysis of the available indirect evidence on the Portuguese king’s financial situation I construct a dataset on (labour and capital) costs and revenues to evaluate the profitability of the early Portuguese expansion.

Since complete wage series for fifteenth century Portugal are not available, I rely on wages for other locations in the same time period (Allen 2001). Using these and the scattered information about the numbers of men involved in battles and exploration voyages (henceforth events), I am able to estimate labour costs for each of the events in the Portuguese fifteenth century expansion. Capital costs are calculated based on labour costs and an estimation of the labour share α . I estimate two α -shares, based on labour and capital costs for Portuguese India ships in 1615 and for American whaling ships in 1859 and assuming a standard cobb-douglas production function. I then assume labour share constant⁴² over the period of analysis and use both α -shares to construct the capital costs for each event. Because $\alpha_{1615} > \alpha_{1859}$, I get higher capital cost estimates in column three than in column two. Even so, the cost numbers are far below the revenue estimates.

On the revenue side I consider three possibilities: locations conquered through military expeditions (Ceuta and other Northern African cities) gave the immediate revenue of looting and eventually some annual revenue in taxes, which is assumed to be negligible; inhabited locations reached for the first time by Europeans (such as the Gold Coast) suitable for trade, offered an annual flow of revenue; and finally the discovery of some remote deserted islands in the Atlantic, such as the Azores, represented the cost of the exploration voyage and the addition of new territory, but no revenue.

Table 2: *Estimated Costs and Revenues of the Early Portuguese Expansion* (in kg of gold)

	Cost			Revenue	Rev./Cost
	Labour	Capital – α_{1615}	Capital – α_{1859}		
1471*	139.5	30.9	166.5	3,620	11.8-21.2
1487	21.7	4.8	25.9	226.3	4.8-8.5
1489	28.7	6.3	34.2	226.3	3.6-6.5
1498	29.7	6.6	35.4	372.6	5.7-10.3

* Military expedition

Table 2 presents some preliminary results for four events.⁴³ The ratio of Revenues to Costs indicates that in each of the events revenues always exceeded costs by a magnitude of at least three, which is evidence that each event was a very profitable enterprise for the Portuguese monarch.

Both the indirect evidence and the constructed estimates indicate that the early expansion process was relatively inexpensive. The choice of the crown to own the monopoly of trade follows therefore the prediction of the model that a non-capital constrained monarch could opt for an organizational structure where he was in charge.

Late Entry and Capital Constraint: the English Case

The addition of new sources of trade in the Far East in the sixteenth century caused a sharp increase in the volume of trade, which was also facilitated by technological evolution in navigation. Between 1500 and 1635 about 7 ships left Lisbon to India on a yearly basis. Moreover, during this period, the size and tonnage of ships increased greatly from 400 tons in the early sixteenth century to 2,000 tons by the end of the century (Boxer 1969).

⁴² By keeping α constant I am not ruling out technological progress, which could be captured by the residual. Moreover, maintaining a constant labour share (at the 1615 level) does not reduce the estimates of capital costs. On the contrary, capital costs during the period of interest are overestimated because if α changed over time, it could only have dropped (and therefore $(1-\alpha)/\alpha$ would be lower in 1415 than 1615).

⁴³ The complete table and the detailed description of the construction of the table can be found in the paper.

Running this enterprise was a very expensive task. To transport this immense volume of products, fleets had to have large cargo capacities. The number of ships rose substantially and so did the associated costs of building, manning, and maintaining these ships. Could the English monarch support these costs around 1600? Table 3 indicates the trends of public finance during the second half of Elizabeth I's reign.

Table 3: *Per year Government Expenditures and Revenues in England (in £1,000)*

	Government expenditures	Government revenues	Balance
1583-85	190	250	60
1592-95	315	339	24
1597-1600	419	382	-37

Source: Goldsmith 1987 (pp.190 and 194).

From a surplus situation before 1585 the royal accounts switched to deficit by the end of the century, due not only to wars, but also to the sharp increase in prices during the sixteenth century.

The deficit per se would not necessarily be a reason not to engage in the exploitation of overseas markets via crown monopoly, provided there was scope for government borrowing and debt issuing. This was not the case in the sixteenth century when the financial system was characterized by the absence of specialized lenders. As a result, government borrowing was at the time a rare event, only to occur sporadically in emergency situations in the form of 'forced loans', usually secured under threat, with highly unpredictable repayment and never in the initial terms (North & Weingast 1989).

Table 4: *Forced Loans by the late Tudors and early Stuarts*

	Amount	Interest rate
1598	£20,000	?
1600	£23,200	?
1604-5	£111,891	10
1611-2	£116,381	10
1617	£96,466	10
1625	£60,000	8

Sources: North and Weingast (1989, p.820); Dietz (1964, p.64).

Table 4 shows the history of forced loans for the late sixteenth and early seventeenth centuries. We now need to see if the amounts attained in this form were sufficient for the crown to undertake the East India trade. For this we turn to the expenses of the East India Company during its first fifteen years – the initial period of renewal of the charter.

Table 5: *Cost of the East India Company voyages in the first 15 years*

	Voyage #	Ships	Cost of ships and victuals	Discounted cost (1601)
1601	1	4	£39,771	£39,771
1604	2	4	£48,150	£36,176
1607	3	3	£28,620	£16,155
1608	4	2	£14,000	£7,492
1609	5	1	£6,000	£2,799
1610	6	3	£32,200	£13,656
1611	7	4	£42,500	£16,386
1612	8	4	£48,700	£17,069
1612	9	1	£5,300	£1,858
1613-16*	10-13	29	£272,544	£75,700
Totals	14	55	£538,385	£227,062

* First joint stock (as opposed to the prior system of separate voyages) effective after 1613.

Source: Hunter (1919, p.291 and 307).

The last column on Table 5 shows the discounted value of the cost of ships and victuals in 1601 pounds sterling. The total discounted (at a 10 per cent annual rate) value sums to £227,062, a value

higher than any amount obtained by the monarch in the form of forced loans. Only after the financial revolution of the 1680s, was tradable public debt created, together with a considerable number of other factors that allowed for long-term government borrowing to unprecedented levels (Dickson 1967).

With public finance in difficulties and no borrowing possibilities, the English crown had to franchise out monopoly rights to the East India Company in 1600, as predicted in the model. The presence of a weak (financially dependent) monarch resulted in the growth of the power of Parliament, the only entity able to check and monitor the chartered monopoly.

Other Countries

Portugal and England were hardly the only European nations to embark on overseas expansion of trade between the fifteenth and eighteenth centuries, and Denmark, France, the Netherlands, Spain and Sweden all entered the overseas expansion sweepstakes.

The analysis of other countries' overseas expansions to the East, provides some hybrid cases. In Denmark, France and Sweden, monarchs were financially constrained at the start and according to the model franchised the venture to private agents. The monarchs were however, able to exert royal control over the franchised companies for periods of time. The Netherlands offers an unambiguous case of franchise.

Conclusions

When European overseas expansion began monarchs were faced with a choice of how to organize it – keep control or franchise out. Portugal, the first European power to venture out, chose the first strategy while England chose the second. This paper has presented a model of the decision problem faced by monarchs where the choice of organizational form is determined by surplus division rather than maximization, so that bargaining power matters. If the monarch was not capital constrained (as was the Portuguese case in 1415 and 1498) ownership was the best alternative. Otherwise, the financially constrained monarch would chart away monopoly rights (this was the case of England in 1600, and Portugal in 1587 and 1697). The divergence in market structure choice of the Portuguese and the English merchant empires was therefore economically justified at different points in time.

Some preliminary evidence in favour of the model was presented; in particular, I showed that, in the case of the Portuguese expansion, the necessary investment costs were relatively small compared with the expected returns. But conditions were far different in England. Financially pressed by heavy borrowing used to fight wars, the English monarch franchised out overseas expansion.

The success of the model in rationalizing the choice of form should not be overstated. In particular, when exploring trade from Brazil in the eighteenth century, the Portuguese monarch again chose to keep control. By then, the Portuguese monarch already knew about the success of the European chartered companies and also about the two failed privatizing attempts of Portuguese Eastern trade in 1587 and 1697. A possible explanation is the following: allowing a private monopoly in Portugal would create an alternative source of power, which could eventually challenge the monarch's. To avoid such a possibility the monarch may have stuck to the relatively less efficient institution and still secure some revenue. This interesting question is left for future research.

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Challenging the Old Order: exploring the rise of the engineer in commercial shipping in Britain, Germany and France since 1830

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The hierarchy is a universal concept. Literature on occupational stratification asserts that no society is classless, or unstratified, and that different occupations command varying levels of status. This 'institutionalized inequality' is a device by which societies ensure important positions are filled by qualified persons.⁴⁴ Occupational hierarchies are therefore perpetually (yet often imperceptibly) metamorphosing; reforming in response to changes in society, economy and politics. Consequently, hierarchies are not rigid structures, but processes. Can we therefore see these processes at work? Can we measure them? What are their driving forces? Their products? Their significance?

To understand how the occupational hierarchy is formed and altered, we can assess the case of one occupation. By examining how a new occupation challenges the established hierarchy to ascertain and raise its status, it is possible to identify the generic process by which new economic groups 'challenge the Old Order' of occupations. In theory, this illustrates one life cycle of this process. Arguably the most radical challenge to any modern occupational hierarchy took place following the 'Industrial Revolution'. New technological occupations were forced to forge new paths for themselves, and to challenge the pre-existing order of occupations to assert and elevate their status, and engineering therefore offers an opportunity to study this process from its very beginning. Inevitably for such a large occupation, engineering fragmented into specialized sub-disciplines.⁴⁵ The group to be considered here, are the Marine Engineers employed in sea-going capacity in the British, German and French commercial shipping industries. The history of the sea-going engineer can be traced from 1830, as from this point the application of steam began to increase at sea, and the engineer's economic place within commercial shipping became assured.

These engineers would compete in two hierarchies; firstly within the shipboard hierarchy (their primary reference group being the traditional Deck Officer), and secondly within the wider hierarchy ashore (their primary reference groups being other engineering disciplines, for example, Civil, Mechanical and Electrical Engineers). How these engineers promoted their status provides evidence of the process by which occupations establish their positions within occupational hierarchies in a generic sense, regardless of period, discipline, or nationality. Indeed, gross similarities in occupational hierarchies are accounted for by the uniformities in social structure across societies, whatever the particulars of each society.⁴⁶ Consequently, marine engineering is a microcosm example, indicative of a concept at work in all societies.

The measurement of 'status' is a challenge that has occupied social scientists for decades, with extensive literature produced on this theme. If status can be calculated, it is possible to formulate pictures of occupational hierarchies, as well as understand how these work.⁴⁷ The chosen methodology here is based on the work of A.J. Reiss, and involves assessing the following elements of any occupation:

⁴⁴ K. Davis and W.E. Moore, 'The continuing debate on equality: some principles of stratification', in R. Bendix and S.M. Lipset, *Class, status and power*, Routledge and Kegan Paul Ltd., 1966 pp.47-8.

⁴⁵ R.A. Buchanan, 'The diaspora of British engineering', *Technology and Culture*, 27, 3, July 1986 pp.501-24.

⁴⁶ R.W. Hodge, D.J. Treiman and P.H. Rossi, 'Occupational prestige: a comparative study of occupational prestige', in R. Bendix and S.M. Lipset, *Class, status and power*, Routledge and Kegan Paul Ltd., 1966 p.312.

⁴⁷ D.J. Treiman, 'A standard occupational prestige scale for use with historical data', *Journal of Interdisciplinary History*, 7, 2, Autumn 1976 pp.283-304.

Duties [performed by occupation]

Prerequisites [required of occupation]

Rewards [available to occupation]

Institutional Representation [available to occupation]⁴⁸

Reiss' original theory includes only the first three notions, the fourth is an addition here, institutional representation being a recurring and important theme in literature on occupational status elsewhere. Reiss asserts that as each of these elements rises, the status of the occupation is elevated – however it is crucial to clarify that *all* elements must rise.⁴⁹ Consequently, Reiss' theory will be used to investigate how the status of the Marine Engineer progressed from the early 1800s to the present. By assessing the development of each of the four composite elements of status from 1830, it is possible to see the full spectrum of factors upon which status depends (i.e. both those explicit ways groups consciously act to raise their status, as well as those external forces which act to elevate status). Illustrations from each nation will be used where appropriate, the occupation developing in much the same way and same pace in Britain, France and Germany. Status and hierarchy are one and the same – an increase in status automatically means movement up the hierarchy, which is forced to shift and reform to accommodate this. Reiss' theory therefore allows us to illustrate *how* new occupations establish and elevate their status, and consequently the *process* through which hierarchies are formed and altered.

Let us begin with the first element in Reiss' theory; the duties performed by an occupation.⁵⁰ For the sea-going engineer, duties equate to technology at sea. In the early days of engineering at sea, steam had only a marginal share in terms of tonnage. Early steamers were restricted to short voyages, and were fully masted and rigged in order that they may remain independent of their rudimentary and problematic engines.⁵¹ Although growth of steam in foreign-going trade was steady, (in 1820, 34 steamers were registered, by 1830 this number had risen to 298, rising again by 1841 to 793) steam initially had little impact upon the character of British shipping, and by 1851, 1,227 steamships totalling 187,000 net tons accounted for only a small proportion of Britain's shipping; 24,816 ships totalling 3.5 million net tons still reliant upon sail.⁵² Consequently, the duties of the engineer were minimal in comparison with the traditional Deck Officer.⁵³

However, as confidence in steam grew, and the safety of the boiler improved, engines were adopted into deeper waters. From this point, the responsibility of cargo, crew and ship no longer relied upon wind, current and captain, but engine and engineer. From the early paddle steamer and side lever engine, developments in marine technology gathered pace; the screw in use by the 1830s, compounding and high pressure boilers by the 1870s, followed by turbines in the late 1800s, diesel engines in the early twentieth century, and diesel-electric plant by the mid-twentieth century.⁵⁴ Besides propulsive plant, auxiliary engines were developed for use in all areas; steering gear, heating, air conditioning, refrigeration of cargo, lighting, ventilation, derricks, pumps, stabilisers, navigation and communications.⁵⁵ Throughout the nineteenth and twentieth centuries auxiliary plant

⁴⁸ A.J. Reiss Jr., *Occupations and social status*, The Free Press of Glencoe Inc., 1961 pp.244-8.

⁴⁹ *Ibid.*, pp.244-8.

⁵⁰ *Ibid.*, pp.244-8.

⁵¹ H.C. McMurray, 'The status of sea-going engineers', *Marine Engineers Review*, June 1979 p.14.

⁵² B.R. Mitchell and P. Deane, *Abstract of British historical statistics*, 1962 pp.217-19, cited in H.C. McMurray, 'Technology and social change at sea: the status and position on board of the ship's engineer, circa 1830-60', in R. Ommer and G. Panting (eds), *Working men who got wet: proceedings of the fourth conference of the Atlantic Canada Shipping Project 24 July-26 July 1980*, Maritime History Group Memorial University of Newfoundland, 1980 p.37.

⁵³ *Ibid.*, p.45.

⁵⁴ K. Bösche, et al., *Dampfer, Diesel und Turbinen: Die Welt der Schiffsingenieure*, Convent Verlag, 2005.

⁵⁵ D. Griffiths, *Steam at sea: two centuries of steam-powered ships*, Conway Maritime Press, 1997 p.92.

& *Ibid.*, *Power of the great liners: a history of Atlantic marine engineering*, Patrick Stephens Limited, 1990 p.73.

continually expanded and diversified to meet the ever-growing demands of cargo transportation and passenger comfort, all of which placed increasing emphasis upon the engineer.

Developments in marine technology have historically been adopted simultaneously by leading companies across Europe such as *P&O*, *Cunard*, *CGM*, *CGT*, *Messageries Maritimes*, *Norddeutscher Lloyd* and *HAPAG*. The duties of the sea-going engineer have been dictated by these developments, which in turn have been driven by industrialization, world trade and globalization. The role of the sea-going engineer has then increased dramatically from the 1830s; by the late 1800s he ensured trade to newly industrialized Europe, and in 2005, 95 per cent of UK imports and exports continued to travel by sea, UK ports handling an estimated 555 million tons of goods annually, with 3.8 million passengers travelling from UK ports in the first three months of 2004.⁵⁶ In sociological terms, what we are talking about is the point at which an occupation becomes 'functionally necessary' for a society, i.e. the function of or duties performed by that occupation become important to the running of society (in this case, both shipboard and shoreside societies).⁵⁷ This is an external force which acts to elevate the status of an occupation; it is based on changing economic situations, is out of the control of the occupational members, and is usually the initial catalyst in the establishment of an occupation. In this respect it is arguably the most powerful element of status, and the key factor in hierarchy reformation.

The second element in Reiss' theory regards the prerequisites of an occupation.⁵⁸ These are stipulations industry, government, or other regulatory bodies enforce upon occupations to ensure competence, safety, and accountability. Prerequisites may include education and qualifications, occupation specific training, certification, and licensing. This idea features heavily in both sociological literature on occupational hierarchies, and historical literature on the rise of professionalism.⁵⁹ Engine keepers of the early 1800s had no marine specific qualifications or formal training, and were usually employed on the recommendation of boiler makers and engine works ashore.⁶⁰

However, as boiler pressures increased and the duties of the engineer rose, there were calls for the establishment of governmental regulation.⁶¹ Consequently, across Europe, legislation was introduced and a system of marine specific examinations and class graded certification was imposed in the mid-1800s. In Britain, the Merchant Shipping Amendment Act of 1862 required vessels over 100 horse-power to carry certificated engineers,⁶² whilst records in Bremen show '*Prüfungen der Maschinisten*' dating back to around 1875,⁶³ and in France a similar system was introduced, 3rd Class engineers qualified aboard ships up to 2,500 hp, 2nd Class up to 7,000 hp and 1st Class up to an unlimited hp.⁶⁴ Such licensing imposed by civil authority ensured qualified men were able to shoulder the increasingly onerous responsibilities of the engineer. Training institutions were established, syllabi were amended annually to accommodate technological developments,⁶⁵ and

⁵⁶ 'Ten things you did not know about shipping', Department for Transport, available at: <http://www.dft.gov/stellent/groups/dft_shipping/documents/page/dft_shipping_030880.hcsp> [accessed 9 September 2005].

⁵⁷ K. Davis and W.E. Moore, 'The continuing debate on equality: some principles of stratification', in R. Bendix and S.M. Lipset, *Class, status and power*, Routledge and Kegan Paul Ltd., 1966 p.47.

⁵⁸ A.J. Reiss Jr., *Occupations and social status*, The Free Press of Glencoe Inc., 1961 pp.244-8.

⁵⁹ G. Sutherland, 'Examinations and the construction of professional identity: a case study of England 1800-1950', *Assessment in Education*, 8, 1, 2001 pp.51-64.

⁶⁰ C. Dixon, 'The rise of the engineer in the nineteenth century', in, G. E. Jackson and D. M. Williams, *Shipping, technology and imperialism*, Ashgate, 1996 p.231.

⁶¹ A. Kennerley, 'The education of the marine engineer', *Marine Engineers Review*, January 1979 p.29.

⁶² *Ibid.*, p.29.

⁶³ *Schiffahrt zur See und Prüfungen der Seeschiffer, Seeleute und Maschinisten*, courtesy of Staatsarchiv, Bremen [3-S.2.b, 3-S.4.b].

⁶⁴ *Messageries Maritimes, Recrutement d'un Ingénieur, 2 Mars, 1964*, courtesy of Association French Lines, Le Havre [1997/002/1326].

⁶⁵ H.C. McMurray, 'The status of sea-going engineers', *Marine Engineers Review*, June 1979 p.15.

engineers were required to fulfil practical experience, candidates for the Second-Class 'Ticket' obliged to spend three years in a workshop, as well as one year at sea.⁶⁶ Today in Britain, entry level for acquiring certificated status as a marine engineer is fast becoming a university degree, giving marine engineering a graduate status.⁶⁷

Such formal qualifications allow the adoption of professional titles, and consequently the sea-going 'Engine-keeper', became the 'Marine Engineer' in Britain,⁶⁸ the '*Schiffsmaschinisten*' became the '*Schiffsingenieure*' in Germany,⁶⁹ and in France the '*Officier Mécanicien*' became the '*Ingénieur Mécanicien*'.⁷⁰ The prerequisites of an occupation are therefore integral in raising its status; the greater the duties, the more onerous the prerequisites stipulated, and the more exclusive the membership of the occupation becomes.

The final element in Reiss' theory for calculating status regards the rewards available to an occupation.⁷¹ Stratification in rewards is one of the fundamental and most tangible postulates of occupational hierarchies, and most obvious here is monetary remuneration, although in the case of the sea-going engineer other rewards include accommodation, messing/leisure facilities, uniform, travel allowance, and leave allocation. Here, selected examples from the company records of *P&O*, *Cunard*, *Norddeutscher Lloyd*, and *CGT* (although fragmented) serve to illustrate the changing level of rewards enjoyed by engineers at sea over the period 1830-present.

Although early sea-going engineers commanded good wages, (see table 1) remuneration can be a problematic measure of status, and such favourable figures in fact reflect the low supply and high demand for engineers at sea at this time.⁷² These engineers were accommodated above paddle boxes or machine spaces, Deck Officers retaining the better aft cabins.⁷³ Indeed, although evidence for this early period is sparse, it is thought the engineer's rewards at sea were minimal in comparison with those enjoyed by the Deck Officer.⁷⁴

Table 1: *P&O Oriental, Wage Scales, 1847*⁷⁵

Rank	Pounds per Month
Commander	33-6s
Chief Officer	15
II.	12
III.	9
I. Engineer	25
II.	14
III.	14

⁶⁶ A. Kennerley, 'The education of the marine engineer', *Marine Engineers Review*, January 1979 p.29.

⁶⁷ J. Cowley, 'Engineering and education: a marine engineer's viewpoint', *Trans IMarE*, vol.98, paper 3a, 1986 p.15.

⁶⁸ H.C. McMurray, 'The status of sea-going engineers', *Marine Engineers Review*, June 1979 p.15.

⁶⁹ A. Harms, '*Vom Seemaschinisten zum Schiffsingenieure*', in K. Bösche, et al., *Dampfer, Diesel und Turbinen: Die Welt der Schiffsingenieure*, Convent Verlag, 2005 pp.55-63.

⁷⁰ *L'Officier Mecanicien de la Marine Marchande, Mars 1958, no.4*, courtesy of Centre d'histoire du travail, Nantes [OFF-CGT 28].

⁷¹ A.J. Reiss Jr., *Occupations and social status*, The Free Press of Glencoe Inc., 1961 pp.244-8.

⁷² E. Blackmore, *The British Mercantile Marine*, 1887 p.172, cited in H.C. McMurray, 'Technology and social change at sea: the status and position on board of the ship's engineer, circa 1830-60', in R. Ommer and G. Panting (eds), *Working men who got wet: proceedings of the fourth conference of the Atlantic Canada Shipping Project 24 July-26 July 1980*, Maritime History Group Memorial University of Newfoundland, 1980 p.46.

⁷³ I. L. Button, in 'The development of the merchant ship 1880-1900', *The Mariners Mirror*, 79, 1, February 1993 p.73, cited in C. Dixon, 'The rise of the engineer in the nineteenth century', in G. E. Jackson and D. M. Williams, *Shipping, technology and imperialism*, Ashgate, 1996 p.233.

⁷⁴ H.C. McMurray, 'Technology and social change at sea: the status and position on board of the ship's engineer, circa 1830-60', in R. Ommer and G. Panting (eds), *Working men who got wet: proceedings of the fourth conference of the Atlantic Canada Shipping Project 24 July-26 July 1980*, Maritime History Group Memorial University of Newfoundland, 1980 p.44.

⁷⁵ Wage records for *P&O steamer Oriental*, courtesy of the National Maritime Museum, [P&O/3/1] cited in *Ibid.*, p.46.

However, by the late-nineteenth century engineer's rewards began to rise. In Germany, wages equalled or exceeded those of Deck Officers, despite a good supply of engineers, (see table 2) Engineers gained uniforms like those worn by Deck Officers,⁷⁶ and by 1914 *Norddeutscher Lloyd* allocated engineers the same 'Getränkegeld' per day as navigating officers.⁷⁷ By 1938, *Cunard's* plans for the refurbishment of Captain and Chief Engineer's cabins aboard *Mauretania* included a near identical inventory of furnishings,⁷⁸ and in 1947 *Cunard* allowed 'first class rail travel ... to all certificated engineer officers'.⁷⁹ In France too, records from *Compagnie Générale Transatlantique*, indicate that pre-1950 engineers in the company's service were enjoying parity in rewards with their Deck Officer counterparts, the two for example sharing generous wardroom facilities.⁸⁰

Table 2: *Norddeutscher Lloyd Wage Scales, 1914*⁸¹

Rank	Marks per Month
Kapitän	-
I. Offizier	140
II	105
III.	80
IV.	65
I. Ingenieur	180
II.	130
III.	105
IV.	85

The rewards of the sea-going engineer therefore remained low during the first half of the nineteenth century while the occupation was new and its duties limited. However, these rose from the late nineteenth century in response to the increased duties and prerequisites of the Marine Engineer. Rewards are perhaps the most visible and gratifying element of occupational status, and thus are not only indicators of, but incentives to elevate status. Consequently these are a key driving force in hierarchy reformation.

The fourth and final element of status as set out earlier is absent from Reiss' theory, included here on the basis of its punctuation of literature on occupational status elsewhere. Institutional representation may take one of two forms: trade unionism or professional society.⁸² Certificated engineers in Britain formed a *Marine Engineers' Union* in 1887, with a view to elevating their status (including conditions of service and pay) to equal that of the Deck Officer.⁸³ In addition, the growing standard of professional competence required by Board of Trade certification led to the desire for a professional institution separate from trade unionism as a forum for discussion and dissemination of

⁷⁶ B. Walker, '1884-1977: 93 Jahre Schiffsbetriebstechnik-Ausbildung in Bremerhaven', in '1927-77: 50 Jahre 'Wieland', VDSI Bremerhaven, p.22, courtesy of Deutsches Schiffahrtsmuseum, Bremerhaven [77-3211].

⁷⁷ *Norddeutscher Lloyd Gagen-Etat 1914: Gagen und Sonstige Bezüge auf den Dampfern der Austral-Japan-Linie*, p.2, courtesy of Staatsarchiv, Bremen [7,2010].

⁷⁸ *Cammell Laird* correspondence with *Cunard White Star* regarding refit of *Mauritania*, 21 February 1938, courtesy of University of Liverpool Special Collections and Archives [D42/C3/145].

⁷⁹ *Cunard* Engineer Officers Committee minutes, 8 July 1947, courtesy of Liverpool University Special Collections and Archives [D42/EN/10].

⁸⁰ 'Sondage d'opinion auprès des Etats-Majors des Paquebots sur la question du carré commun', Monsieur Edmond Lanier, Directeur Général *Compagnie Générale Transatlantique*, 20 Octobre 1959, courtesy of Association French Lines, Le Havre [1997/004/5864].

⁸¹ *Norddeutscher Lloyd Gagen-Etat 1914: Gagen und Sonstige Bezüge auf den Dampfern der Austral-Japan-Linie* p.2, courtesy of Staatsarchiv, Bremen [7,2010].

⁸² C.E. McClelland, *The German experience of professionalization: modern learned professions and their organisations from the early nineteenth century to the Hitler era*, Cambridge University Press, 1991.

⁸³ L.D. Trenchard, 'The Institute – past, present and future', *Trans IMarE*, vol.93, 1981, paper 1, p.3 & 'NUMAST family tree', available at: <<http://www.numast.org>> [accessed 25 September 2006].

information, and the *Institute of Marine Engineers* was founded in 1889.⁸⁴ French and German engineers also established representative bodies at this time, French engineers represented by *Le Marin*, and later the *Fédération Nationale des Syndicats d'Officiers Mécaniciens de la Marine Marchande (CGT)*,⁸⁵ and in Germany engineers established *Der Zentralverband der deutschen Seemaschinisten* in 1893,⁸⁶ and later the *Verband Deutscher Schiffs Ingenieure*,⁸⁷ as well as the ÖTV union.⁸⁸ The majority of these continue to exist in the present day, although by different names.

Although fulfilling different roles, both trade union and professional society promote the interests and status of members via government, industry as well as in wider society. Indeed, the constitutional aims of the *IMarE* in 1889 include 'improving of the status of the profession of Marine Engineers',⁸⁹ the *Satzung* of the *VDSI* include '*förderung der gesellschaftlichen und wirtschaftlichen Interessen der Mitglieder*',⁹⁰ and the *CGT*'s resolutions include '*la défense des interest professionnels*'.⁹¹ These support education, provide forums for discussion, and publications for the dissemination of information (*CGT* for example publishing *L'Officier Mécanicien de la Marine Marchande*, and the *VDSI* publishing *Der Schiffsingenieur*).

Literature on the role of trade unionism is extensive, and the professional society is an important feature in literature on the rise of professionalism. Unlike the duties of an occupation, institutional representation is an element members control actively, by establishing it, as well as controlling its membership and the inter-institutional affiliations it cultivates. Such bodies therefore define and promote occupations, and are dynamic tools in the galvanization of members and their drive for status elevation.

Through the example of the marine engineer it has been possible to illustrate the generic factors determining status, through which new and aspiring occupations can elevate their position in the occupational hierarchy. All elements are inextricably linked – one follows as a result of the other, and hence it is a process which will usually take considerable time. As in the case of the Marine Engineer, each of these elements begins low at the dawn of the occupation, and consequently the occupational status is low. Over time however, *if all* elements rise, occupational status is elevated.⁹² Consequently, the hierarchy is altered as a result of this process, and the new occupation (in this case the Marine Engineer) can be said to have successfully 'challenged the Old Order'.

However, *are* these generic factors enough to alter established hierarchies, or are there other long-term and academically elusive issues of *perception* which prevent this becoming reality?⁹³ For

⁸⁴ B.C. Curling, *History of the Institute of Marine Engineers*, Institute of Marine Engineers, London 1961 & L.D. Trenchard, 'The Institute – past, present and future', *Trans IMarE*, vol.93, 1981, paper 1, p.3.

⁸⁵ R.Viaud, *Le Syndicalisme maritime français de les origins à 1950*, University of Rennes, 2002, vol.2, p.425, courtesy of Centre d'histoire du travail, Nantes.

⁸⁶ 'Richard Freese, 1885-1960', Friedrich Ebert Stiftung, available at: <<http://library.fes.de/fulltext/bibliothek/tit00205/00205d06.htm#LOCE9E42>> [20 September 2006].

⁸⁷ F.H., Berg, '*Von der Gründung der ersten Vereine bis 1945*', in K. Bösch, et al, *Dampfer, Diesel und Turbinen: Die Welt der Schiffsingenieure*, Convent Verlag, 2005 p.189

⁸⁸ 'Geschichte und Entwicklung', Ver.di, available at: http://geschichte.verdi.de/quellgewerkschaften/gewerkschaft_oeffentliche_dienste_transport_und_verkehr_oetv [25 September 2006].

⁸⁹ Letter from F.W. Shorey, D. Greer and J.G. Hawthorn to Chief Engineers in port of London, dated 20 November, 1888, regarding proposed establishment of the 'Institute of Marine Engineers', cited in L.D. Trenchard, 'The Institute – past, present and future', *Trans IMarE*, vol.93, 1981, paper 1, p.3.

⁹⁰ *Satzung des Vereins der Schiffsingenieure zu Hamburg (e.V.) 1911*, p.2, courtesy of Deutsches Schifffahrtsmuseum, Bremerhaven [05-487].

⁹¹ *Recueil des Principaux textes législatifs, réglementaires et contractuels relatifs aux conditions d'engagement, de travail, de remuneration et de retraites des Officiers de la Marine Marchande*, Edité par la Fédération Nationale Des Syndicats D'Officiers Mécaniciens de la Marine Marchande, CGT, courtesy of Centre d'histoire du travail, Nantes [CGT-MAR 2L 25].

⁹² A.J. Reiss Jr., *Occupations and social status*, The Free Press of Glencoe Inc., 1961 pp.244-8.

⁹³ A. Inkeles, 'Industrial man: the relation of status to experience, perception and value', *The American Journal of Sociology*, 66, 1, July 1960 pp.1-31

example, despite holding a professional status for over a century, public perception of engineers continues to be characterized by greasy boiler suits. Equally interesting, is an inadvertent product often produced in tandem with the elevation of occupational status. The length of time and galvanization required by this process often enables the construction of defined occupational identities. Literature in this area points to the potency of united and perceived struggle, which can outlive the period of low status, actively remembered through 'communities of memory'.⁹⁴ This phenomenon is evident in the case of British and French Marine Engineers, yet less so in German engineers.

Essentially, this paper has identified and explored a process. Indeed, the way economic groups attain their place in the hierarchy should be of abiding interest. Technological professions such as marine engineering which grew out of the Industrial Revolution may be extreme examples of hierarchy reformation; such an epic shift in the occupational hierarchy will happen infrequently. Nevertheless, the hierarchy will perpetually shift on a smaller scale, via the same generic process.

⁹⁴ I. Irwin-Zarecka, *Frames of remembrance: the dynamics of collective memory*, Transaction Publishers, 1994 pp.49-64.

Why did London become the main money market? Monetary policy, arbitrage and European money market integration in the eighteenth century

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Introduction

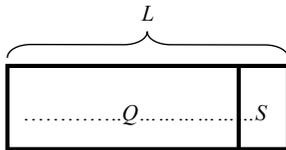
How did the leading capital market start to attract international bullion? Why did London become the main money market?

Monetary regulations, including the charges for minting money and the restrictions on bullion exchange, have played a key role in defining the direction of the flow of international bullion. Countries that abolished minting charges and permitted the free movement of bullion were able to attract international bullion, and countries that applied minting taxes suffered an outflow of bullion. In these cases monetary authorities tried to limit bullion movement through prohibition on domestic bullion exchange at a free price, and tariffs and quantitative restrictions on bullion exports.

The paper illustrates the logic of international monetary flow in the eighteenth century, using empirical evidence for England, France and Spain. The first section defines and measures monetary policy, and the second section introduces minting charges into the arbitrage equation in order to explain the logic of bullion flow between the following pairs of nations: England-France, England-Spain and France-Spain. The conclusion emphasizes the importance of monetary policy in the creation of leading money markets.

What did monetary policy mean in early modern ages?

In commodity money systems, alterations in minting charges known as seigniorage represent monetary policy. Models for measuring seigniorage were pioneered by Cipolla (1982), and recently developed by Sussman (1993), Rolnick, Velde & Weber (1996) and Redish (2000). I measure monetary policy as follows:



Suppose we have one ingot of pure metal (gold or silver) denoted by L .

Then:

Q denotes the quantity of metal in coins received by the owner of the ingot L .

S denotes the quantity of the ingot retained by the mint in the minting process.

An accounting standard P defines value for the physical quantity of metal:

$$L \cdot P = Q \cdot P + S \cdot P = ME \tag{1}$$

Mint Equivalent (ME) is the mint value of the quantity of coins received by the owner of the ingot (Q) plus the quantity of coins retained by the mint (S)

$$Q \cdot P = MP \tag{2}$$

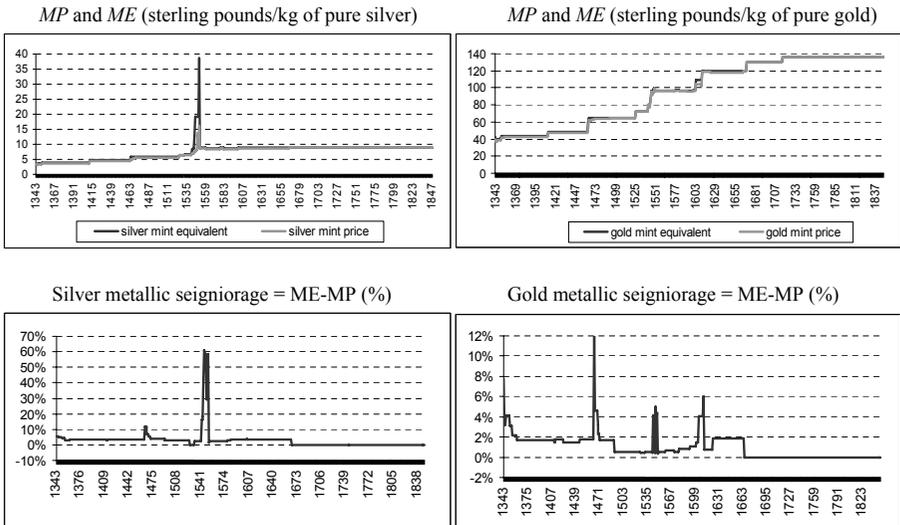
Mint Price (MP) is the mint value of the quantity of coins received by the owner of the ingot (Q)

Graphs 1-3 summarize monetary policy in England, France and Spain in the very long run. I homogenized data for comparing results: L is one kilogram of pure metal, and P is sterling pounds for England, *livre tournois* for France and *maravedis* for Spain.

The simultaneous increments of *MP* and *ME* represent nominal debasements (devaluations), that is, increments of the accounting standard *P*; and the increase in the gap between *MP* and *ME* represents metallic debasement, that is, increase in seigniorage charges *S*.

Graphs 1-3 show the relative stability in nominal debasement in the eighteenth century compared to previous periods. However, there were notable differences in metallic debasement among countries. England abolished seigniorage in 1666, France applied seigniorage taxes of around 5 per cent for silver and 6 per cent for gold for most of the eighteenth century, and Spain increased silver seigniorage charges to 14 per cent and gold seigniorage tax from 2 per cent to 6 per cent during the century. The following section demonstrates the effect of these differences in seigniorage on bullion flow.

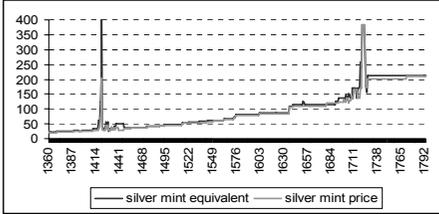
Graph 1: *English Monetary Policy, 1343-1848*



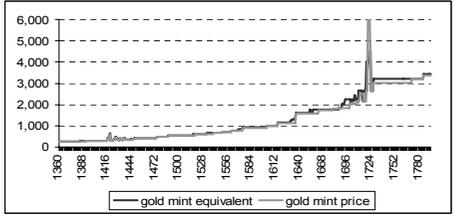
Source: Redish (2000), pp.89-92.

Graph 2: French Monetary Policy, 1360-1793

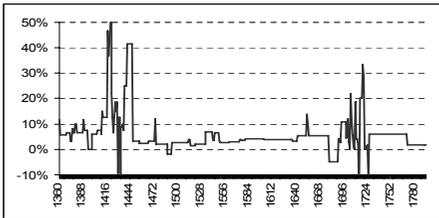
MP and ME (livre tournois/kilogram of pure silver)



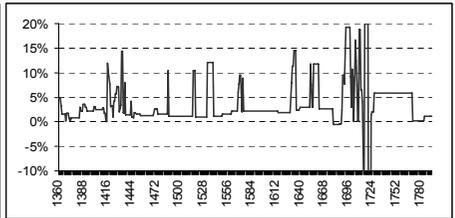
MP and ME (livre tournois/kilogram of pure gold)



Silver metallic seigniorage = ME-MP (%)



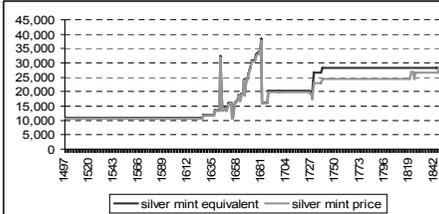
Gold metallic seigniorage = ME-MP (%)



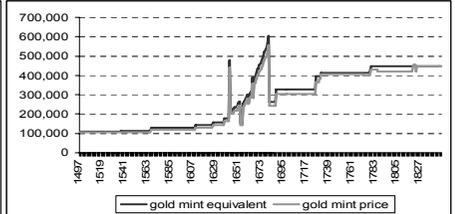
Source: Redish (2000), pp.93-7.

Graph 3: Spanish Monetary Policy, 1497-1848

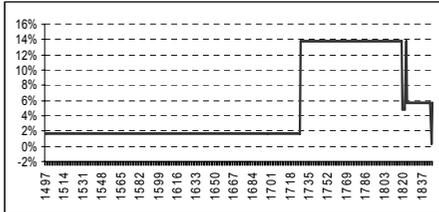
MP and ME (maravedis/kilogram of pure silver)



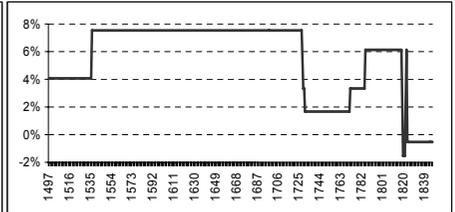
MP and ME (maravedis/kilogram of pure gold)



Silver metallic seigniorage = ME-MP (%)



Gold metallic seigniorage = ME-MP (%)



Sources: calculated in accordance with Spanish legislation: *Recopilación de las Leyes de Indias* (1681), *Códigos Españoles concordados y anotados-Nueva Recopilación* (1851) and *Reales Decretos-Colección Legislativa de España* (1814-1848) (*Biblioteca Nacional de España*).

The law of one price for measuring bullion flow

The single arbitrage equation measures bullion flow between two countries A and B for a metal i (Flandreau, 2004, p.59):

$$(1 - c_i^{AB}) \frac{P_i^A}{P_i^B} \leq X^{AB} \leq (1 + c_i^{AB}) \frac{P_i^A}{P_i^B} \quad (3)$$

where i denotes metal i (gold or silver); P_i^A is the price of metal i in market A ; P_i^B is the price of metal i in market B ; X^{AB} denotes the spot exchange rate between A and B ; and c_i^{AB} is the cost of trading bullion between both markets.

Then, if $(1 - c_i^{AB}) \frac{P_i^A}{P_i^B} > X^{AB}$, exporting metal i from country B to A is profitable; and if

$$(1 + c_i^{AB}) \frac{P_i^A}{P_i^B} < X^{AB}, \text{ exporting metal } i \text{ from } A \text{ to } B \text{ is profitable.}$$

Neal & Quinn (2001) have focused on information and transaction costs (c_i^{AB}) as the variable which explains arbitrage in the eighteenth century. But, in that period, at equal cost, bullion flow was profitable from one country with a seigniorage tax and to another without seigniorage. Therefore, the countries that eliminated seigniorage first attracted international bullion, leading to the creation of money markets. Differences in costs started to assume a key role in bullion arbitrage only when all countries had abolished seigniorage.

For the purposes of this demonstration, I do not take into account the costs in equation (3) and focus directly on the Law of One Price, which measures gross profit:

$$\text{Law of One Price: } \frac{P_i^A}{P_i^B} = X^{AB} \quad (4)$$

I define both variables, $\frac{P_i^A}{P_i^B}$ and X^{AB} , for a system that includes seigniorage:

What were bullion prices in a system with seigniorage? $\left(\frac{P_i^A}{P_i^B} \right)$:

Bullion exchange at a free price was illegal in systems with seigniorage taxes, in order to force agents to sell bullion exclusively in mints and thus to maximize revenue. Only when seigniorage had been abolished in England did bullion start to trade at a free price, under the condition that it had been stamped in the Goldsmith's Hall. In France free bullion trade was forbidden until the Revolution and in Spain until the monetary reform of 1848.

Bullion prices in eighteenth century France and Spain are thus Mint Prices, and the Mint Price for England in the eighteenth century represents the minimum market price, because if the market price falls below the Mint Price it becomes more profitable to buy metal at its market price and have it minted (Flandreau, 2004, p.30). Then, I consider:

$$P_i = MP_i \quad (5)$$

where MP is the Mint Price defined in equation (2).

Results represent the minimum gross profit for exporting bullion to England.

What was the spot exchange rate in a system with seigniorage? (X^{AB}):

The spot exchange rate is the relative spot market value between two accounting standards defined in bills of exchange, which fluctuates around the legal par. The legal par is fixed by the Mint Equivalent relative values defined in equation (1).

Therefore, in a system without seigniorage, the exchange rate fluctuated around the Mint Equivalent ratio:

$$X^{AB} = \frac{ME^A}{ME^B} (1 \pm x) \quad (6)$$

where x measures the fluctuation, that is, the gap between the Mint Equivalent par and the exchange rate value.

The exchange rate is defined in the unit of account. Mint Equivalent par is the relative proportion of the metal contained in the two coins measured at the domestic unit of account. So, in a bimetallic system with seigniorage, what is the Mint Equivalent: gold or silver?

- if seigniorage charges for gold and silver are proportional in both countries:

$$\frac{MP_g}{MP_s} = \frac{ME_g}{ME_s}, \text{ where index } g \text{ denotes gold and index } s \text{ silver,}$$

that is, the bimetallic ratio for bullion (MP_g/MP_s) maintains the same proportion as the bimetallic ratio of coins (ME_g/ME_s), so the Mint Equivalent par for gold and for silver coincides. Mint Equivalent par in a system with proportional seigniorage is equal to that of Mint Equivalent par in a system without seigniorage (equation 6).

- but, if seigniorage charges for gold and silver are not proportional in one country, then:

$$\frac{MP_j}{MP_i} = \frac{ME_j - S_j}{ME_i - S_i} < \frac{ME_j}{ME_i} \text{ where } j \text{ denotes the metal with a higher seigniorage tax } (S_j > S_i)$$

So the bimetallic ratio for ingots is smaller than for coins, so coin j is overvalued in regard to coin i . According to the standard definition of Gresham's Law, bad money – overvalued money – drives out good money – undervalued money – and therefore the exchange rate fluctuates around the overvalued coin par (coin with a higher seigniorage tax).

Thus equation (6) can be rewritten for the specific gold and silver Mint Equivalent pares, supposing no-proportional seigniorage in country B:

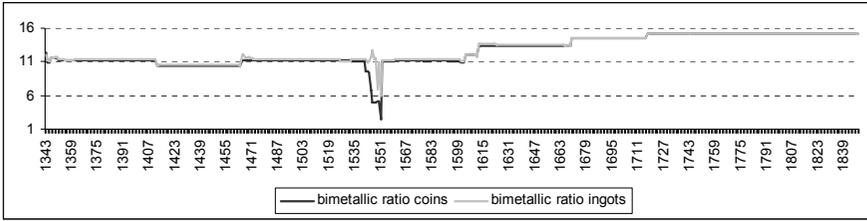
$$\left\{ \begin{array}{l} X^{AB} = \frac{ME_i^A}{ME_i^B} (1 \pm x_i) - \left(\frac{ME_i^A}{ME_i^B} - \frac{ME_j^A}{ME_j^B} \right) \\ X^{AB} = \frac{ME_j^A}{ME_j^B} (1 \pm x_j) \end{array} \right\} \forall S_j^B > S_i^B \quad (7)$$

where $\left(\frac{ME_i^A}{ME_i^B} - \frac{ME_j^A}{ME_j^B} \right)$ is the premium for the undervalued coin.

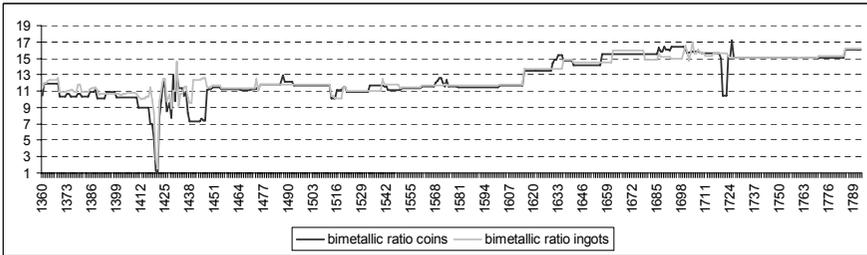
If $S_j^B = S_i^B$, premium is zero; so equation (6) is a restriction on equation (7) when seigniorage is proportional ($S_j^B = S_i^B$) or when there is not seigniorage ($S_j^B = S_i^B = 0$).

Graph 4 shows long-term legal bimetallic ratios for England, France and Spain. England kept silver coins overvalued until the abolition of seigniorage in 1666, France alternated periods of gold and silver overvaluation, and Spain overvalued gold until the reform of 1728, when it started to overvalue silver.

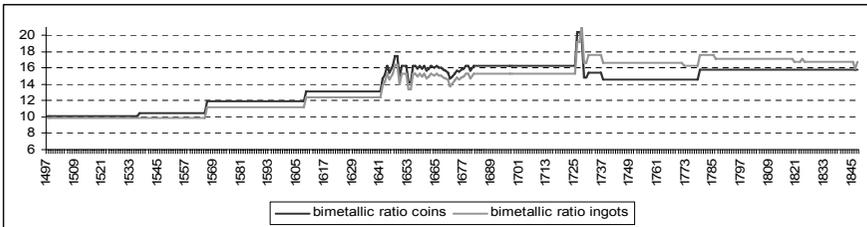
Graph 4: Bimetallic ratios
Bimetallic ratio in England (1343-1847)



Bimetallic ratio in France (1360-1793)



Bimetallic ratio in Spain (1497-1847)



Sources: see graphs 1-3.

Price convergence measures integration. The Law of One Price for metal i is the indicator of money market integration between two countries:

-if there is no seigniorage, combining equations (4) + (5) + (6):

$$\frac{MP_i^A}{MP_i^B} = \frac{ME^A}{ME^B} \rightarrow \frac{MP^A}{MP^B} \approx \frac{ME^A}{ME^B} (1 \pm x) = X^{AB} \quad (8)$$

the Law of One Price is in balance, and the bullion market for metal i is integrated between countries A and B . In this model only a fluctuation in exchange rate (x) creates opportunities for arbitrage.

-but, if there is seigniorage in country B, combining equations (4) + (5) + (7):

$$\left. \begin{aligned} \frac{MP_i^A}{MP_i^B} = \frac{ME_i^A}{ME_i^B - S_i} > \frac{ME_i^A}{ME_i^B} - \left(\frac{ME_i^A}{ME_i^B} - \frac{ME_j^A}{ME_j^B} \right) \pm \frac{ME_i^A}{ME_i^B} x = X^{AB} \\ \frac{MP_j^A}{MP_j^B} = \frac{ME_j^A}{ME_j^B - S_j} > \frac{ME_j^A}{ME_j^B} \pm \frac{ME_j^A}{ME_j^B} x = X^{AB} \end{aligned} \right\} \forall S_j > S_i \quad (9)$$

the Law of One Price is out of balance, and the bullion market between countries A and B for metal i is not integrated. In this case arbitrage from B to A is always profitable, even if there is no fluctuation in the exchange rate ($x=0$). Seigniorage (S_j) makes arbitrage profitable for overvalued metal j and seigniorage (S_i) plus premium $\left(\frac{ME_i^A}{ME_i^B} - \frac{ME_j^A}{ME_j^B}\right)$ makes arbitrage profitable for undervalued metal i .

Graphs 5-7 show results for the Law of One Price for the pairs London-Paris, London-Cadiz and Paris-Cadiz.

MP_i data is taken from data in graphs 1-3.

Contemporaries registered exchange rate data only at two months maturity (A^{AB}) for the whole sample.¹ Spot exchange rate (X^{AB}) should be deduced according to capitalization of the value (Flandreau *et al.*, 2006, p. 20):

$$A^{AB} = X^{AB} \left(1 + \frac{1}{6} r_B\right), \text{ where } A^{AB} \text{ and } X^{AB} \text{ are measured in } \left[\frac{\text{coinA}}{\text{coinB}}\right] \quad (10)$$

and r_B is the interest rate in country B.

But r data is not available for the whole sample. Therefore, two months maturity exchange rate (A^{AB}) is used, which means the cost of the time spent on arbitrage operation is taken into account. Pure gross profit, therefore, is not being compared, but the prices between the two mints, including the time required to move the bullion from one country to the other. Calculations start from the first year when exchange rate is available.

Combining equations (9) + (10):

$$\frac{MP_{i,j}^A}{MP_{i,j}^B} = \frac{ME_{i,j}^A}{ME_{i,j}^B - S_{i,j}} > \frac{ME_{i,j}^A}{ME_{i,j}^B} - \left(\frac{ME_{i,j}^A}{ME_{i,j}^B} - \frac{ME_j^A}{ME_j^B}\right) \pm \frac{ME_{i,j}^A}{ME_{i,j}^B} x = A^{AB} \quad \forall S_j > S_i \quad (11)$$

Graphs 5-7 show gross arbitrage profits caused by disintegration of the Law of One Price (equation 11). Gross profit is divided into the two reasons for disintegration: seigniorage and premium. Seigniorage profit for metal i,j measures gross profitability caused by $S_{i,j}$ effect, supposing the exchange rate fluctuates around the band of metal i,j respectively, and premium profit for metal i,j measures gross profitability caused by premium effect when the exchange rate for metal i fluctuates around band j , whether it is $S_j > S_i$.

Graph 5 shows arbitrage results for London-Paris (1663-1793). Before England abolished seigniorage, France was exporting silver and importing gold, and when England eliminated seigniorage in 1666, France continued importing gold because of its negative seigniorage tax (?), that is, a subsidy for gold coinage. In the eighteenth century (1725-92), after the Mississippi bubble and the stabilization of the *livre tournois*, France started to export both gold and silver, until the Revolution.

Graph 6 shows arbitrage results for London-Cadiz (1681-1847). Cadiz exported both gold and silver to London. Silver arbitrage in the seventeenth century responded to the gold premium, and in the eighteenth century to seigniorage tax. Gold arbitrage responded to seigniorage tax, and when seigniorage tax was reduced (1731-86), it basically responded to the silver premium.

Graph 7 shows arbitrage results for Paris-Cadiz (1763-76). Cadiz exported both gold and silver to Paris. Silver arbitrage was originated by the seigniorage tax. Gold arbitrage from Cadiz to Paris was profitable from 1763-71, although seigniorage was higher in France than in Spain, because

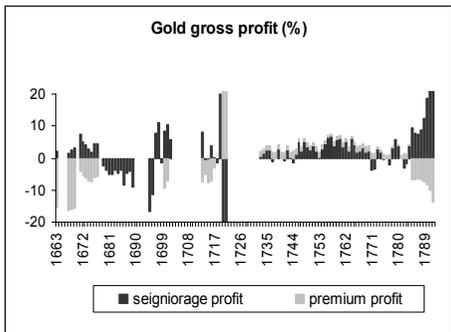
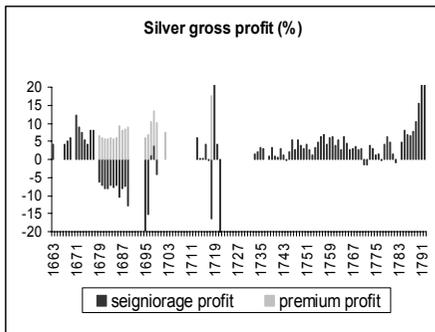
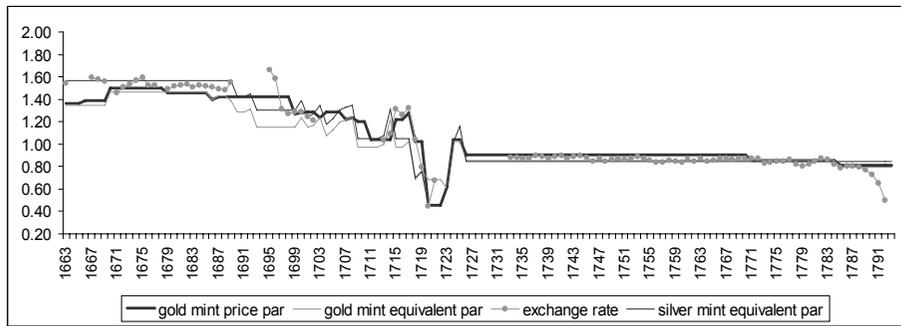
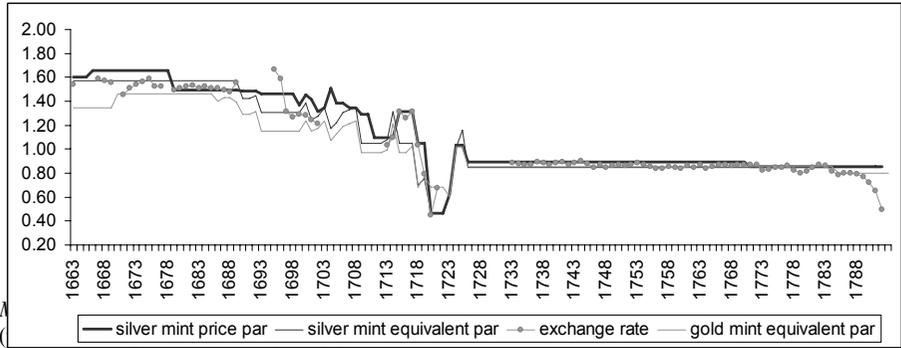
¹ Data of exchange rate in London on Paris and Cadiz in ‘The Price of Merchandise in London’, (*Nederlandsch Economisch-Historisch Archief*), The Course of the Exchange and Lloyd’s List (British Library), and data of exchange rate in Paris on Cadiz in *Affiches* (*Bibliothèque Nationale de France*). Results are calculated using annual average monthly observations.

of the silver premium. From 1771 to 1776, gold arbitrage was profitable because France reduced gold seigniorage.

Gross profitability gives us an idea of the geography of arbitrage in the eighteenth century. Spain exported bullion to France and England, and France exported bullion to England. Spain was a net exporter, a system only sustainable without suffering a ‘money famine’ because it was a productive country. France was a bullion importer from Spain and an exporter to England, and England was the net receiver of gold and silver, which made London the main money market.

Graph 5: Silver and gold arbitrage between London and Paris (1663-1793)

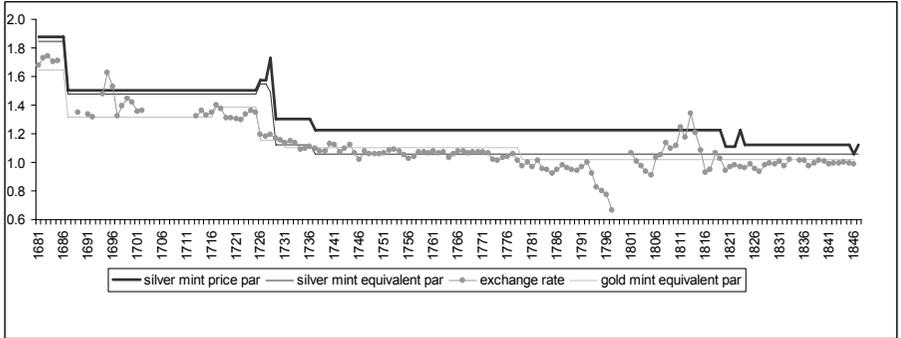
MP par, ME par and exchange rates (pounds sterling/livre tournois per kg silver – data normalized at 0.05=1)



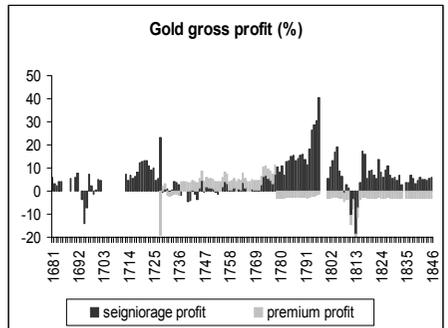
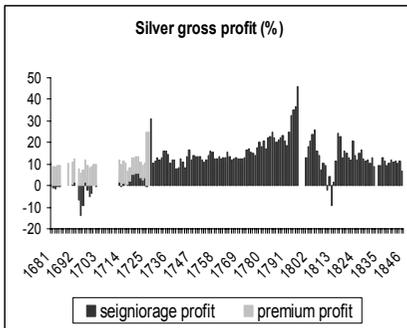
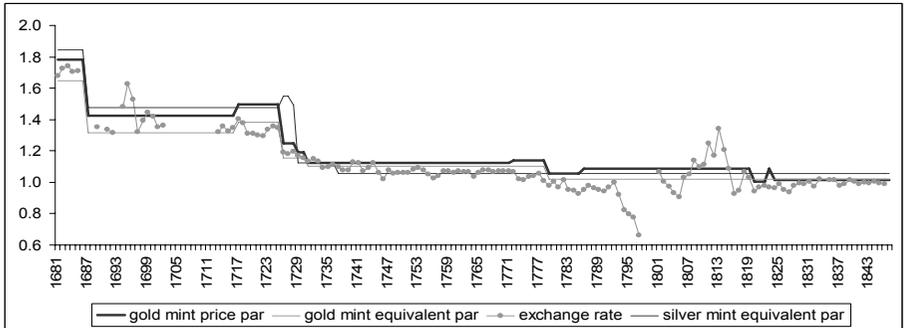
Sources: see text.

Graph 6: Silver and gold arbitrage between London and Cadiz (1681-1847)

MP par, ME par and exchange rates (pounds sterling/maravedis per kg silver – data normalized at 0.0003=1)



MP par, ME par and exchange rates (pounds sterling/maravedis per kg gold - data normalized at 0.0003=1)



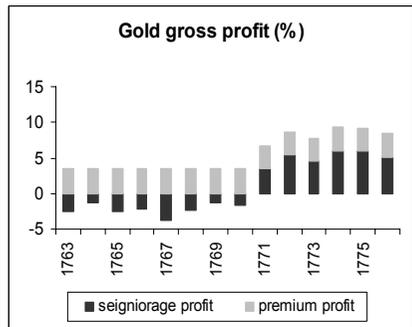
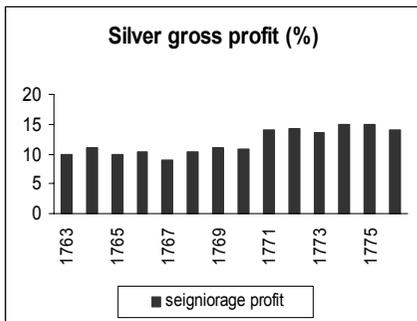
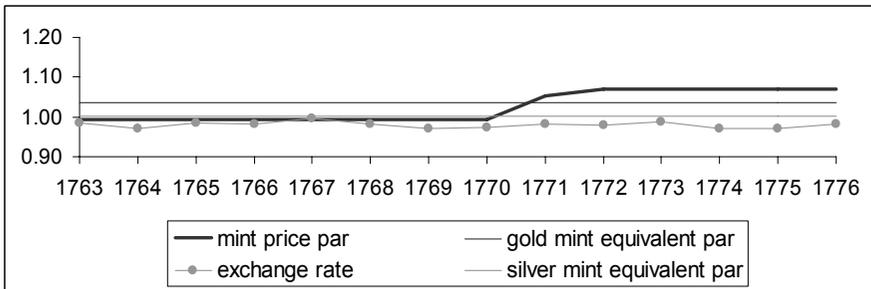
Sources: see text.

Graph 7: Silver and gold arbitrage between Paris and Cadiz (1763-76)

MP par, ME par and exchange rates (*livre tournois/maravedis* per kg silver – data normalized at 0.0075=1)



MP par, ME par and exchange rates (*livre tournois/maravedis* per kg gold – data normalized at 0.0075=1)



Sources: see text.

Conclusion

How did the leading capital market start to attract international bullion? Monetary policy is the key element for explaining international bullion flow in the eighteenth century. In the terms of Obstfeld's open macroeconomy *trilemma* (1998, pp.14-5): 'a country cannot simultaneously maintain fixed exchange rates and an open capital market while pursuing a monetary policy oriented toward domestic goals'. Countries that applied high seigniorage taxes suffered imbalances in the Law of One Price, which caused bullion outflow. Monetary authorities tried to limit bullion movement through the prohibition of domestic bullion exchange at a free price, and tariffs and quantitative restrictions on bullion exports, which in turn led to smuggling. Illegal bullion outflow created an

external bullion market for countries with relative higher seigniorage tax, and countries that abolished seigniorage attracted international bullion. Empirical evidence for England, France and Spain in the eighteenth century shows that seigniorage was higher in Spain than in France, and higher in France than in England. Consequently money markets were not integrated, and bullion moved from Spain to France and England, and from France to England. England was the net receiver of bullion and that was where the leading money market was established.

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East India Bonds, 1718-63: early exotic derivatives²

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Introduction

Were eighteenth century financial markets efficient? Neal (1990) shows that the London and Amsterdam markets were integrated. Yet Dickson (1967), in his landmark opus on the English financial revolution, where he studied the yields on private short-term debentures – the ‘India bonds’ – and on English government bonds, concluded that the different segments of the English domestic financial market were not integrated. In this paper, we demonstrate that this conclusion was incorrect. After examining certain features peculiar to India bonds overlooked by previous authors, we make it clear not only that eighteenth century investors were already proficient in international arbitraging, as Neal indicates, but also that they were capable of handling sophisticated options, well before the rise of modern financial mathematics and Black and Scholes’ (1973) groundbreaking contribution to options theory.

1. No domestic arbitraging on the London market?

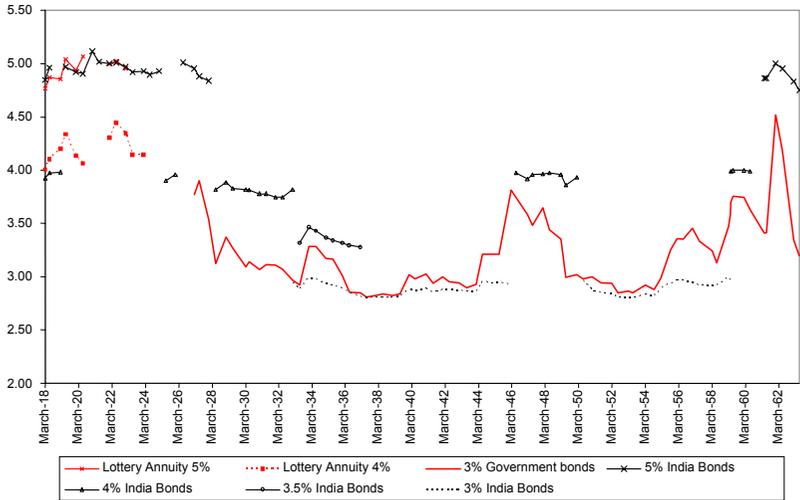
In his 1967 work, Dickson draws a graph showing the India bond yields at various coupon rates, and the yields on 3 per cent government bonds from 1688 to 1756, based on quotes extracted from *The Course of the Exchange*. He obtains a chart very similar to diagram 1 below and concludes that the English domestic market was segmented.

Diagrams 1 and 2 below are quite surprising for, according to the arbitrage equation, the yields of the India bonds of different coupon rates should be identical, since the borrower and hence the risk is the same. Prices should therefore adjust to equalize the yields. This should provoke ‘jumps’ in the price curve and smooth the yield curve when coupon rates change. The exact opposite is the case: the India bond yield jumps by steps when the coupon rates change, while the price continues to develop smoothly. What is more, in periods when India bonds with different coupon rates were in circulation at the same time (as from 1733 to 1737, for example), the yields of the different coupons were also different.

In the next part, we show that these oddities are due to an incorrect understanding of India bonds and to the application of an erroneous formula for calculating their yield.

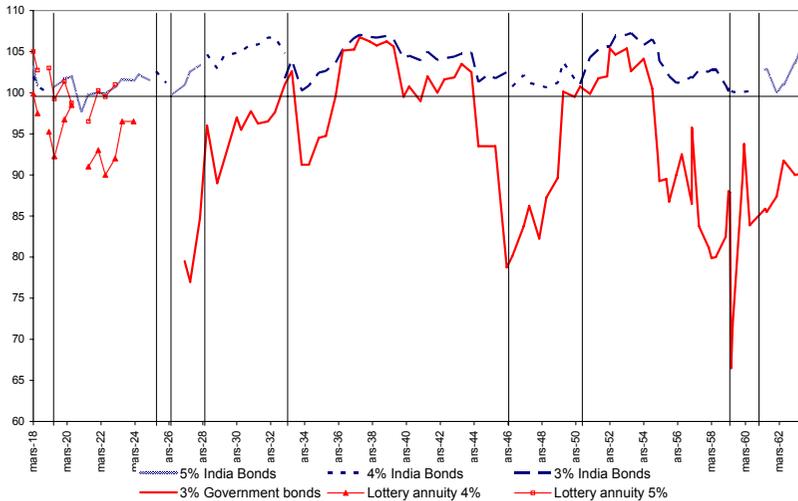
² This is a summarized version of our article: ‘East India Bonds, 1718-1763. Exotic Derivatives, Efficiency, and the Financial Revolution’, available on:
http://www.financesinternationales.sciences-po.fr/fichiers_articles_doctorants/india_bond.pdf

Diagram 1: Yields on India bonds and Consols, 1718-63 (%)



Source: The Course of the Exchange, Lloyd's List.

Diagram 2: Trends in Consol and India bond prices, 1718-63



Source: The Course of the Exchange, Lloyd's List.

2. India bonds, forerunners of ‘callable/putable’ bonds

What is the reason for the odd behaviour of India bond yields as seen in diagram 1? Reading contemporary authors such as Massie (1750) and contemporary trading manuals such as Mortimer (1761), we came to the conclusion that India bonds are nominally a short-term debt, but actually a long-term one with a call and put embedded options.

In exchange for the long-term loans made available to the government, the government allowed the East India Company to issue debentures, the India bonds. But in practice, although the bonds were nominally short-term, they were kept in circulation beyond their maturity date. Once the date was past, the Company could buy back the bonds at their nominal value. If the coupon was down-valued, investors could choose whether to hang on to their bonds and accept the lower rate, or redeem their bonds at their nominal value. In practice then, these securities were long-term bonds carrying what we would now call a call (or conversion) option, exercisable twice a year when the coupons became payable.

In the trading manuals of the day, we read that the holder of one of these securities could at any time use them at their nominal value to purchase merchandise from the Company. If contemporary investors had regarded them as short-term debt, there would have been no reason for this clause to exist, since in any event the investors would have been repaid at maturity date. It is clear then that India bonds were looked upon more long-term than short-term securities and this feature represents what we would call today a put option.

Thus, although India bonds were nominally short-term securities, in practice they very much resemble what are nowadays known as bonds with embedded call and put options, or callable/puttable bonds, i.e. bonds which could be bought back by the Company at six months' notice (call option) or resold by investors to the Company at nominal value with six months' interest twice a year at coupon payment time (put option). It is unfortunately impossible to derive a mathematical formula to price this type of bonds. Still, we can perform a graphic analysis so as to understand how these bonds work.

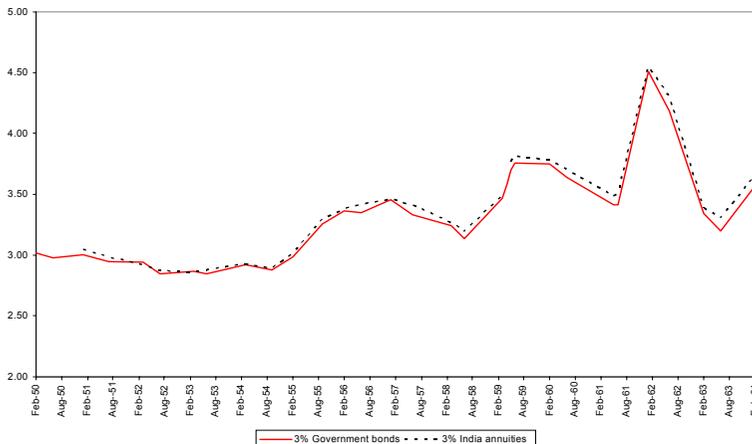
3. Effect of put and call options on India bond prices: graphic analysis

3.1 The relation between Consol and optionless India bond prices

Without options, India bond prices should parallel Consol prices. Indeed, India bonds were debentures issued by the East India Company as a counterpart for loans made to the government. They were therefore in a sense 'secured' by debts due from the government to the Company.

From 1750, the East India Company issued a long-term bond without options, the India annuity. The graph below shows that the yield on these 3 per cent India annuities and on 3 per cent Consols was the same over the period 1751-63. As the two securities are perfectly comparable, it may be deduced that the investors' perception of risk on the India bond and Consols was identical.

Diagram 3: Yields on 3% India Annuities and 3% Consols, 1751-63 (%)



Source: The Course of the Exchange and Lloyd's List.

Since, to our knowledge, no major institutional change in the relations between the East India Company and the government occurred between 1718 and 1751, we conclude that the risk on East India Company debts was the same as that on government debts over the whole period 1718-63. In other words, if the East India Company had issued long-term bonds without options prior to 1750, their prices would have followed the same course as those of government bonds.

This point is essential: accepting as given that the Consol price corresponds to the price that India bonds would have had if they did not contain options, we can by subtraction determine the value of the options in relation to the Consol price and, hence, the price behaviour of India bonds with options.

Without options, we could thus rewrite equation (2) as:

$$P_{ib,3\%} = \frac{3}{4}P_{ib,4\%} = \frac{3}{5}P_{ib,5\%} = P_{c,3\%}$$

where $P_{c,3\%}$ is the price of Consols and $P_{ib,3\%}$, $P_{ib,4\%}$, $P_{ib,5\%}$ are the prices of India bonds without options at different coupon rates.

Viewed graphically, the 3 per cent India bond price in relation to the prices of 3 per cent Consols should lie on a 45° diagonal line. With higher coupon rates, arbitrage imposes a higher India bond price for each Consol price (see equation 3).

3.2 The relation between Consol price and India bond price

Intuitively, we should expect that the put and call options embedded in India bonds would prevent the bonds' price from diverging from the nominal value since, if the price fell too far, investors would be tempted to exercise their option and exchange their bonds for goods or cash at nominal value. The Company would then have to issue bonds at a higher coupon rate. If, on the other hand, the price rose too much, investors would anticipate that the Company would use its buy-back right to convert its debt at a lower coupon rate.

We have seen that India bonds were the equivalent of long-term bonds with put and call options. The 3 per cent India bonds seem, however, to have been in a slightly different class. The government issued annuities at a 3 per cent coupon rate, which was considered very low at the time. It is therefore unlikely that the East India Company would have exercised a call on 3 per cent India bonds and reduced their coupon rate to 2 per cent. We therefore assume that the minimum coupon rate for all debts was 3 per cent and that the 3 per cent India bonds had a put option only, and not a call one.

As a call option is disadvantageous to investors, it drags down the India bond price. On the contrary, the put option is good for them and so adds to the price. The call and put values depend on the price of 3 per cent Consols. The 3 per cent India bond price is written as follows:

$$P_{ib,3\%}^p(P_{c,3\%}) = P_{c,3\%} + VP_{3\%}(P_{c,3\%})$$

and the 4% India price as:

$$P_{ib,4\%}^{c,p}(P_{c,3\%}) = \frac{3}{4}P_{c,3\%} + VP_{4\%}(P_{c,3\%}) - VC_{4\%}(P_{c,3\%})$$

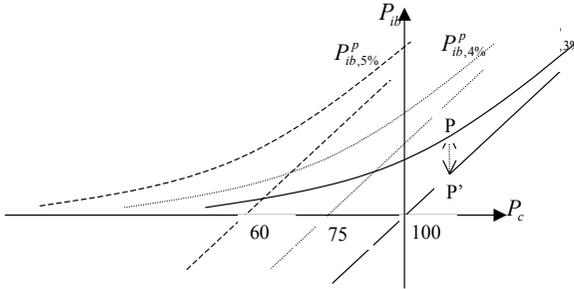
where VC and VP represent call value and put value respectively.

3.3 Price of Consols and price of India bonds with put option

The put option enabled investors to exchange their India bonds for cash at nominal value. The price could never then drop below that value (£100 here). Naturally, the lower the Consol price, the more the option is attractive and the wider is the spread between P_{ib}^p and P_c . But the more the Consol price rises above the nominal value, the less valuable is the option and the smaller is the spread between the two prices. This remains true for every India bond coupon rate.

The value of the option adds to the optionless India bond price, since it benefits investors. On the graph below, it reads as the vertical distance between the curve $P_{ib,3\%}^P$ and the line $P_c = P_{ib,3\%}$, e.g. the segment $[P, P']$.

Figure 1: Price of India bonds with put option only at different coupon rates



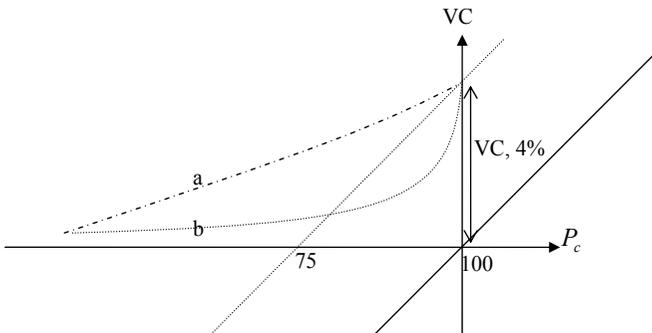
3.4 Consol price and price of 4% India bonds with call option

The call option gave the East India Company the right to buy back its bonds at nominal value, after giving six months' notice. Obviously, the option was of interest to the Company only when the Consol price rose. The higher the Consol price rose, the more likely would it be that the Company would exercise its option and the more the cost to investors would grow.

Figure 2 below illustrates the value of the 4 per cent India bond call option in relation to the Consol price. Supposing that the put value approaches zero when $P_c = 100$, we obtain:

$$P_{ib,4\%}^{c,p}(100) - VC_{4\%}(100) = P_{ib,3\%}^p(100)$$

Figure 2: Value of 4% India bond call option in relation to Consol price

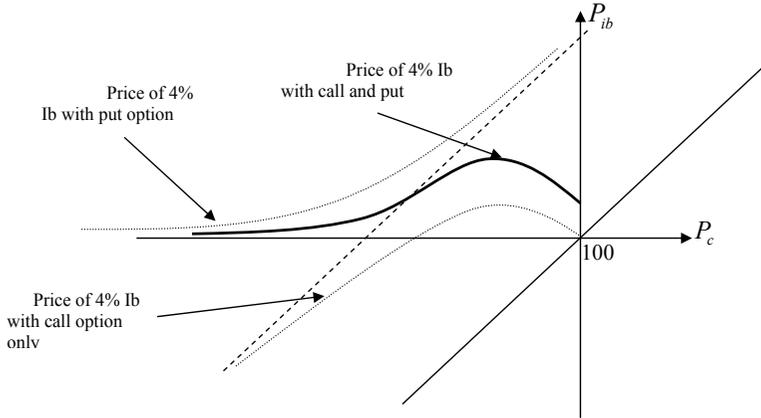


The shape of the curve will depend on agents' expectations. If they consider it very likely that the Consol price will increase and the option will be exercised, the call option's value will rise linearly with the Consol price (curve a). If, on the other hand, they believe that there is not much likelihood of the Consol price rising to the point where the call option is exercised, they will attach little worth to the call option up to P_c values approaching 100. In this case, the call value will rise, but much

more steeply, from higher P_c values (curve b). Figure 3 below shows the curve:

$$P_{ib,4\%}^{c,p}(P_{c,3\%}) = P_{ib,4\%} + VP_{4\%}(P_{c,3\%}) - VC_{4\%}(P_{c,3\%}).$$

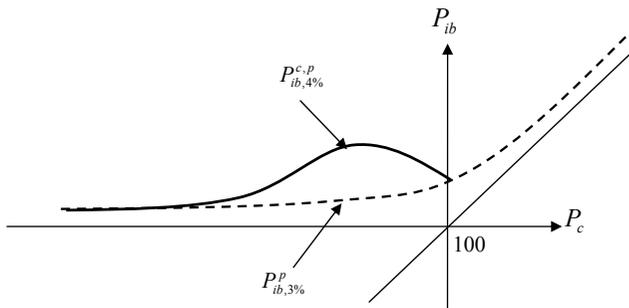
Figure 3: Price of 4% India bond in relation to Consol price



3.5 Price of India bonds with different coupon rates in relation to Consol price

Figure 4 below shows the price of 3 per cent India bonds with a put option only and the price of 4 per cent India bonds with both put and call options. Providing contemporary investors understood these kinds of options well and markets were efficient, observations for 4 per cent India bonds should have a non-linear camel-hump shape and no observations of these securities should exist for Consol prices higher than 100, since the East India Company would have converted them into 3 per cent India bonds beforehand. In the case of 3 per cent India bonds, which we have supposed to be devoid of a call option, observations should have two asymptotes: the diagonal $P_{c,3\%} = P_{ib,3\%}$ when $P_{c,3\%} > 100$, and the axis of abscissas when $P_{c,3\%} < 100$.

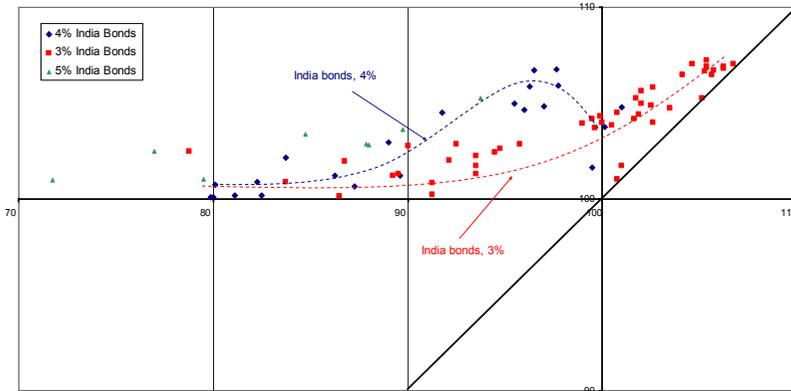
Figure 4: $P_{ib,3\%}^p$ and $P_{ib,4\%}^{c,p}$ in relation to $P_{c,3\%}$



4. Course of India bond and Consol prices, 1727-63

The best way of finding out whether contemporary investors knew how to evaluate the options embedded in India bonds would be to test a mathematical relation between Consol price and India bond price. We have seen that this unfortunately is not possible. The question can, however, be answered graphically, by seeing whether the India bond price matches the shapes displayed above. The fact that the expected shapes are non-linear and differ according to coupon rate makes the method all the more reliable.

Diagram 4: *Observed India bond prices in relation to Consol prices (□)*



Source: *The Course of the Exchange, Lloyd’s List*

Diagram 4 above displays the prices of 3 per cent and 4 per cent India bonds in relation to Consol prices from 1727 to 1763, and the discontinuous lines represent the theoretical shape predicted by our model. All the expected results are there: the 4 per cent India bonds have their non-linear camel-back shape and the 3 per cent India bonds have their two asymptotes; their price never drops below their nominal value and is always higher than the Consol price. Thus it would seem that the eighteenth century investors understood the options embedded in India bonds and were capable of evaluating them correctly.

5. What was the purpose of using these securities?

As we have just shown, back in the early eighteenth century a financial instrument, the India bond, was equipped with sophisticated features that foreshadowed what we now term call and put options. There are three possible reasons for the creation of these financial instruments: provide a low cost credit to a company without any reputation or credit history, providing a liquid and stable instrument to the market, or the unforeseen consequence of a Parliament regulation.³

The most plausible explanation is that the features described came into existence, little by little and more or less by chance, as the unforeseen consequence of a regulation.

We have seen that India bonds were nominally short-term securities. When they began (around 1702), they were probably repaid at maturity, then reissued. It is quite possible, however, that they were viewed as being very secure and liquid and that their holders were keen to buy them up again after redemption. It is probable that, gradually and with the investors’ blessing, they were kept in circulation beyond the maturity date, with the coupon continuing to be paid twice a year, just as though they were long-term securities. It is more than likely that the East India Company would

³ For a full discussion of the various possible reasons, see the original article.

have preferred to exchange them against long-term bonds – which it in effect hastened to do in 1751 as soon as Parliament gave it the go-ahead. Until then, Parliament had allowed the East India Company to deal in short-term, but not in long-term, debt. So it was that these securities remained nominally short-term while circulating as long-term. The Company, and the investors, could thus buy (sell) back the securities at their nominal value once the putative maturity date arrived. It was this possibility which is equivalent to put and call options.

Therefore, it could be said then that the birth of such a modern financial instrument at the beginning of the eighteenth century was nothing more than the paradoxically beneficial effect of Parliamentary economic regulation.

Conclusion

India bonds were among the most liquid securities available on the London market during the first half of the eighteenth century. We have shown that, although nominally short-term, they were in practice equivalent to long-term bonds with embedded put and call options. We have designed a method for graphically determining the India bond price in relation to the Consol price and shown that the course of India bond prices and observed coupon rate changes are consistent with it. This proves that contemporary investors knew how to value these securities despite the fact that their mathematical tools were not as sophisticated as today's – and Black and Scholes had not yet invented their formula for evaluating options. To conclude, we suggest that the appearance of such a complex and modern financial instrument in the early eighteenth century was the result of Parliamentary economic regulation.

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Fiscal centralization, limited government and public finances in Europe, 1650-1914

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In 1650, most European countries faced two fiscal problems. On one hand, nearly all rulers had absolute fiscal discretion, meaning that they were able to spend state funds as they wished. As a result, rulers often chose personal consumption (for example, foreign military adventures) over public services that would most benefit society (for example, roads). To solve this problem, the power of rulers had to be limited. On the other hand, European states also suffered from fiscal fragmentation, meaning that central governments were forced to bargain with numerous local bodies over tax amounts. Indeed, each locality attempted to free-ride on the contributions of others, leaving states starved for revenues. To solve this problem, tax systems had to be centralized, enabling single authorities to take control of collection.

Much of the contemporary literature on political institutions and economic outcomes centres on the problem of absolute fiscal discretion, suggesting that limited government itself matters to economic development.⁴ Yet as Acemoglu (2005) points out, wealthy economies are typically supported by powerful states, where central governments are able to raise large tax amounts and play a valuable role in the economy. For example, there is a strong positive relationship between central government tax revenues and per-capita GDP, suggesting that the state's ability to tax matters to economic welfare.

Indeed, fiscal fragmentation remains a serious issue in poor parts of the world. Herbst (2000), among others, has argued that divided fiscal authority and economic stagnation are directly linked for many African nations.⁵ Dictatorial regimes also plague several of the same countries. In such cases, there is a direct link with pre-nineteenth century European states, when rulers had great control over expenditures, but less command over revenues.

One useful way to improve our understanding of the effects of absolutism and fragmentation on public finances is to examine the evolution of state fiscal systems over the long term. In this regard, Europe is ideal to study. First, there was a clear pattern of political and economic changes from 1650 to 1914, as European states replaced Old Regime institutions with modern ones. Second, European forms of fiscal governance have been imitated throughout the world, making such an enquiry valuable.

With that said, much of the literature on the historical political economy of Europe suffers from another sort of one-sidedness, attempting by induction to generalize the results of specific case studies. Hoffman & Norberg (1994), Bonney (1999), and Bordo & Cortès-Conde (2001), among others, describe the fiscal evolution of European states in intimate detail, focusing on case histories and dividing up states by chapter. There is a cost to this painstaking approach, however. In particular, the emphasis on particular cases makes it difficult to convincingly generalize any findings, since no systematic effort has been made to do so.⁶

⁴ For theoretical statements, see North & Thomas (1973), North (1981), and McGuire & Olson (1996), among others. For empirical studies, see De Long & Shleifer (1993), Knack & Keefer (1995), and Acemoglu, Johnson, and Robinson (2001, 2002), for instance.

⁵ This theme is more prominent in the political science literature than the economics one. Also see Migdal (1988), Wade (1990), and Bates (2001), among others.

⁶ This is not to say that European fiscal history has never been studied as a purely comparative phenomenon. Though there is no formal analysis, Tilly (1990) and Bonney (1995) provide voluminous accounts. For an abridged version in this vein, see O'Brien (2001). More recently, Stasavage (2005) uses econometric techniques to evaluate the politics of sovereign borrowing in early modern Europe (1274-1785). Similarly, Dincecco (2006b) systematically tests the relationship between political transformations and sovereign credit risk for a panel of European states from 1750-1914.

For instance, based on their reading of English history, North & Weingast (1989) claim that oversight by parliament after the Glorious Revolution of 1688 enabled the crown to make a credible commitment to responsible fiscal policies.⁷ Following this political transformation, the state had access to more plentiful, cheaper loans, because investors had greater confidence in the ruler's ability to repay them. Since the time of the article, many other scholars have examined the link between limited government and public debt.⁸ This line of research, however, has overlooked a more basic point, which is the direct impact of limited government on state revenues and expenditures.

Moreover, England was centralized from early medieval times, making it anomalous among European states.⁹ Elsewhere, there was divided fiscal authority, meaning that central governments had to negotiate with local bodies over tax revenues. Indeed, the exceptional nature of English political and economic institutions calls the causal link between limited government and improvements in public finance into question.

In this light, Epstein (2000) uses the financial histories of pre-modern Italian states to argue that North & Weingast conflate the economic benefits of limited government with those of institutional centralization, claiming that political and economic fragmentation within states rather than fiscal abuse by rulers was the main cause of economic distortions in Europe prior to the nineteenth century.¹⁰ Certainly, in this context it makes less sense to discuss the fiscal power of rulers, which falsely presupposes the existence of strong, centralized institutions.

On the Continent, centralization of political and economic institutions often occurred during the French Revolutionary and Napoleonic eras (1789-1815). Afterwards, many European states more closely resembled pre-1688 England, possessing centralized but absolutist institutions. Hence, for the nineteenth century it is no longer anachronistic to consider how constitutional constraints on rulers influenced public finances.

Indeed, new costs arose when European rulers gained undivided fiscal authority. Even in absolutist regimes, organized bodies such as parliament exercised control over taxation, inducing rulers to seek extra-legal means to increase revenues, which they used to wage foreign wars and stifle internal opposition. Following fiscal centralization, rulers may have abused newfound powers to further undermine private property rights, making it easier for them to pursue larger revenues. In fact, this is just the sort of problem that North & Weingast envisioned when describing the virtues of limited government, which constrained the behaviour of rulers.

In this paper, I perform a systematic cross-country analysis of the effects of fiscal centralization and limited government on per-capita central government revenues and expenditures in Europe from 1650 to 1914, finding that both political transformations improved public finances. To measure these impacts, I first identify fiscal centralization and limited government within European states, each of which may be dated with relative precision. Next, I use regression techniques to carry out an analysis of the public finance effects of these political transformations on the assembled panel, which is comprised of data for five of the most important players in Europe at the time: Britain, France, the Netherlands, Prussia, and Spain.¹¹ For robustness, controls are implemented for a variety of other political and economic factors that also influenced public finance

⁷ It is disputable whether institutional changes resulting from the Glorious Revolution actually improved English property rights protections. Clark (1996), for instance, argues that secure property rights existed in England from at least 1600. Similarly, O'Brien (2001) argues that the constitutional and administrative structures underlying England's fiscal state were implemented from the 1640s.

⁸ Indeed, North & Weingast's work represents a valuable point of departure for many scholars. See, for instance, Frey & Kucher (2000), Sussman & Yafeh (2000, 2006), Quinn (2001), Stasavage (2003, 2005), Summerhill (2004), Bogart & Richardson (2006), and Dincecco (2006a, 2006b).

⁹ Brewer (1989), pp.3-7, Sacks (1994), pp.14-23, Epstein (2000), chapters 1, 2, and O'Brien (2001) pp.14-24.

¹⁰ Epstein writes that '... absolutism was largely a propaganda device devoid of much practical substance (13)'. Similarly, Hoffman & Norberg (1994) downplay the '... absolute in absolutism (393)'. Also see Henshall (1992), Rosenthal (1998), and Dincecco (2006a, 2006b).

¹¹ So far, the econometric tests incorporate Britain, France, the Netherlands, and Spain, since the Prussian data is still being assembled.

trends in Europe over this period. To round out the analysis, afterwards I break up the panel and discuss the French and Dutch cases in detail. In total, the results indicate that fiscal centralization and limited government each led to significant increases in per-capita revenues and expenditures, suggesting that both political transformations mattered to public finance improvements.

The work is organized as follows. Section 2 discusses the possible effects of fiscal centralization and limited government on public finances within European states from 1650 to 1914. Section 3 examines the relative levels of per-capita revenues and expenditures that we would expect to see associated with each of the three types of political regimes that existed in Europe at the time. Section 4 discusses the data used and the sample states selected. Section 5 performs the econometric tests and section 6 examines the two case studies. Section 7 concludes.

For the EHS conference version of this paper, submitted 5 December 2006, please refer to the conference website. For the most recent version, please refer to the author's website (http://www.imtlucca.it/whos_at_imt/researchers/index.php?id=14).

The emergence of a social investment network around an issuing bank: Barcelona 1844-56

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Introduction

One of the main characteristics of the first period of globalization was the extension of investment to almost all economic sectors of economy. New possibilities provided by the industry and the development and internationalization of capital markets, favoured the creation and diffusion of new banking institutions and financial instruments. Investment, one of the most important requirements to stimulate and ensure economical growth, was reinforced by this process.

Within the social, economical and political conditions of the nineteenth century, decisions about investment were based on trust and information obtained by economic agents through their social networks. Naomi Lamoreaux, in researching the influence of banking activities on economic growth, pointed out personal connections of banking directors to be a key element to explain the extension of loans and capital accumulation. These 'insider lending' procedures play a central role on the extension of investment and the development of entrepreneurial activities in New England during the first half of the nineteenth century¹.

But, what do we mean by a 'social network'? A social network is a social structure made of nodes which are generally individuals or organizations. It indicates the ways in which they are connected through various social familiarities ranging from casual acquaintance to close familial bonds. Alternatively, social networks could also be seen as flows of information and resources that circulate through different organizations, institutions and informal spaces, which are especially significant in highly uncertain situations and facilitate information costs reduction².

In the case of the Banco de Barcelona, we believe that the network which grew among the bank administrators after its foundation in 1844 was important for the bank itself in two senses. First, this social network diminishes information costs related to investment decision-making. Second, it facilitated screening, monitoring and enforcing operations of the bank customers.³ However, the positive effects of the network among these men crossed the limits of the bank. Trust relations forged and enforced between them, allowed the concentration of significant investments in certain firms of capital importance for the whole society.

The constitution of investment networks just when the Spanish economy was involved in a modernization process is really relevant. These networks nourished the development of certain firms and enterprises, besides contributing to shape the business network that was growing. Our general objective is to analyse the investment network that emerged from the Bank's activities in different historical periods.

Our main data sources are original documentation generated by Banco de Barcelona activities (Minutes of the board of governors and Minutes of the board of directors), and other sources (written press). Moreover, information about investment operations made by directors of the bank has been obtained from *Base de Dades del Departament d'Història i Institucions Econòmiques (Universitat de Barcelona)*. This database compiles information about all notary registrations related to the creation

¹ Lamoreaux, N. (1994): *Insider Lending. Banks, personal connections, and economic development in industrial New England*. Cambridge University Press.

² Casson, Mark (1997) *Information and Organization: A New Perspective on the Theory of the Firm*, Oxford: Clarendon Press.

³ Blasco, Y. (2006): *La modernización de las finanzas catalanas. El Banco de Barcelona 1844-56*. PhD Thesis. Barcelona.

of firms and changes on their ownership. Its accessibility has been essential to trace business relationships between investors.

The methodology used in this paper is already being successfully applied to the study of present business networks. More concretely, it consists of a combination of qualitative procedures commonly used in historical research (like systematic analysis of historical sources), with quantitative techniques to prospect, analyse and model social networks.

We pretend to corroborate, by means of these quantitative techniques, qualitative conclusions of previous research conducted in relation to commercial relationships established among Banco de Barcelona directorate's members. Two main questions have guided this exercise: Did the constitution of the Banco de Barcelona lead to the formation of a social network around the stock market of Barcelona at the mid-nineteenth century, and Did the Banco de Barcelona play a central cohesive role in a web of firms that help to dynamize investment and, therefore, the economy of the region? Results presented in this paper, and conclusions developed from them, refer only to the first question. Facing the second question properly is a longer-term task, that requires analysing the position of the Banco de Barcelona within a more general social and economical scenario (Barcelona at the second half of the nineteenth century).

In order to answer the first question, we have studied investment networks among directors at two periods in the bank's life: its foundation (in 1844), and a decade later in 1854. First results reveal that most members of the bank's Directorate, who were not 'connected' by investment before the creation of the bank, constituted a dense network a decade later. This strongly suggests that the bank could, effectively, act as an agglutinator element of investment.

The Banco de Barcelona and their investment network

To build up the investment network we have considered the founders of the bank for the 1845 period and all those who had been members of the Board of governors of the Bank for the period 1854-6. We have also considered the firms coincidence until the year of the network, but haven't taken care about if the firm was still alive. This is correct because our definition of connection is based on the trust link between the investors.

The importance of the members of the Board of governors of the bank in the period is obvious. Eleven of the sixteen industrial public limited companies created during the period 1844-56, were peopled by one or more persons of this group. If we also consider commercial firms, the percentage decreases to three in nine firms (three of six if we do not consider railway firms, a sector where the bank would play an important role in the following years).

Networks obtained from this sort of data are normally called bipartite or two-mode networks. These kinds of networks are composed of two types of elements: Individuals and projects or organizations they belong to (or where they meet). In our particular case, these types of elements correspond to the members of the Board of governors and the companies they decided to invest in. The most common procedure to manage this sort of network, is to separate them into two new networks (one for each kind of element). Consequently, we can obtain two networks from our data, one of investors and another of companies. Since our goal in this work is to study the social networks between investors, we have focused on the first network.

All networks are formed by vertices (or nodes) and links (or edges). In our particular case, nodes correspond to investors, and a link between two nodes means that the connected individuals have decided to invest in the same firm, at least, once. Such definitions of the edges correspond to the trust links existing between investors referred to above in the introduction of the paper. Note that these trust links reveal not only a certain level of confidence, but also uncover possible information flows between investors.

Once we have built up the networks of investors corresponding to the different historical moments described above, we have analysed them by means of methodologies borrowed from social network analysis. More concretely, we have represented both networks graphically and have calculated different kinds of nodes centrality.

Graphical representations have been made using Pajek, a computational utility which is able to draw complete graphs from a list of edges between vertices. In order to reach more intuitive representations of the networks, we have drawn the links in such a way that their width indicates the intensity of the relationship between nodes (the thicker the link between two investors, the more companies they have invested in jointly). Moreover, we have used an option of Pajek which represents the less connected vertices at the periphery of the network, leaving the most connected ones in the core.

About node centrality measurements, we have applied the three described by Freeman (1978),⁴ namely: degree, closeness and betweenness centralities. Although all three of them give information about the importance of vertices' position in the network, each one of them provides particular information that is worth mentioning here.

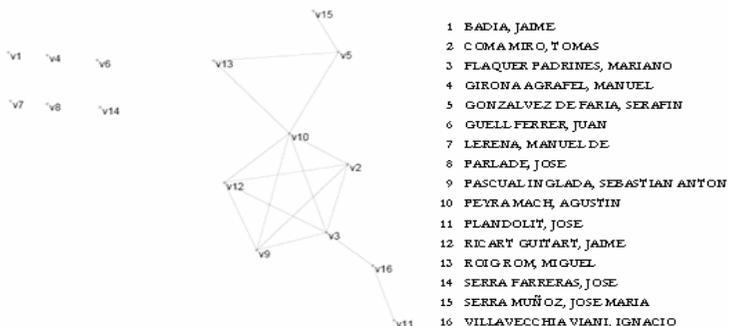
Degree centrality of a vertex is calculated by counting how many 'neighbours' it has, that is, the number of vertices it is connected to. Looking at our networks of investors, an individual with a high degree centrality (a 'popular' investment partner) could have a privileged global vision of the economical scenario, because of his connections to very different people.

To calculate betweenness centrality, we first have to obtain the shortest paths between all pairs of vertices of the network. By the shortest path we mean the shortest list of intermediaries needed to connect two nodes. For instance, if two nodes are directly connected, their shortest path has no intermediaries at all. Once all shortest paths are defined, betweenness centrality of a certain node is calculated as the ratio of critical paths he belongs to over the total critical paths existing in the network. In our case, investors with a high betweenness centrality occupied a strategic position in relation to information flows management, because their intermediate location gave them the opportunity to notice (and, probably, control) which information had arrived to whom, how and when.

Finally, the closeness centrality measures the 'physical' centrality of each node in the network. The node with the highest closeness centrality is the one with the shortest (in average) paths to all other nodes in the network. In a network where linkage is strongly related to trust, like our network of investors, closeness centrality can be associated to individual social capital (seen as those potentialities of each individual due to his relationships). An individual with a high closeness centrality is 'close' to other individuals, he can easily reach them (to obtain information, ask them for a favour or propose a business, for example) involving few intermediaries in the operation.

The first network (only with the founders) was scattered and not dense (graph 1). Six of the sixteen persons had no joint inversion, with the exception of the Bank. Of the remainder, two had only one connection.

Graph 1: *Investment Network of the Board of governors of the Banco de Barcelona, 1845*

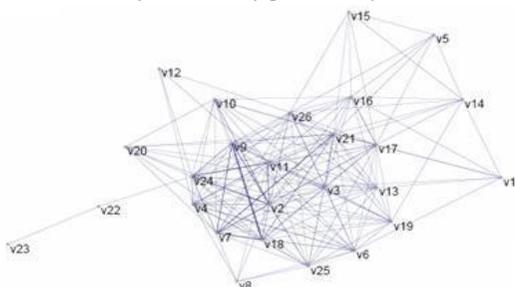


⁴ Freeman, L.C. (1978). *Centrality in social networks: conceptual clarification*. *Social Networks*, 1:215-239.

The most important actors in that network could be detected visually. The first one was *Agustín Peyra Mach*, who allowed the connection between the two investment subgroups. The first subgroup was formed by three people linked together between themselves (*Agustín Peyra*, *Serafín González de Faria y Miguel Roig*⁵). The second one was formed by five members also connected between themselves (*Agustín Peyra*, *Jaime Ricart*, *Sebastián Antón Pascual*, *Mariano Flaquer y Tomás Coma*). The other central person was *Mariano Flaquer* who was the link between the bigger subgroup and *Ignacio Villavecchia y José Plandolit*, who would become important later.

The second investment network (graph 2) was the result of the investments coincidence of the Board of governors of the Bank between 1845 and 1854-56.⁶ The result is a more dense and compact network. Since the most important people are not as easily identifiable as above, the quantitative results of centrality measurements are also shown.

Graph 2: Investment network of the Board of governors of the Banco de Barcelona, 1854-56



Code	Name	Grade centrality	Intermediate Centrality	Closeness centrality
1	AMELL CARBONELL, JOSÉ	0,28	0,0018	0,53
2	ASCACIBAR DE VILLOTA, CELEDONIO	0,72	0,0157	0,76
3	BADIA, JAIME	0,72	0,0163	0,76
4	COMA MIRO, TOMAS	0,68	0,0200	0,74
5	COMPTE, MANUEL	0,24	0,0000	0,52
6	FLAQUER PADRIN ES, MARIAN O	0,64	0,0167	0,71
7	GATELL, ESTEBAN	0,64	0,0040	0,71
8	GIRON A AGRAFEL, MAN UEL	0,24	0,0000	0,53
9	GONZALVEZ DE FARIA, SERAFIN	0,68	0,0065	0,74
10	GUELL FERREK, JUAN	0,52	0,0026	0,66
11	LERENA, MANUEL DE	0,80	0,0456	0,81
12	LLUCH GARRIGA, MARIANO	0,16	0,0000	0,52
13	MARTÍ C ODOLAR, JOAQUÍN	0,68	0,0114	0,74
14	MONTAGUT, JUAN	0,36	0,0071	0,57
15	MONTAGU, CARLOS	0,24	0,0000	0,52
16	PARLADE, JOSE	0,56	0,0274	0,68
17	PASCUAL IN GLADA, SEBASTIAN ANTON	0,80	0,0506	0,81
18	PEYRA MACH, AGUSTIN	0,64	0,0040	0,71
19	PLANDOLIT, JOSE	0,60	0,0070	0,69
20	RICART GUITART, JAIME	0,36	0,0000	0,60
21	ROIG ROM, MIGUEL	0,84	0,0639	0,83
22	SERRA FARRERAS, JOSE	0,08	0,0800	0,48
23	SERRA FARRERAS, LEODEGARIO	0,04	0,0000	0,33
24	SERRA MUÑOZ, JOSE MARIA	0,80	0,0798	0,83
25	TRESSERA, JUAN ANTONIO	0,60	0,0059	0,69
26	VILLAVECCHIA VIANI, IGNACIO	0,76	0,0561	0,78

In black we have the director board of the Banco de Barcelona in the analyzed period. So use: Own elaboration from the database of the Departamento de Historia e Instituciones Económicas de la Universidad de Barcelona

⁵ We notice that between these three persons was an investment connection before the foundation of the Banco de Barcelona. See notarial act of Planas y Compte, 1844 (f. 208 y ss). Arxiu Històric Col·legi de Notaris de Barcelona.

⁶ We have rebuilt the network from the accumulative data; we have considered as an investment coincidence all the people who had taken part in a firm as shareholder.

Only one of directors of the Bank had higher centrality values in the network: *José María Serra*.⁷ He was also Barcelona's main contributor at that time, although he played a secondary role in the 1845 network, when he was only connected to the other investors through *S. González de Faria*. He was a commerce man with strong links in Spain and Latin America, but a weaker acceptance among the bank shareholders. Despite this little acceptance, his centrality in the investment network was high, especially in *intermediation*. *Serafín González de Faria*, on the other hand, had changed to a more secondary role, with low centrality values, though he maintained a privileged position in the core of the network as we can see in *closeness* values.

The central roles in the investment network in 1854-6 were played by those belonging to the two subgroups of the 1845 network, despite the fact they were not centrals (*Miguel Roig y Sebastián Antón Pascual Anglada*), and other people that originally had no investments with the other Board of governors members (*Manuel de Lereña y José María Serra*). All of them members of the founders core of the Banco de Barcelona.⁸ This could be a sign to consider the foundation of the Bank as a result of the coincidence of multiple and different business groups, which could be led by those persons. At the same time, the Bank favoured the compacting of the investment network due to crossed investments between these groups, in an expansive firm creation context.

We should stress the importance of *José María Serra* because he became, and not *Manuel Girona*, the centre of this investment network. This is not obvious in the economic history literature of the period, because *Manuel Girona* was considered one of the most important businessmen as the director of the Bank until he died in 1905. Moreover, he occupied important economic and politic positions.⁹ *Serra* had become an irrelevant person in the historiography, even though we consider that he could play an important part at the beginning of the Bank.

Another important individual, with higher centrality values, especially in *intermediation*, was *Ignacio Villavecchia*. He is found in the core of the network in 1854-6 although he played a secondary role in the first one, with only a collateral link with the main important subgroup through *Mariano Flaquer*. He also became director of the Bank. We find the same path in the other central person in 1845, *Agustín Peyra* who became a secondary actor later, although he maintained a place in the core of the network, next to the main important persons.

Finally, we should also recognize the important position of *Jaime Badia* and *Tomás Coma* (founders of the Bank but with no previous relations with the other members of the Board of governors), and *Esteban Gatell* and *Celedonio Ascacibar*, who were near the core in the second network. All of them made important industrial investments.

Conclusions

The main results of the social network analysis applied to the investment network of the bank board between 1845 and 1856, allow us to shed some light on important facts that happened during that firm expansion period in Barcelona. Firstly, we detect a process of compaction and densification in the investment network of the members of the Board of governors of the Bank of Barcelona during those years. And secondly, it allows us to detect the importance in the business development of that period of some of them who, until now, have usually been left out by researchers. For example, in the case of *Jose Maria Serra*. While at the beginning, when the bank was founded, he had no links with the other members, later he became one of the Directors.

⁷ The directors during the period were: Manuel Girona, José María Serra, Mariano Flaquer, who was forced to resign at the end of the period (1855) due to none clearly affair, and Sebastián A. Pascual. Mariano Flaquer became the director after the death of José Rafael Plandolit in 1846. His role in the bank was strongly influenced by his close relations with the Spanish court.

⁸ J.M. Serra had no investments with other members of the board administration but he had investments in other firms.

⁹ In Francesc Cabana's book (2006): *Los cien empresarios catalanes*. Ed. Lid. Madrid. Only Manuel Girona was considered while Serra remains in anonymity.

There are some interesting issues that could be the subject of future investigations. On one side, the central role played by the group of *indianos*¹⁰ in the configuration of the investment network. Further research should consider the importance of this community in the formation of the bank and in the firm expansion of period. On the other hand, the possibility that some enterprise groups existing before 1845 (and, maybe, in competition among them), joined to create the Bank of Barcelona. Such an operation, conceived to take profit of the synergies derived from a share management, would result in the compaction of the investment network.

¹⁰ Returned migrants who had gone to American Spanish colonies and then came back with some capital.

Monetary policy during the Great Depression: a Bayesian FAVAR approach¹¹

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1. Introduction

Beginning with the seminal contribution of Friedman & Schwartz (1963), the Great Depression has traditionally been associated with restrictive monetary policy. In 1928, the Federal Reserve responded to the stock market boom with interest rate hikes from 3.5 per cent in January to 5 per cent in September. Between July and October of 1929, it raised its discount rate by another percentage point. After the October stock market crash, the discount rate was reduced again, down to 2 per cent in January 1931. However, given the rapid decline in price levels, ex-post real interest rates remained high. Monetary authorities also failed to intervene in the banking crisis that unfolded beginning in December of 1930, and interest rates increased again after Britain's departure from the Gold Standard in October 1931.

This paper is about submitting the role of monetary policy in the Great Depression hypothesis to empirical test. This task is a complex one, as several different channels of monetary policy transmission during the depression have been proposed. The original position of Friedman & Schwartz (1963) centred more strongly on the role of monetary policy in deepening the slump. This version of the monetary paradigm is consistent with the emphasis placed on bank panics by Bernanke (1983, 1985) and others. Bernanke's research stressed financial channels of monetary policy transmission, emphasizing the role of information asymmetries and participation constraints in debtor/creditor relations, as well as of debt deflation.

In the light of the various proposed transmission mechanisms, traditional VAR analysis soon reaches its limits, as it only allows for a small number of time series to model the pertinent dynamics of the money/income causation. One alternative that has been pursued in the recent literature was to obtain counterfactuals from well-specified DSGE models of the Great Depression that focus on one specific monetary transmission mechanism. Bordo, Erceg & Evans (2000) specify a DSGE model with sticky wages, finding evidence in favour of a nominal wage rigidity channel of monetary policy transmission. Christiano, Motto & Rostagno (2004) propose a DSGE model with a permanent increase in liquidity preference during the depression, and argue that given this preference shift, easy monetary policy à la Friedman & Schwartz would have mitigated most of the slump.

However, non-monetary interpretations using DSGE techniques seem to have worked equally well in modelling the interwar depression. Prominently, Cole & Ohanian (2005) specified a model of collective wage bargaining stressing the role of real wage rigidity. In a model of international business cycle transmission in the Great Depression, Cole, Ohanian & Leung (2005) examined monetary policy and productivity shocks alongside each other, and found only a minor role for monetary shocks in explaining the slump. Hence, existing research offers a whole menu of interpretations which all seem consistent with the data, although they partly exclude each other. This is what motivates the approach taken in the present paper. Compared to existing research on the Great Depression, we aim to impose less structure and at the same time analyse a richer dataset.

VAR evidence on the Great Depression is sparse. Ritschl & Woitek (2004) employ time-varying techniques on four different specifications of the monetary transmission mechanism and find that monetary policy explains less than 5 per cent of output forecast error variance. Given the limitations to data quality in the interwar period, working in a FAVAR framework thus seems particularly promising, as the underlying DFM approach aggregates information included in a large panel of disaggregate time series. The statistical aggregation procedure implicit in the FAVAR

¹¹ A detailed version of the paper, including graphs and figures referred to in the text, can be sent on request.

presents an alternative to historical monetary statistics and reconstructed national accounts with their unavoidable interpolations and inaccuracies.

Both traditional VAR analysis and FAVARs for US data have obtained significant but quantitatively small effects of monetary policy on output. In a long-term study on the US since the 1930s, Sims (1999) finds that monetary policy on average explains around 12 per cent of forecast error variance in output.

The aim of the present paper is to track the effects of US monetary policy during the interwar years in the data-rich environment provided by the FAVAR approach introduced into monetary policy by Bernanke, Boivin & Elias (2005) (henceforth BBE), and to evaluate them against the postwar evidence collected in previous studies. The Friedman/Schwartz (1963) hypothesis on the monetary causes of the Great Depression would suggest that the effects of interwar monetary policy were significant and certainly larger than the rather modest estimates obtained for postwar US data. Any findings that suggest only minor effects of monetary policy would then have to be interpreted as cautioning against a primarily monetary explanation of the Great Depression.

Section 2 and 3 present the econometric framework; section 4 provides the empirical results for the recursive and the alternative agnostic identification schemes according to BBE and Uhlig (2005) respectively. Section 5 concludes.

2. The Econometric Framework

A. FAVAR

The idea behind the FAVAR approach is to combine the standard structural VAR analysis with the recent advances in dynamic factor models, estimating a joint VAR for the policy instrument of interest Y_t which is perfectly observable and has pervasive effects throughout the economy and few factors F_t extracted from a large panel of informational time series X_t . The model is:

$$X_t = \Lambda^f F_t + \Lambda^y Y_t + e_t$$

$$e_t \sim N(0, R)$$

Here Λ^f and Λ^y denote the matrix of factor loadings of the factors and the policy instrument. The idiosyncratic component e_t has a diagonal covariance R .

The FAVAR state transition equation represents the joint dynamics of factors and the observable policy variables (F_t, Y_t) .

$$\begin{bmatrix} F_t \\ Y_t \end{bmatrix} = \Phi(L) \begin{bmatrix} F_{t-1} \\ Y_{t-1} \end{bmatrix} + v_t$$

$$v_t \sim N(0, Q)$$

The index $t=1, \dots, T$ represents time and the term $\Phi(L)$ represents a conformable lag polynomial of order d .

3. Empirical Results

Recursive Identification of VAR Innovations

In this subsection, we present impulse responses functions and variance decompositions for a selection of the 123 informational time series, employing the recursive identification of the

innovations in the VAR where as in BBE (2005), the policy instrument Y_t is ordered last.¹² In the following, are presented the results for a contractionary monetary policy shock for various possible choices of the monetary policy instrument.

1. Policy Instrument: M1

As can be seen from inspection of the graphs for **M1**, as the policy instrument figures 4 and 5, the effects of a monetary contraction are stronger for nominal than for real series, as should be expected.

The effects on the FRB index of manufacturing (FRB_MFC) and several contemporary indices of economic activity, as well as on leading indicators of equipment investment such as steel output and order flows for machinery, are mostly positive on impact, and veer into negative only after considerable lags. In other words, we face a quantity puzzle: rather than reacting negatively to an adverse monetary shock as they should, the output series show a mostly positive response. However, none of this is significant.

Clearly, the FAVAR model and the vast amount of disaggregate information it includes is itself not sufficient to prevent sign puzzles.

2. Policy Instrument: M2

Next we examine the responses to an adverse shock in **M2**, assuming for the moment that M2 is what the Federal Reserve indeed targeted. From a modern viewpoint, there would be doubts that M2 was actually controllable by monetary policy. On the other hand, Friedman & Schwartz (1963) discussed persistent shocks to the currency/deposit ratio during the depression, and argued that failure by the Federal Reserve to accommodate this shock may have contributed to a deepening of the depression. The same reasoning is reflected in recent work by Christiano, Motto & Rostagno (2004), who model a liquidity preference shock in a DSGE model. In their framework, failure to accommodate the desired increase in cash balances has strong real effects. We implement this idea by tracing the effects of shocks to a monetary aggregate that includes a sufficiently wide definition of time deposits.

As can be seen from figure 6, the responses to an adverse shock to M2 are almost impossible to distinguish from the effects of a similar shock to M1. Again, we find price and quantity puzzles alongside each other. These results suggest that it made no difference whether the Federal Reserve targeted a narrower or a wider monetary aggregate.

3. Policy Instrument: Discount Rate

Figures 8 and 9 present the results for an increase in the Federal Reserve's **Discount Rate**. This specification is consistent with the recent literature on inflation targeting, and hence is our own preferred benchmark. We now find that on impact, most responses have the predicted negative sign. However, at longer horizons, both the quantity puzzle and the price puzzle reappear. As to the explained variance, there is little change with respect to the previous specifications.

4. Policy Instrument: Commercial Paper Rates

The disappointing results from the previous exercise suggest an alternative choice of the target interest rate. In the following, we consider the **Commercial Paper Rate** on three-month IOU bills as the relevant policy instrument (always assuming, perhaps heroically, that the Federal Reserve was able to fully control this rate). Results for the effects on real variables in figures 10 and 11 show the same hump-shaped pattern of the impulse response functions. While the sign puzzle is still strongly present at short and medium lags, the negative responses after slightly less than two years come out better than before and are near-significant.

¹² A detailed discussion of identification through Cholesky decomposition in the FAVAR context appears in Stock & Watson [2005].

A glance at the variance decompositions in figure 11 reveals that there is a price for this slight improvement in the impulse response functions. The explained part of the forecast error variance in the indices of economic activity, as well as the FRB_MFC, is now always lower than under the assumption of the federal discount rate as the policy instrument.

Drawing the above discussions together, the traditional Cholesky identification of shocks to a FAVAR with US interwar data yields disappointing and worrisome results: price and quantity puzzles abound, and in no case do we obtain significant and robust real effects of monetary shocks. This is independent across the four candidate policy instruments we choose, and turned out to be highly robust to changes in specifications and the estimation period.

B. Identification of VAR Innovations by Sign Restrictions

The resilience of the price puzzle in the FAVAR exercises of the preceding section suggests that, contrary to the hopes expressed in BBE (2005), augmenting the VAR by factors distilled from a large panel of time series may not be sufficient to ensure well behaved impulse response functions. Consequently, the whole issue of correct identification in VARs emerges again, which motivates us to repeat the above exercises with Uhlig's (2005) sign restriction identification. The intuition behind this approach is to impose economic conventional wisdom and discard all realizations that are inconsistent with the prior sign restrictions. We implement this by imposing a sign restriction on the response of the CPI, Non-borrowed reserves and the short-term interest rates to a contractionary monetary shock.

1. Policy Instrument: M1

Figure 12 shows the responses to a contractionary M1 shock under a sign restriction approach. As can be seen, imposing the sign restriction exacts a high price: the impulse responses for most real variables are essentially flat and never significantly different from zero.

2. Policy Instrument: M2

Next, we examine also the response to a wider monetary aggregate. Again, this is motivated by the claim that the Federal Reserve mistakenly ignored large and persistent shifts in the currency/deposit ratio, which would only incompletely be reflected in the narrower M1 aggregate.

It turns out that there is little change with respect to the results obtained from a shock to M1. Hence, the conclusion would be that targeting one or the other monetary aggregate was of little importance as far as monetary policy shocks are concerned. In any case, our results indicate that shocks to either monetary aggregate were without real effects.

3. Policy Instrument: Discount Rate

The next step is to trace the effects of an increase in the discount rate of the Federal Reserve. The responses of most real variables are hump- or s-shaped, starting from a near-significant negative response. Around a one-year lag, the responses veer into positive and swing back to zero or slightly negative around a three-year lag. However, most of these movements are insignificant (figure 16).

The variance decompositions show most of the real effect on the indices of business activity after three years, with a peak around 20 per cent. In contrast, the explained part of the variance of the FRB_MFC remains solidly below 10 per cent, averaging between 6 and 7 per cent over the four-year horizon that we look at. This seems close to the values reported by BBE (2005) for postwar industrial output.

Drawing the results of this section together, we find that the responses of the real economy to contractionary monetary shocks are in general weak and, pathologically change their signs. This result obtains under four different specifications of the monetary policy instrument and two different identification schemes seems very robust to changes in data, specifications, and the estimation period.

Conclusion

We find that while monetary policy was clearly not neutral, its effects on the real economy were mixed and changed signs. Also, we find the overall contribution of monetary policy to the variance explanation of real variables to be as low as in the postwar period, if not lower. We also find that under the traditional temporal ordering of innovations to the VAR, the price puzzle is back, in spite of the large amount of information fed into the dynamic factors in the VAR.

Under a sign restriction approach, the results come out sharper but are still far from telling a clear-cut story about the pervasive effects of monetary policy during the Great Depression. At the present stage, we conclude that while monetary policy effects certainly played some role in the interwar depression, there is only scant support for the traditional hypothesis that the Great Depression was mostly a monetary phenomenon.

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Collusion, regulation and rivalry in Spanish banking during the Franco regime

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The most common hypothesis in banking market structure that prevails in the historiography of nearly all European countries is the cartel hypothesis. That is, banks colluded, generally with governmental support, so competition was lacking in the banking systems. The aim of this paper is to offer some evidence about collusion and rivalry in the Spanish banking industry in the years of rigid regulation, between the Civil War (1936-39) and the beginning of the financial reform in 1974.¹³ After a brief review of the Spanish banking regulation (section 1), the paper presents some evidence of the enforcement of banking regulation (section 2), and about the implementation of collusive agreements among banks (section 3). Then, it presents some indirect evidence about concentration and branching expansion (section 4). The paper closes with conclusions.

I

The first Spanish banking law was enacted in 1921 and made up a system of auto-regulation. Some important regulatory issues were delegated to a committee of bankers and, additionally, this committee was set up as a forum where government officials and bank representatives could meet to advise government on an appropriate regulation. However, political turmoil prevented the CSB from reaching its targets and the enforcing of banking regulations in Spain before the Civil War left a lot to be desired.

In 1938, Franco's government reassumed full responsibilities for banking regulation and disbanded the bankers' committee. However, some months later an entrepreneurial association was converted in an official advisory body. Therefore, in a few months, the new authorities broke the previous regulatory system and set up the basis of a new scheme. The Ministry of Treasury took charge of regulation and a bankers' association was entrusted with advisory functions and the duty to communicate governmental guidelines to private banks.

Nevertheless, the most remarkable characteristic of the Spanish banking system after the Civil War was the so-called *statu quo* that was established as a by-product of the monetary arrangements to reunify the two monetary areas that the Civil War had created. Thus, in October 1939, the Ministry declared the *statu quo* in the banking industry: it was forbidden both to establish new banks or open new branches as long as the monetary reunification was not over. However, at the end of 1940, this state of affairs was extended 'until other thing were stipulated' without further comments, so the *statu quo* was prolonged *sine die*.

II

Scholars took for granted that the regulations were fully implemented. Then, it was stated that banks could not compete against each other in any way. However, recent research has cast doubts on the way banking regulation was enforced. Here, four aspects are treated to outline the actual implementation of regulation: creation of new banks and branches, and the fixing of legal ratios and interest rates.

Since the end of 1939, once the *statu quo* was declared, no new bank could enter the banking industry without governmental authorization. To enforce the closure of the market, all banks and bankers were required to apply for registration on an official list and, once the register was closed in 1954, no new bank was authorized until 1963. Therefore, only one way to enter the market was left: buying one of the incumbent banks, which in some cases were only a brand name without real

¹³ For recent literature on the subject, see Martín Aceña & Pons (1994), Pons (1999, 2001, 2002), Faus (2001), García Ruiz (2002), Pueyo (2003, 2006a, 2006b, 2006c), and Tortella & García Ruiz (2004). For UK, see Capie & Billings (2004).

activity. Although official approval was also needed to complete any acquisition, it seems that the Ministry rarely objected to private agreements provided that the target bank solvency was guaranteed. Hence, groups of entrepreneurs without previous experience in banking entered the market (Banco Atlántico, Banco de Madrid, Banca Catalana).

The other aspect of *statu quo* was the branching regulation. To begin with, the government banned the opening of branches in 1939. From 1945 to 1963, branching was subject to governmental authorization. According to summaries of requesting files (see table 1), the first applicant was not always the one who achieved authorization. The administrative procedure included a two-month period within which other banks could apply for the new premise. In our sample, 32 per cent of the requests were resolved against the bank that started the procedure. Data shows also that although three of the largest banks attained a high degree of success, other large banks obtained fewer offices than they had requested and the smaller entities as a group apparently achieved a balance result.

Table 1: *Branch requests, 1945-58*

<i>Bank</i>	<i>Requested</i>	<i>Achieved</i>	<i>Success ratio</i>
Banesto	6	13	2.2
Bilbao	14	24	1.7
Hispano Am.	38	60	1.6
Central	15	9	0.6
Popular	26	16	0.6
Santander	26	18	0.7
Vizcaya	12	8	0.7
7 largest	137	148	1.1
Others	85	90	1.1
Total	222	238	1.1

Source: *Circulares del CSB*.

Note: Sample of 210 files out of 244 processed between 1945 and 1958. Some requests were resolved authorizing more offices than had been asked for.

Banking reform in 1962 altered the administrative procedure and, possibly, changed political targets. There are no official statements about governmental goals, but a reform in the procedure in 1971 allows us to check whether there was any bias for or against large banks in the official branch expansion plans. In the plans of 1972-73, there were two groups of authorizations. The first (*normal shift*) is supposed to have followed the same criteria as the 1960s plans, but the second (*free shift*) was employed as a device to liberalize in fact branch opening, because in that part private banks could add whatever premise they wanted. A comparison of these two shifts shows that in the 1960s regulators favoured medium-size and small banks, so large banks had to include a higher percentage of applications in the free shift to attain the number of new branches they wanted.

Table 2: *Number of branches approved in expansion plans, 1964-73*

	<i>1964-70 (plans 1st to 7th)</i>	<i>1972-73 (plans 8th and 9th)</i>	
		<i>Normal shift</i>	<i>Free shift</i>
Seven largest	682 (42 %)	84 (35 %)	352 (49 %)
Other banks	936 (58 %)	159 (65 %)	368 (51 %)
Total	1.618	243	720

Source: CSB, *Anuario Estadístico de la Banca Privada*.

Despite governmental policy to control branch expansion, banks partially circumvented regulation through the figure of 'exclusive correspondents'. That is, banks used to agree with some agent (sometimes a bank employee) to act legally as a banking correspondent, but in fact business was conducted as a bank's branch. Then, government came to also regulate correspondent activities. However, these types of pseudo-branches remained in business until the beginning of the liberalization process in the mid-1970s.

Regulation also limited dividend distribution and obliged banks to provide funds for a reserve. Apart from this concern with banking solvency, governments made unofficial suggestions to banks to hold portfolios of public securities. In 1962, a coefficient of public funds was introduced, according to which banks had to invest part of their deposits in public debt holdings, and the government showed its willingness to increase its value according to its budgetary needs.

Interest rates also came under the direct responsibility of the government in 1938. However, the government refused to adjust rates and fees to the changing economic conditions. Thus, deposit interest rates remained unchanged from 1938 to 1964, and, after a slight readjustment, five years elapsed before they were modified again. However, banks usually circumvented official deposit rates by paying 'extra-rates' (payments to depositors above legal rates), apparently without any governmental reaction.

III

Regulation might have helped collusion, but this type of agreement has its definite evidence in the explicit pacts among banks. Recently, the existence of collusive pacts among banks after the Civil War has been documented from the archives of private banks. Four agreements were approved, in 1941, 1949, 1952, and 1960. Each one had clauses about maximum deposit rates, minimum loan rates, fees, enforcement bodies and fines. In addition, each agreement gave earnest advice to curb competition among banks, a signal that pacts were not observed for a long time. Banks also tried to involve the government, but they failed in 1941 and 1949. According to official notes, there was no disapproval with the content of the agreements, but the government was reluctant to leave such matters in the hands of the private sector. Finally, government support was achieved indirectly in 1952 and officially in 1960, but apparently without improving the enforcement of the pacts.

Conclusions from the aforementioned work coincide with the textbook explanation of the functioning of any typical oligopolistic market. Firms have incentives to collude but, subsequently, to cheat on the agreement. This way, the industry goes through succeeding stages of collusion and rivalry. In the case of the Spanish banking industry after the Civil War, private firms were incapable of sustaining collusive agreements, even when they had governmental support. This type of industry performance is coherent with conclusions reached in the previous section. Spanish governments were not hostile toward collusion among private firms, but they were concerned first and foremost with its own policies and goals. Therefore, they would have left the private banks to arrange their business on their own, providing they did not interfere with governmental objectives.

IV

Although the number of banking firms cannot be considered low, a few institutions controlled a high percentage of the market (see table 3). A high level of market concentration is considered as empirical evidence in favour of collusion, particularly when markets are not contestable. However, when its evolution over the whole period is considered, a different conclusion arises. As table 3 shows, market concentration in Spanish banking peaked in the 1940s and early 1950s, but from the mid-1950s onwards it decreased continuously until it reached its lower level in the mid-1970s. Therefore, if concentration measures the intensity of incentives to collude, then conditions in favour of collusion weakened gradually from the mid-1950s.

Table 3: *Economic concentration in Spanish banking, 1945-75*

	<i>HH</i>	<i>CR1</i>	<i>CR5</i>	<i>CR10</i>	<i>CR15</i>	<i>CR20</i>
1.945	0.1142	22.12	66.14	78.48	85.47	89.64
1.950	0.1112	20.28	67.67	79.18	86.13	90.06
1.955	0.1029	19.23	64.99	79.30	86.22	90.77
1.960	0.0982	18.13	63.61	80.02	85.86	90.27
1.965	0.0813	16.16	58.25	75.02	81.12	85.68
1.970	0.0767	14.32	56.64	74.39	80.83	85.53
1.975	0.0636	12.75	50.82	67.88	75.40	80.71

Sources: *Boletín del CSB. Balances Trimestrales de la Banca inscrita. Balances de la Banca Adherida al Comité Central de la Banca Española. Anuario Estadístico de la Banca Privada.*

Note: Hirschman-Herfindahl index (HH) and concentration ratios computed with current accounts and time deposits.

Likewise, provincial concentration indexes show the same development. They decreased continuously in 36 provinces out of 47 in 1950-60, and in 45 out of 47 in 1960-75.¹⁴ Hence, national indexes reasonably reflect the process that was occurring at lower levels. That is, a set of large and medium-size banks grew by the extension of networks of branches over the whole country, entering local markets, so concentration decreased both in national and local markets. Table 4 shows the number of provinces in accordance with the number of banking offices opened to the public. Whereas in 1950 the majority of provinces had less than 50 branches, in 1975 half of them had more than 100 offices and none of them had less than 20 offices.

Table 4: *Number of provinces classified by number of branches, 1950-75*

<i>Branches</i>	<i>1950</i>	<i>1960</i>	<i>1970</i>	<i>1975</i>
100 or more	3	3	13	25
50-99	8	12	20	16
20-49	26	28	15	9
1-19	13	7	2	0

Source: *Anuario Estadístico de la Banca en España.*

The number of branches also increased in all provinces, with the whole banking community taking part in the branching race. Table 5 shows the number of banking firms by number of offices. While more than half of the entities were unit-banks in 1950, 20 years later only a negligible number of firms remained in this category.

Table 5: *Number of banks classified by number of branches, 1950-75*

<i>Branches</i>	<i>1950</i>	<i>1960</i>	<i>1970</i>	<i>1975</i>
100 or more	5	7	8	12
50-99	4	2	6	16
20-49	8	10	12	22
2-19	42	45	77	53
1	89	45	7	5

Source: *Anuario Estadístico de la Banca en España.*

The evidence suggest that banks tried to extend their networks of branches in order to enter in contact with potential customers. The basis of this strategy was the possibility of using the branches as a competitive tool, because it was inside the bank offices where bank clerks could tailor financial products to privileged clients. Although there is no historical research about the type of products that banks offered to their customers, some indirect evidence can be found in a survey made in 1959 among entrepreneurs and high executives of non-financial firms about their relations with banks.¹⁵

¹⁴ Pueyo, 'Oligopolio y competencia', pp.190-1.

¹⁵ A. de Miguel and J.J. Linz, 'Los empresarios españoles y la banca', *Moneda y Crédito*, 84 (1963).

Businessmen were questioned about differences among banks. Therefore, 27 per cent of them answered that there were ‘large’ differences and 56.3 per cent that there were ‘some or a few’ differences. Only 16.7 per cent of the interviewees replied that there were no differences among banks. When they were questioned about what type of distinctions they perceived among banks, they reported divergences in product (loans) characteristics other than price (see table 6).

Table 6: Type of differences among banks perceived by Spanish entrepreneurs, 1959 (% of answers)

Amount of credit and overdraft possibilities	43
Collateral requirements	32
Duration of loans	31
Time needed for loan negotiation	23
Interest rates and other charges	18
Minimum deposit required	17

Source: De Miguel and Linz, ‘Los empresarios españoles y la banca’, *Moneda y Crédito*, 84 (1963), p.51-2.

The interviewees also said that they preferred to work with regional or local banks rather than with larger institutions because it was easier to establish bonds of friendship with branch officials. Interestingly, businessmen also thought that it was not only necessary to have confidence in their technical abilities to trust bank employees’ advice, but to rely also on their friendship. Consequently, in the central years of our period of study, businessmen thought that there were sufficient differences among each bank’s products to distinguish among them. In addition, they were of the opinion that a close relationship with managers of banks was needed to achieve a suitable service, pointing to the fact that branches, and explicitly their personnel, were essential for banking performance.

The final result of the contest for branches was an unequal evolution of banking firms in terms of market shares. In fact, concentration decreased mainly because the largest banks lost market share in favour of the medium-sized and small banks. In table 7, it can be seen that the two leaders (Banco Hispano Americano and Banco Español de Crédito) lost market share from the mid-1950s onwards, whereas the three followers (Banco de Bilbao, Banco Central and Banco de Vizcaya) kept a constant percentage of the market. Therefore, banks of smaller size filled the gap left by the two leaders.

Table 7: Market shares on deposits and branches, 1949-74

	Deposits				Branches			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
1949	39.73	24.33	4.85	31.09	30.59	27.63	6.10	35.69
1954	39.36	27.33	5.96	27.35	31.58	31.91	7.44	29.07
1959	36.00	27.79	8.55	27.66	32.35	30.57	9.75	27.34
1964	31.95	28.45	9.79	29.81	29.63	26.97	9.09	34.31
1969	28.86	26.25	10.82	34.07	27.96	26.05	9.75	36.24
1974	23.47	27.44	10.62	38.47	25.40	28.62	9.78	36.20

Sources: Boletín del CSB, Balances Trimestrales de la Banca inscrita, Balances de la Banca Adherida al Comité Central de la Banca Española, Anuario Estadístico de la Banca Privada.

- (1) The two largest banks: Hispano Americano and Banesto. (2) The 3 other large banks: Central, Bilbao and Vizcaya. (3) The new large banks: Santander and Popular. (4) All the other banks in the industry.

V

It is supposed that the type of regulation prevailing in the central decades of the twentieth century prevented rivalry among banks. As we have seen, although regulation in Spain was considered as a device to assist collusion, some public policies are difficult to reconcile with this interpretation. Thus, the new government formed after the Civil War broke the self-regulatory scheme prevailing before the Civil War and replaced it with an all-embracing interventionist system. In addition, the enforcement of this regulation reveals that the government had its own goals, relating to systemic stability and financing public expenses with banking funds. Within this context, private banks tried to collude and made an effort to draw government support. However, archival research proves that

the government was not very interested in private agreements, although there was no disapproval with their contents. Apparently government's objectives were independent of private bankers' aspirations to collude and the politics would have left the bankers to manage their own affairs provided that they did not interfere with public goals.

Undoubtedly, regulation shaped a framework favourable to collusion, especially because it put up very high barriers to entry. Only those banks that had been in business before the war were authorized to stay in the market. Then, banks took advantage of the situation to arrange anti-competitive accords. However, they recurrently failed to enforce them, so other factors apart from friendly regulation and entry barriers, had to be put in motion that hindered effective collusion.

Some recent papers have begun to offer some hints about the elements that impeded the enforcement of collusive agreements. Although the market appeared highly concentrated, a large fringe of medium-size and small banks that facilitated cheating accompanied the large banks. In addition, banks were apparently very asymmetrical in their strategies of branch expansion, despite the fact that governmental policy interfered in entrepreneurial initiatives. As public criteria are unknown, we are not sure whether the government fitted themselves to objective criteria or influence peddling played a part in the dealings, in which case it would be another factor to consider in the competitive game among banking firms.

Finally, banking is characterized as an industry with product differentiation. Accordingly, Spanish businessmen viewed differences among banks and considered other factors apart from the price in dealing with one institution or another. Product differentiation would hinder effective collusion because agreements had to stipulate more items than prices. As we have seen, the documented pacts only included rules about interest rates, leaving apart these other competitive factors. In addition, public regulation forbade rivalry, reducing the amount of information flowing across the market. Both elements probably impeded the enforcement of private agreements and facilitated cheating.

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Market transparency, uniform measurements and standardized quantities: institutional change in nineteenth century Britain

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Medieval markets were often structured around a 'moral' economy of measurements involving variable quantities.¹ Consequently, numerous institutions emerged to make transactions transparent. Examples include the public metage system – where state officials publicly measured quantities in every transaction – or the Assize of cloth and bread.² Such institutions existed until the nineteenth century when they were either changed or abolished. This coincided with the adoption of uniform 'national' measurement systems, such as the French Metric (1799) or the British Imperial (1824) systems. Where, the French state used coercionary measures to impose uniform measurements on markets, altering the old economic order,³ the British state in contrast is thought to have been far less coercionary.⁴ Nevertheless, similar market changes are suspected to have occurred in England also.⁵

Standardized quantities replaced older institutions of ensuring transparency, which further involved switching from customary to the new 'national' measures. Two distinct effects can thus be identified: an institutional change that replaced one market mechanism with another and a switch from an older technical standard to a newer standard. How can we explain such institutional changes? Why did the market switch standards? What were the underlying mechanisms? Sidney Pollard suggested that 'capitalist rationality' was responsible for achieving uniformity of measurement, with merchants responding rationally to increasing market complexity.⁶ William Ashworth attributes such changes to the increasing centralization of state administration and deregulation of industry.⁷ However, standardized quantities and uniform measurements imply changing values of accuracy and objectivity – recognizing fully that accuracy and uniformity are often used as instruments of rhetoric.⁸ Understanding the transition to standardized quantities requires reconciling these distinct views.

I investigate such issues through the case of the London coal trade. I argue that a system of public measurement was replaced by standardized quantities as a mechanism for ensuring transparency. This was a negotiated outcome involving distinct groups with political power, each with their own reasons for abolishing the public measurement system. Standardizing quantity also involved abolishing heaped measurements (another medieval practice) and switching measurement standards. I further argue that measurements were embedded in an 'institutional package' of measurement artefacts, regulations and customary practices and that standardizing quantity involved making changes to the entire package rather than just the measurement artefacts.

¹ Witold Kula, *Measures and men*, trans. R Szeleter, (Princeton, New Jersey, 1986).

² Robert Dickson Connor, *The weights and measures of England* (London, 1987); James Davis, 'Baking for the common good', *Economic History Review*, 57 (2004), etc.

³ Ken Alder, 'A revolution to measure', in M Norton Wise ed., *The values of precision* (Princeton, 1995).

⁴ Act on uniformity of weights and measures, 1824, 5 George IV C. 74. Especially clause XVI.

⁵ Julian Hoppit, 'Income, Welfare and the Industrial Revolution in Britain', *The Historical Journal*, 31 (1988), pp.721-31, at p.730.

⁶ Sidney Pollard, 'Capitalism and rationality', *Explorations in Economic History*, 20 (1983), pp.110-29.

⁷ William J Ashworth, *Customs and excise* (Oxford, 2003).

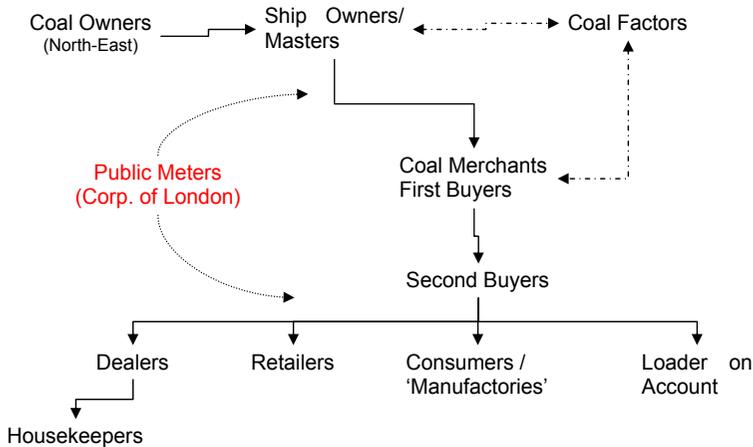
⁸ Theodore M Porter, 'Objectivity as standardization', in Allan Megill ed., *Rethinking objectivity* (London, 1994), Simon Schaffer, 'Metrology, metrication and Victorian values', in Bernard Lightman ed., *Victorian Science in Context* (Chicago & London, 1997).

Building upon existing work,⁹ I recreated historical events using primary sources including the archives of the Corporation of London Records Office (CLRO), evidence before parliamentary committees, etc. This paper first describes the structure of the London coal trade, identifies the key groups involved and evaluates the key issues regarding transparency, institutions and measurements. The following section highlights the important changes to the market institutions occurring between 1800 and 1832. The next section analyses the key institutional changes and explains why they occurred. The concluding section draws together the main arguments of the paper and their implications for understanding the transition of markets occurring in the late Georgian era.

I

London’s precocious appetite for coal was supplied since the fourteenth century from the north-eastern coal fields¹⁰ and even in the 1820s virtually all of London’s coal came via the coastal routes from Newcastle and Sunderland.¹¹ In terms of the structure (figure 1), the *Coal Owners* produced high quality coal which was delivered by *shipmasters* to commission agents in London, called *coal factors*, who acted as the link between the shipper and the buyers, customs offices, and the labour pool.¹² The factors (about 19 in number) arranged sales with merchants known as *first buyers*, who numbered about 70-75 around 1800.¹³ The trade was concentrated in the hands of a few individuals who functioned as a conduit for virtually all the coal entering London. The first buyers sold the coal to smaller merchants, retailers, consumers and large ‘manufactories’, together called the *second buyers*.

Figure 1: Supply Chain in the London Coal Trade (c1830)



The *public meters*, employed by the City, comprised the *sea meters*, employed to measure coal delivered from the colliers, and the *land meters*, to measure coal sold on the wharves. The meters

⁹ Raymond Smith, *Sea-coal for London* (London, 1961).; R A Mott, 'The London and Newcastle chaldrons for measuring coal', in J Philipson ed., *Archaeologia Aeliana* (Newcastle-upon-Tyne, 1962).; John Hatcher, *The history of the British coal industry (Volume 1: Before-1700)* (Oxford, 1993).

¹⁰ Hylton B Dale, *The fellowship of woodmongers* (London, c1922), p.1.

¹¹ Number of chaldrons imported into London, 1826-27, London, PP Vol. XVIII, p.495.

¹² Michael W Flinn, *The history of the British coal industry (Volume 2: 1700-1830)* (Oxford, 1984), pp.277-8.

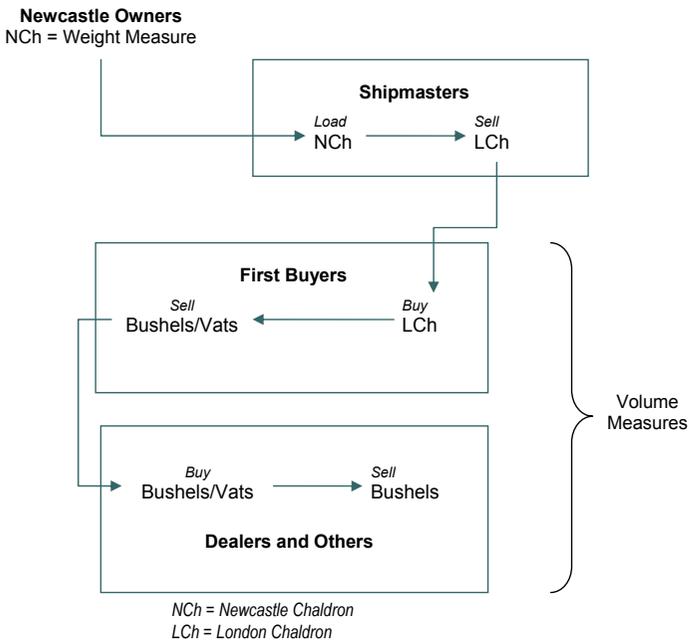
¹³ Report from the committee on coal trade, 1800, London, House of Commons Reports (1785-1801) Vol. X, p.553.

acted as ‘delegated monitors’, the quantity they measured became the basis for collecting other duties on coal, and the metage duty charged for this ‘service’ was a source of revenue for the City.

Numerous measurement units were used by the London trade (figure 2). Coal was loaded in the north using the Newcastle chaldron (NCh) – a *weight* measure, whereas it was unloaded in London using a *volumetric* measure – the London chaldron (LCh). The LCh was defined as 36 coal bushels,¹⁴ but there was no consensus on exactly how much *quantity* was contained in this measure. Modern and contemporary estimates have ranged from 288 to 396 gallons, or from 25.7 *cwt* to 28.5 *cwt* when measured by weight.¹⁵

One reason for this variation was that coals were to be ‘heaped up [in] the form of a cone’.¹⁶ In fact, 36 *heaped* bushels in actuality should have equated to about 48 bushels.¹⁷ The merchants allegedly often withheld the quantity that should have formed part of the heap, providing customers with ‘short-measure’.¹⁸ Difficulty in forming identical cones led to variability in quantity, in turn requiring close monitoring.¹⁹

Figure 2: Measurement Units used in the London Coal Trade (c1830)



¹⁴ Act for regulating the delivery of coals, 1807, 47 George III, C.68.

¹⁵ Mott, 'London chaldron', p. 230.; Hatcher, *Coal industry*, pp.568-9.

¹⁶ 47 George III, C.68. The heap was to hold about 30% more than the quantity in the vessel; see Report of the select committee on coal trade, 1830, London, PP Vol. VIII.

¹⁷ 48 bushels (not heaped) x 8.5 gallons of the coal bushel = 396 gallons; Smith, *Sea-coal*, pp.367-8.

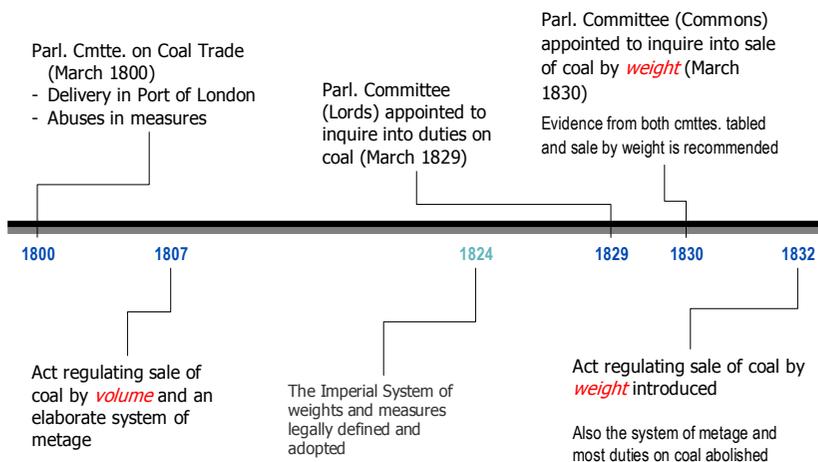
¹⁸ Report on Coal Trade (1800), pp. 559, 69, 600-1, etc.

¹⁹ PP 1830 Vol. VIII, p.77 & 87.

Another reason was the variable ratio used to convert from weight to volume. Contemporary estimates put the conversion ratio variously at 8:15, 8:17, 11:21, 1:2, etc.²⁰ Further, variable density of coal also caused conversion problems. For example, coal known as the Northumberland Wallsend weighed about 78.97 pounds per cubic foot, whereas stone-coal from Milford weighed about 89.38 pounds per cubic foot. No two bushels of coal could be made to weigh the same. Density also varied according to the size and condition of the cargo. It was known that smaller coals occupied ten per cent more volume than large coals of the same weight.²¹

Thus, the variation in quantity estimates could have been the result either of converting the quantities from NCh to LCh or due to heaped measurements. Comparing quantities reported in NCh with quantities measured in LCh across 22 voyages shows that on an average the ratio used to convert from NCh to LCh was 1:2.03, with a small variation of about two per cent. Further analysis of 74 voyages shows that the extent of variation due to possible differences in the density of coal was less than four per cent. In contrast, variation as a result of heaped measurements could be substantial. A merchant, by providing a 'stricken' instead of a heaped measure, could give approximately one-fourth less quantity to the buyer than was expected by law and custom.²² Reports of measurement frauds show that the extent of short-measure ranged between 5 and 33 per cent in individual cases.²³ Between 1800 and 1830, these issues formed the subject of several parliamentary reviews, along with other issues plaguing the trade (figure 3).

Figure 3: *Timeline: Review and Reform of the London Coal Trade (1800-1832)*



²⁰ Edington, *Coal Trade*, p.51.; Taylor, *Archeology of coal*, p.24.

²¹ T.Y. Hall, 'Remarks on the coal trade', *Transactions of the North of England Institute of Mining and Mechanical Engineers*, II (1853-54), pp.104-236, at p.209.

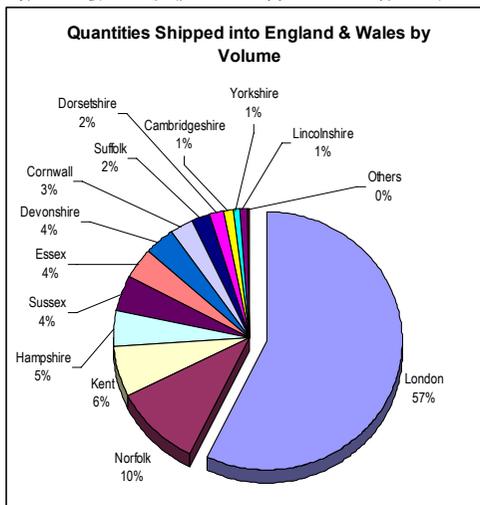
²² These data and analysis are discussed in greater detail elsewhere, (<http://www.lse.ac.uk/collections/economicHistory/pdf/FACTSPDF/1106Velkar.pdf>).

²³ Report on Coal Trade (1800). See Appendix Nos. 34 & 37.

II

A parliamentary committee of 1800 concluded that improper heaping was the primary reason for the measurement problems and that fraud was committed either due to the inattention or with the connivance of the meters.²⁴ The meter’s office was considered ineffective and the committee suggested that the land meters be abolished.²⁵ In response, the parliament introduced legislation in 1807 which was intended to iron out the problems facing the trade through increased regulation. The measurement infrastructure – the artefacts and monitoring technology (metage system) – was left virtually unchanged. The choice of measurement either by volume or weight was left to the market. However, the bulk of the coal continued to be delivered using the volume measure, whilst a tiny proportion – mostly transported by canal and some coal brought coastwise from Scotland – was sold by weight (figure 4).

Figure 4: *Quantity of Coal Shipped into England (1829)*



Quantity of Coal shipped Coastwise during 1829	Volume vs. Weight	
	Duty charged by Weight <i>Tons</i>	Duty charged by Volume <i>Chaldrons</i>
<i>Total for England and Wales</i>	210,495	2,706,828 (3,451,205)*
<i>Quantity shipped into London</i>	265	1,548,170 (1,973,916)*
* Equivalent figure in tons assuming 1 chaldron = 25.5 cwt and 20 cwt = 1 ton		

Source: Customs Returns, PP 1830 Vol. XXVII p.131

²⁴ Ibid., p.538.

²⁵ Ibid., pp.642-3.

Things lay simmering below the surface even as trade volumes increased by about one-half in the first quarter of the nineteenth century.²⁶ After 1824, the trade in London once again began exciting comment and became the subject of public debate. Many of the problems, that the 1807 reform had hoped to resolve, were recurring and the government took a fresh look at the state of the London trade.

Between 1828 and 1829, the Corporation of London recommended abolishing the public measurement system, citing the 'doubtful security' that the system provided in terms of monitoring the quantity of coals actually delivered.²⁷ The parliamentary committees, appointed in 1829 and 1830, also recommended the abolition of the metage system and the substitution of weight measures for the existing volume measures.²⁸

In 1831, legislation abolishing the metage system and directing sale of coals by weight only was introduced.²⁹ Although, most of the trade supported these changes, there were objections that the wetting of coals was likely to distort weight estimates.³⁰ But based on evidence presented, the parliamentary committee concluded that detecting wet coals was relatively simple and that only very wet coals would materially increase weight.³¹ Consequently, this issue and such objections were largely set aside.

III

How can we explain such significant changes in the London coal trade? As far as the metage system was concerned, the Corporation was faced with an agency problem. The city officials had trouble monitoring the effort and commitment of the other meters.³² Sea meters were paid according to each LCh measured and so had every incentive to collude with the first buyers to provide short measure. Further, many land meters had other occupations as publicans and small shopkeepers – partly explaining the many instances of absenteeism reported among the meters.³³ Errant meters were disciplined through prosecution, fines or wage reductions – not always successfully. Additionally, the revenue collected by the land meters just about covered their wages and salaries. In 1829, the City of London faced a deficit of £666 on a metage revenue of £4,962.³⁴ Although the sea meters were a substantial source of revenue,³⁵ the elaborate system of land metage just was not worth it from the City's point of view.

Yet another reason to abolish the metage system revolves around the political economy of taxes on coal. Consumers in London believed that the high price of the commodity was a result of monopolistic practices of the coal owners. The coal owners alleged that it was a result of the numerous duties on coal in London.³⁶ Of the two, the duties and charges on coal were more likely the cause of high retail prices.³⁷ The politically powerful coal owners were able to put sufficient pressure

²⁶ PP 1826-27 Vol. XVIII, p.495.

²⁷ Papers of the committee on coal and corn meters, Jan. 1829 - Jul. 1830, London, CLRO, Coal and Corn Committee Papers, COL/CC/CCN/03/012. Entry for 1 Oct. 1829.

²⁸ PP 1830 Vol. VIII, p.10.

²⁹ Act for regulating delivery of coal, 1831, 1 & 2 William IV C.76.

³⁰ Papers of the committee on coal and corn meters, Sep 1830 - Dec 1831, London, CLRO, COL/CC/CCN/03/013. Report by William Russell dated 9 Jun. 1831.

³¹ PP 1830 Vol. VIII. pp. 68, 81 and 90.

³² COL/CC/CCN/03/012, CLRO. Letter by principal meters dated 1 Oct. 1829.

³³ PP 1830 Vol. VIII. Appendix Nos. 8, 11, 16, 20, & 21.

³⁴ Ibid. Appendix Nos. 8, 10, 11 and 12.

³⁵ In 1829 the city earned over £17,000 on metage revenues of £26,559.

³⁶ COL/CC/04/01/007, CLRO. Report dated 8 July 1828.

³⁷ William J Hausman, 'Cheap coals or limitation of the vend? London coal trade, 1770-1845', *The Journal of Economic History*, 44 (1984), pp. 321-8, at p.327.

on the government to get them to review duties on coal, which led to the abolition of the metage duty.³⁸

In parallel, switching the measurement standard from volumetric units to units of weight made the heaped measure redundant. The Corporation hoped that this would make monitoring the quantity of coal delivered easier. The change of measurement standards was seen to reduce the degree of personal judgement required. The Corporation thus had a viable alternative to replace the metage system with another method – standardized quantities.

Why did the trade in London not voluntarily switch from volume to weight? The first buyers benefited from the ambiguity arising from the heaped measures and the conversion from weight to volume measures. Moreover, for the switch of standards to be effective a significant majority (if not all) of the first buyers would have had to switch over to using weight standards. This would have involved overcoming major coordination issues. Cost of switching does not appear to be very large when compared to the duties and charges that the trade paid to the state annually.³⁹ However, lack of effective commitment mechanisms to eliminate renegeing likely resulted in inertia. The second buyers lacked the cohesiveness and the political power to insist on a change of standard. Thus, the market in London was unwilling or unable to make a switch and coordination problems were overcome only with the reform of the metage system.

IV

Standardized quantities emerged as an alternative to medieval market mechanisms. This change, involving switching to a *de jure* standard, was a negotiated outcome between various groups with different degrees of political powers. The older institutions had become ineffective in reducing transaction costs. When the market faced coordination failure, the state altered the institutional arrangement – the measurement artefacts, rules and practices. Actually, regulation was replaced by a market-oriented mechanism that involved less intervention. Standardized quantities became an institutional instrument by which the market began to regulate itself rather than being monitored from the outside. In conclusion, there was nothing self-evident about using standardized quantities – this was a negotiated construct when older market arrangements were thought to have become ineffective.

³⁸ Although the taxes on coal were fiscally very important to the government, the treasury did not resist the attempts to reduce the charges from coal; Papers of the Court of Common Council, 1830, London, CLRO, COL/CC/06/01/0357/1.

³⁹ Assessment of the expenditure on machinery and equipment, excluding retraining and other conversion costs. Reports of the sub-committees - Vol 1 (1831-1834), London, Coal Meters Committee (CMC), MS 10162. also, Account of duties charged on coals in London, 1833, London, PP Vol. XXXIII.

India and the Great Divergence: assessing the efficiency of grain markets in eighteenth and nineteenth century India

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Introduction

Over the last couple of years, the *Great Divergence* has become one of the most contentious issues in economic history. The debate centres on when and why Western Europe pulled economically ahead of the rest of the world; that is, when and why the Great Divergence in terms of economic performance and structure happened.

Until recently, the widely accepted view has been that Europe's path of economic development was unique already in early modern times. It had better institutions, a scientific culture which led to technological progress, superior commercial organization, and more favourable social structures and demographic patterns. As a result, Europe's economic progress was outstripping that of the rest of the world so that it had become the clear leader in terms of economic performance even *well before* the Industrial Revolution brought about far-reaching structural changes and made Europe's supremacy even more pronounced.⁴⁰

Spearheaded by Ken Pomeranz's *The Great Divergence*, recent years have seen a popularization of a rather different view on this matter. According to this school of thought, which came to be labelled the *California School*, the bifurcation leading to the rise of the west only really happened towards the end of the eighteenth or at the beginning of the nineteenth century, and depended on a relatively sudden shift of relative European and East Asian economic trajectories, rather than a European take-off in the context of long-standing European dynamism versus long-standing Asian stagnation. Before, it is asserted, 'Asia' – particularly China, but also India and other regions – was comparable to Europe in terms of economic performance, as measured by various indicators. This new timing of the divergence of course also affects explanations of the European success vis-à-vis other parts of the world. In these revisionist accounts, the explanations shift away from the traditional factors mentioned above as coal and colonial exploitation take centre stage.⁴¹

One of the features of this debate is that the comparisons are based on fragile evidence. While there is a long tradition of quantitative historical research on economic performance for most European countries, there has been no comparable tradition for Asian countries. Over the last few years, however, the lively debate triggered by the authors above has encouraged various scholars in quantitative economic history to improve the intercontinental comparisons on indicators for economic performance – such as living standards, market efficiency or demography.⁴² This undertaking is still at an early stage and many of the broad conclusions about the efficiency of Asian economies remain to be looked at in greater detail and to be tested quantitatively. Moreover, in these recent studies, it was China that attracted the bulk of attention. Unlike for China, the quantitative investigation for the second of the 'big two' in Asia – India – has hardly begun. Undoubtedly, the prime reason for this shortage of quantitative studies is the paucity of historical economic data, which is much more pronounced for India as compared with European and even some other Asian countries. It is therefore hardly surprising that quantitative studies on all aspects of Indian economic history have mostly been confined to the time after 1860; that is, when the British administration started to systematically collect and publish official statistics. For what may be labelled the 'pre-statistical' period – before 1860 – economic data becomes scanty and is scattered around in numerous sources and regional studies, and nearly no systematic efforts have yet been made to amass

⁴⁰ Probably the best-known writing which represents this view is North and Thomas, *The Rise of the Western World*.

⁴¹ For the *California School* position: Pomeranz, *The Great Divergence*; Frank, *ReORIENT*.

⁴² See for instance Allen et al., 'Wages, Prices, and Living Standards'; Shiue and Keller, 'Markets in China and Europe'.

the economic data available and to explore it in an all-Indian or international context. This is where the present paper comes in. Here, grain prices for eighteenth and nineteenth century India are compiled with the aim of assessing the efficiency of Indian grain markets through time.

The contribution of an enquiry of this nature is twofold: First, as the *quantitative* studies on Indian market integration are presently confined to the time after 1860, such a study signifies a substantial extension back into the pre-statistical era that will help to establish a much more complete chronology of Indian market integration. This is of particular importance in view of the fact that there is, to date, no study at all which looks at market integration in eighteenth century India.

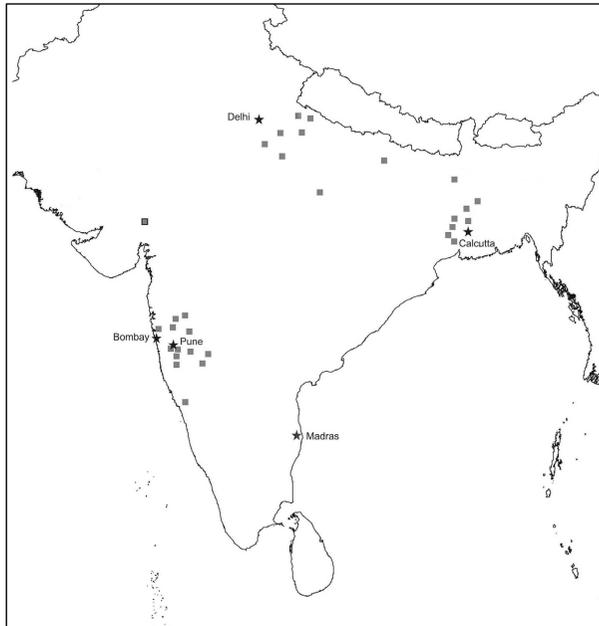
Second, by discussing the results obtained against the background of recent studies on historical market performance in Europe and China, India's place in the *Great Divergence* can be ascertained. Grain market efficiency has featured as one of the prominent indicators for economic sophistication or potency in the Divergence debate. This is understandable, as most economists and economic historians would agree that efficient market structures are both a testimony of economic sophistication and prosperity as well as prerequisites for further economic growth. As a consequence, determining the efficiency of Indian grain markets vis-à-vis their European or Chinese counterparts will help to assess the accuracy of the contradictory claims made by both camps in the debate, positions that ultimately determine the explanations as to why Europe industrialized first. Does the Indian case support the traditional line of argument in that Indian market efficiency was already substantially lower on the eve of the Industrial Revolution? Or are the results in line with the revisionist *California School* argument contending that the extent of trade and the efficiency of grain markets remained comparable in India until the end of the eighteenth and the beginning of the nineteenth centuries?

The Data

For the intended investigation just outlined, grain price quotations, which encompass the period from 1700 to 1914, have been collected from a variety of sources, including government papers, old statistics journals and the secondary literature. The early series are normally based on information from civil or military authorities (both Indian and English), Indian revenue functionaries (mamlutdars), or wholesale traders. Only the two most widely recorded grains – wheat and rice – were included, and the price series represent annual average prices, either for calendar years or for harvest years (June-May). In total, 54 price series for 35 different cities could be compiled for the pre-statistical era (see figure 1). For reasons of temporal comparison, some additional markets for the period after 1860, for which an abundance of price data is available, have been included in the study, so that the final database for the present investigation consists of 70 different price series (36 for wheat and 34 for rice) for 46 cities, which are spread all over the subcontinent.⁴³

⁴³ For a complete description of the price series and all the sources used, please consult the appendix of the full-length version of this paper at www.nuff.ox.ac.uk/users/studer/research.htm

Figure 1: Location of Markets with pre-1860 Price Series



Gauging the Extent of Market Integration

When market areas expand and formerly separated market places become part of one single market, the way prices are determined in these markets fundamentally changes. While prices in totally unconnected markets are determined by local demand and supply, domestic prices equal world prices plus a transport cost in perfectly integrated markets, i.e. prices are determined by the so-called *law of one price*. It is with this in mind that I investigate the efficiency of grain markets and the process of market integration in India, using the newly compiled database of grain prices.

Consequently, I want to determine to what extent these grain prices from different locations show the comparative patterns predicted by the law of one price, that is to say to what extent these prices show the features of well-integrated, efficient markets. These features are:

Price convergence

When formerly unconnected markets come under the increasing influence of the law of one price in the process of market integration, prices in different markets must converge to either a stable price ratio (due to transport costs) or to one single price. In this essay, I use simple graphic analysis to depict the process of price convergence.

Low price volatility

In integrated markets, price volatilities are normally a lot lower than in unconnected markets, as the possibility of arbitrage dampens price shocks. Therefore, I calculate coefficients of variation for long price series.

Linear relationships between price series in different places

Price series in well-integrated markets show co-movement, as they are under the influence of the same price regime. The method used to measure the strength or degree of linear association between two variables is correlation analysis.

Short-term price shocks which are quickly corrected for by arbitrage

If prices in two markets show a linear relationship – as they do in integrated markets – short-term shocks which break down this stable price ratio cannot persist permanently as arbitrage between the markets prevents this. The higher the efficiency of the markets, the faster this error in the equilibrium price ratio is re-established. The speed of adjustment to shocks can be measured using error correction models.

It is of course of particular interest here to see how the presence of these features – that is to say these four indicators of market integration – changed over time and how the situation in India compares to Europe and China.

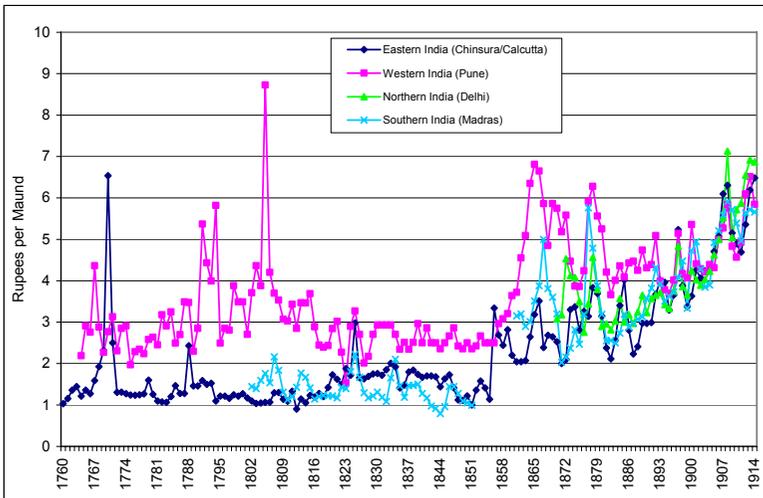
Results and Conclusion

While all four procedures applied to gauge the extent of market integration and to illustrate the process of integration are all complicated by uncertainties or might also indicate factors other than market integration, it is reassuring that the results obtained by all these methods support one another and lead to the same general conclusions. These conclusions furthermore find support in both the general history of India and the mainstream accounts on market integration, and they can be summarized as follows.

Prior to the mid-nineteenth century, the grain trade in India was essentially local, while more distant markets remained fragmented. This is not to say that no grain was traded over longer distances, but the extent must have been very limited, as the prices from some 36 cities all over India still exhibited various characteristics of isolated markets.

First, differences in price levels between markets were very pronounced and persisted until well into the nineteenth century (figure 2).

Figure 2: *Convergence of Rice Prices, 1760-1914*



Second, annual price fluctuations were extremely high in late eighteenth century India, both when compared to European and Chinese markets as well as to the situation in late nineteenth century India (table 1).

Table 1: *Coefficients of Variations*

<i>Wheat Prices</i>	1764-1794	1870-1910
Pune	0.34	0.19
Calcutta	0.79	0.14
Delhi	0.77	0.18
Paris	0.16	0.14
London	0.16	0.14
Gdansk	0.18	
Milan	0.15	0.15
Amsterdam	0.17	0.16
<i>Rice Prices</i>		
Calcutta	0.38	0.18
Pune	0.29	0.12
Yangtze Valley	0.19	0.18
Hiroshima	0.16	

Third, apart from neighbouring villages or cities, price series from different markets did not show co-movements at all before the late nineteenth century (table 2). This, again, is strikingly different from the situation in both Europe and China (table 3).

Table 2: *Price Correlations in India*

N*	Distance range (km)	n**	1750-1830		1825-1860		1870-1914	
			Mean	stdev	Mean	stdev	Mean	stdev
25	<35	14	0.91	0.07				
25	35-70	11	0.46	0.30				
25	70-150	19	0.33	0.16				
25	150-300	13	0.26	0.25				
25	>300	18	-0.01	0.18				
15	<150	12			0.36	0.23		
15	150-300	13			0.35	0.30		
15	300-600	16			0.14	0.30		
15	600-1000	8			0.15	0.28		
15	> 1000	25			0.00	0.24		
20	<300	25					0.76	0.19
20	300-450	17					0.77	0.14
20	450-600	23					0.70	0.17
20	600-1000	35					0.66	0.19
20	1000-1500	75					0.56	0.20
20	>1500	118					0.41	0.21

N* Gives number of markets in a sample

n** Gives number of bilateral relations examined

Table 3: Price Correlations in China and Europe

Place	N*	Distance range (km)	n**	1770-1794		1831-1855	
				Mean	stdev	Mean	stdev
CHINA (Yangtze River)	34	<150	68	0.81	0.09		
	34	150-300	124	0.74	0.12		
	34	300-450	146	0.68	0.1		
	34	450-600	120	0.66	0.09		
	34	600-750	57	0.64	0.1		
	34	750-900	34	0.61	0.11		
	34	900-1050	12	0.57	0.08		
EUROPE	15	<150	17	0.83	0.09		
	15	150-300	15	0.65	0.15		
	15	300-450	13	0.55	0.21		
	15	450-600	20	0.53	0.17		
	15	600-750	14	0.39	0.15		
	15	750-900	11	0.33	0.16		
	15	900-1050	10	0.3	0.09		
	15	>1050	5	0.3	0.1		
	15	<150	8			0.96	0.03
	15	150-300	9			0.94	0.03
	15	300-450	9			0.85	0.07
	15	450-600	22			0.83	0.06
	15	600-750	25			0.78	0.08
	15	750-900	12			0.74	0.02
	15	900-1050	10			0.72	0.04
15	1050-1200	10			0.57	0.12	

N* Gives number of markets in a sample n** Gives number of bilateral relations examined

All the figures are taken from Shiue and Keller, 'Markets in China and Europe', tables 2a and 2b.

Fourth, where prices do show co-movement, adjustment processes to spatial price differentials were exceedingly slow, as captured by the adjustment term γ of equation (1). Adjustment processes were still a matter of several years (see table 4).

Table 4: Error Correction Model

(1) $\Delta \log P_{1,t} = \alpha + \beta \Delta \log P_{2,t} + \gamma (\log P_{1,t} - \log P_{2,t})_{t-1} + e_{1,t}$

N*	Distance range (km)	n**	1760-1830			1825-1860			1870-1914		
			β	γ	R ²	β	γ	R ²	β	γ	R ²
25	<35	14	0.92** (16.70)	-0.68** (-3.08)	0.92						
25	35-70	9	0.66** (5.80)	-0.63** (-2.15)	0.55						
25	70-150	17	0.48** (2.98)	-0.57** (-3.24)	0.41						
25	150-300	13	0.31** (2.21)	-0.32** (-2.42)	0.27						
25	>300	18	0.12 (0.69)	-0.20* (-1.79)	0.16						
15	<150	13				0.64** (2.74)	-0.70** (-2.93)	0.44			
15	150-300	13				0.58** (2.49)	-0.61** (-2.54)	0.39			
15	300-450	6				0.48** (2.54)	-0.43* (-1.96)	0.31			
15	450-600	10				0.15 (0.71)	-0.24 (-1.31)	0.14			
15	600-1000	8				0.22 (0.95)	-0.35 (-1.60)	0.24			
15	> 1000	25				0.25 (1.02)	-0.36* (-1.76)	0.22			
20	150-300	24							0.78** (11.97)	-0.44** (-3.64)	0.67
20	300-450	17							0.79** (10.49)	-0.41** (-3.36)	0.66
20	450-600	24							0.76** (8.92)	-0.54** (-4.45)	0.65
20	600-1000	35							0.72** (7.32)	-0.44** (-3.72)	0.56
20	> 1000	14							0.67** (7.79)	-0.30** (-2.83)	0.58

Average t-ratios in parenthesis

N* Gives number of markets in a sample

** = significant at a 99% level (* at 95%)

n** Gives number of bilateral relations examined

It was in the second half of the nineteenth century that these backward structures got transformed rapidly, so that by the end of the century prices across regions had converged (figure 2), price volatility had been massively reduced (table 1), and prices for even very distant markets showed clear co-movements and adjustments to price disequilibria (tables 2 and 4). Nevertheless, although it may be possible to speak of a national grain market at the turn of the nineteenth century, the formation of an integrated market was still incomplete and showed distinct regional differences.

Turning to the comparative *Great Divergence* discussion, the claim of the *California School* of 'Asia' having a similar economic potency as Europe until the late-eighteenth or early-nineteenth century is rejected. At least as far as India is concerned, all indicators point to lack of economic development until the mid-nineteenth century as measured by the efficiency of grain markets. It seems safe to conclude that by the late eighteenth century, India was already very different from developed parts of the world such as large parts of Europe or some advanced parts in China in terms of market performance. In view of the political history and the state of the transport infrastructure of

the subcontinent, such a divergence between Western Europe and India needs to be shifted at least back to the seventeenth century, if not more.

The case of India indicates that the very generalizing claim about 'Asia' being as economically advanced as Western Europe needs to be revised and replaced by a view that is geographically much more differentiated.

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Integrating natural hazards into economic history: institutional economics and the development of German crop insurance

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1. Introduction

In agriculture, hailstorms are one of the most dangerous occurring natural hazards. They can destroy a year's harvest in minutes. One major response to this hazard has been the invention of crop insurance which has been developed into an important device to deal with the economic consequences of such storms.

In German economic history, research on natural disasters is still relatively scarce. Similarly, German business history has not paid much attention to these hazards and especially their consequences for enterprises. Thus, it has not been sufficiently studied how instruments for risk management have evolved in Germany since the eighteenth century. Concerning the history of German crop insurance, most studies date from the beginning of the twentieth century and analyse the development of this institution only in a descriptive way.⁴⁴

This paper summarizes some parts of my research on the initial stages and the further development of the history of crop insurance in Germany. In the next section I will present the methods I am using. Then I will outline the cultural and socio-economic backgrounds that were responsible for the foundation of crop insurance. Finally, the focus will lie on the development in the nineteenth century.

This paper is based on a selection of German theological, economic and scientific journals from the sixteenth to the nineteenth centuries and combine a historical-anthropological study with an economic approach in the field of natural hazards and insurance.

2. Methodology

In dealing with the cultural and social backgrounds of hazard insurance schemes, the reactions and attitudes of the population towards disasters and the strategies to cope with them should be considered. To achieve this goal, historical-anthropological methods are employed. Such an approach puts human reception and emotions as well as their coping strategies at the centre of analysis. It is important to acknowledge that only human perception makes a natural event a disaster. Only in this context can we learn how human beings were able to create functioning strategies and institutions to deal with disasters and to mitigate their effects in a historical perspective.⁴⁵ For the analysis of the crop insurance market, I use concepts of institutional economics to discuss the behaviour of market participants or market failure.

3. The Background of German Crop Insurance

3.1 A fundamental Change of Perception

From the sixteenth until the eighteenth century, there was a fundamental change of perception with respect to natural disasters and concepts of security. As far as hailstorms are concerned, an analysis of journals and theological tracts shows that up to the seventeenth century, hail was mostly perceived as a scourge of God. The only possibility for human beings to protect themselves was prayer and

⁴⁴ For example N.[ikolaus] Freiherr von Thuemen, *Geschichte des Hagelversicherungswesens in Deutschland bis zum Jahre 1895 und seine gegenwärtige Gestaltung*, Dresden 1896, Walter Rohrbeck, *Die Organisation der Hagelversicherung, vornehmlich in Deutschland*, Berlin 1909.

⁴⁵ Alessa Johns (Ed.), *Dreadful Visitations. Confronting Natural Catastrophe in the Age of Enlightenment*, New York 1999, Anthony Oliver-Smith/ Susanna M. Hoffman (Ed.), *The Angry Earth. Disaster in Anthropological Perspective*, New York 1999.

penitence.⁴⁶ However, theology itself changed its attitude towards nature. Around 1700, the so-called physico-theologians tried to combine Christian doctrine with scientific explanations. Nevertheless, God was still the creator of all natural processes.⁴⁷ But this point of view also lost ground as enlightened ideas gained acceptance. Henceforth, all aspects of nature, including hail, were studied in a rational way and God was less and less needed as a substitute for a sound theory.⁴⁸

For the institutionalization of crop insurance, changing concepts of security also played an important role. Insurance in Germany was not an established institution but was provided to some extent by the churches and guilds until the eighteenth century. In addition, there were forms of maritime and fire insurance, which, however, were only marginal. Early German economists, the so-called Cameralists,⁴⁹ published literature on insurance, partly with the aim of accelerating its implementation. Recognizing the importance of agriculture for economic growth, concepts of crop insurance were issued soon. However, central features of insurance technique were not considered. For example, risk diversification was only a secondary point in their argumentation.⁵⁰

3.2 The Socio-economic Background

The German population totalled approximately 16 to 18 million in 1750 and reached 24 million in 1816, an increase of 33-50 per cent. Furthermore, there were growing possibilities for agricultural export. These developments would have required a commensurate increase in rural production, which could not be realized in the short run. As one consequence, prices increased between 30 and 50 per cent. However, agricultural wages and other costs did not expand as much as prices. For example, in the above-mentioned period, wages rose only by 9 per cent. This price-cost-ratio allowed higher profits in the rural sector. That is why estate values were rising, making protection of agricultural belongings against any kind of menace more and more attractive.

Secondly, the German agrarian constitution had not been reformed since the High Middle Ages. Nearly all peasants were burdened with feudal and seigneurial obligations, which dominated most of their lives. However, there were regional differences: roughly speaking, North-West Germany was characterized by large estates. Many landless labourers had to work on these large farms ('estate agriculture'). In contrast, a large number of smallholders who sold their labour and had only minor access to land were typical for the agriculture in Southern Germany ('peasant agriculture'). At the beginning of the nineteenth century, in Prussia (and later in other German states), there was a reform called the liberation of the serfs. Theoretically, peasants should receive land to cultivate for themselves. In practice, many of them could not afford the compensation payments which had been assessed. Nevertheless, the foundations were laid for farmers to become independent economic entities during the nineteenth century.⁵¹

Theoretically, this was also a point which should have stimulated the demand for coverage. But as we will see, the dissimilar agrarian constitutions cause crop insurance to be implemented at different speeds in Northern and Southern Germany. Also, the transformation of the majority of the peasants into independent economic entities combined with the change in perception went on during almost all of the nineteenth century.

⁴⁶ David Bramer, *Vom Donner, Blitz, Hagel, Sturmwinden und anderen grossen Ungewittern*, Erfurt 1577.

⁴⁷ Peter Ahlwardt, *Bronto-Theologie*, Greifswald 1746, Clarence J. Glacken, *Traces on the Rhodian Shore. Nature and Culture in Western Thought from Ancient Times to the End of the Eighteenth Century*, Berkeley 1967, pp.355-706.

⁴⁸ Lorraine Daston, *Classical Probability in the Enlightenment*, Princeton 1988. Religious explanations of nature continue to exist, however, until today.

⁴⁹ For an introduction to the cameralists see Albion Woodbury Small, *The Cameralists*, New York 1962.

⁵⁰ Johann Heinrich Gottlob von Justi, *Die Grundfeste zu der Macht und Glückseligkeit der Staaten*, Band 1, Königsberg 1760, pp.763-71.

⁵¹ Richard J. Evans/ William R. Lee (Ed.), *The German Peasantry. Conflict and Community in Rural Society from the Eighteenth to the Twentieth Centuries*, London 1986, Friedrich-Wilhelm Henning, *Deutsche Wirtschafts- und Sozialgeschichte im 19. Jahrhundert*, Paderborn 1996, pp.40-127; 634-677.

4. German Crop Insurance in the nineteenth century

4.1 Development until 1914

The first efforts to realize the cameralistic concepts were state-driven. For example, in 1774, the governor of the Prussian province of Magdeburg had plans to start such a new company, but the project was not implemented. Most civil servants were positive about the usefulness and the urgency of such an enterprise but were more reserved because of the lack of precise data.⁵² Finally, in 1791, the first enterprise was able to start business in the principality of Brunswick, which is in Northern Germany. It was organized as a local cooperation of private landowners but was dissolved in 1794 due to the insufficient number of customers and incorrect premium calculation.⁵³

Roughly speaking, there were three periods in the history of German crop insurance before the First World War. Until 1853, all companies except for one were organized as local mutual enterprises. Thereafter, new stock corporations gained ground and dominated the branch for 20 years. Around 1870, a new mutual crop insurance company was founded, which was able to compete with the stock corporations. So, finally, there was coexistence between the two legal forms. Altogether, 88 enterprises were established between 1797 until 1907, nearly all in Northern Germany but 54 of them dissolved during this time, mostly due to incorrect premium calculation and an insufficient risk diversification. The value of the insured crops increased from 306 million Marks in 1853 up to 3.5 billion Marks in 1913.⁵⁴ This fast development was also a result of the growth of agricultural areas and the need to protect the more valuable crop. In 1869, for example, 10 million tons of crops were produced in Germany; in 1907, this sum amounted to 17 million tons.⁵⁵ Why were most of the companies founded in Northern Germany? Mainly because the large landowners disposed of sufficient capital to start such a project.

4.2 Crop Insurance in Southern Germany

The situation in Southern Germany was different from that in the northern part of the country. Such that, market failures can be analysed in a broader way. Only few crop insurance companies were implemented, mainly because the area was more at risk from hailstorms and the mentioned distinction of the agrarian constitution. Due to the large number of smallholders, it was difficult to raise the money for a company foundation. Furthermore, many peasants did not see the need to protect their belongings as most of their possessions were small. Also, agricultural prices were under pressure, especially in the first decades of the nineteenth century. For example, in 1816, average metric quintal wheat cost about 17 Marks but in 1850 the price was only 12 Marks. Only after 1871 did the agrarian prices increase continuously.⁵⁶

Nevertheless in 1833, a private crop insurance enterprise was founded in Bavaria, the 'Hagel-Assekuranz-Verein'. Their premiums should have been based on the regional hail risk of the last 20 years. Such long-term data were not available, however. Consequently, the calculation went wrong and in nearly every year, the insurance claims could not be paid off. For example, in 1843, only 60,000 Marks were distributed while customers were entitled to indemnities worth 351,000 Marks. So it was no wonder that most clients cancelled their contracts. In 1833, the company started with 1,529 customers, and in 1838, 17,150 peasants trusted the 'Hagel-Assekuranz-Verein'. But due to the insufficient payments, the company was not able to build a good reputation. Furthermore,

⁵² Rosenmüller, B., *Versuche zur Gründung einer Hagelversicherungsanstalt in den Jahren 1774 und 1793*, in: *Zeitschrift für die gesamte Versicherungs-Wissenschaft*, 12 (1912), 590-597.

⁵³ Niedersächsisches Landesarchiv 40 Slg 13052; 23 Neu FB. 1 Nr. 1585.

⁵⁴ All mentioned figures are nominal. A deflation would not change the trend significantly.

⁵⁵ Ernst Klein, *Geschichte der deutschen Landwirtschaft im Industriezeitalter*, Wiesbaden 1973, Hans Schmitt-Lermann, *Der Hagel und die Hagelversicherung in der Kulturgeschichte*, München 1984, pp.245-68.

⁵⁶ Wolfgang Zorn, *Kleine Wirtschafts- und Sozialgeschichte Bayerns*, München 1962, pp.37-44.

modifications of the premium calculation were inadequate, mostly due to the lack of long-term data, and in 1855, only 839 insurance policies were held.⁵⁷

As a consequence, different proposals were discussed in order to make the market more efficient. In 1853, for example, the Bavarian agricultural society demanded that a mandatory crop insurance should be established. Furthermore, private companies from Northern Germany should be granted access for doing business in Bavaria. Only the last point was accepted by the government and in 1856 such enterprises were licensed.⁵⁸ However, they had only minor successes, chiefly because of their adamant business policy. Furthermore, most clients from Northern Germany argued that with an expansion of their companies to Bavaria, the risk and premiums for themselves would increase due to the higher local hail danger in the south.

Finally, in 1884, the first state-owned crop insurance company worldwide was founded in Bavaria. The structure and regulations of the new enterprise were created in order to avoid the mistakes of the 'Hagel-Assekuranz-Verein'. It was subsidized by the Bavarian government on an annual base but was not a statutory insurance. Also, only a certain number of peasants in each region were insured in order to create a functioning risk diversification.⁵⁹ Furthermore, the authorities tried to improve the statistical material. For these reasons, the new company soon proved successful. In 1893, for example, 75,700 customers insured crops worth 114 million Marks, whereas in 1900, 126,000 farmers trusted the company and the insurance sum had increased to 194 million Marks. The other private crop insurance companies who still operated in Bavaria profited from this development as well. In 1900, for example, they took care of 38,000 clients.⁶⁰

5. Market Analysis

Why did the early crop insurance companies fail? How could these problems be solved?⁶¹ First of all, cultural factors were important besides economic reasons. The change of attitudes, especially towards insurance, did not reach the majority of the peasants until the middle of the nineteenth century. For example, even in 1883, the Bavarian parliament were critical of farmers who did not see the need for crop insurance.⁶²

At the economic level, there were several important factors: there was not enough capital available in the first decades of the nineteenth century. Furthermore, the premium calculation was inaccurate and the small number of customers did not allow an effective risk diversification. Also, crops were not pooled with other risks.

In a next step, I analyse the market with the tools of institutional economics, regarding the occurrence of asymmetric information. Problems of (ex-ante) moral hazard were not given in this situation because the farmer is not able to create a hailstorm. However, crop insurance is typically subject to insurance fraud, as crops can be hidden from insurance inspectors trying to evaluate the damage. This can be interpreted as an ex-post moral hazard. Even more importantly, there were adverse selection problems. On the one hand, potential clients were unsure about the reliability of a company like the 'Verein'. As mentioned before, the management was not able to build up a reputation in order to mitigate this problem. On the other hand, the enterprise could not rate the exact risk of the individual customer. Especially for Bavaria, the 'Hagel-Assekuranz-Verein' had a

⁵⁷ For the figures see *Eingabe des Vereins an die Kammer der Abgeordneten*, in: *Zeitschrift des landwirtschaftlichen Vereins in Bayern*, 46 (1856), pp.158-9.

⁵⁸ For discussions see *Die dritte Central-Versammlung des landwirtschaftlichen Vereines für Bayern*, in: *Centralblatt des landwirtschaftlichen Vereins in Bayern*, 43 (1853), pp.551-70.

⁵⁹ For details see *Gesetz, die Hagelversicherungsanstalt betreffend*, in: *Gesetz- und Verordnungsblatt des Königreichs Bayern*, 1884, No. 8, pp.61-6.

⁶⁰ For the figures see *Statistisches Jahrbuch für das Königreich Bayern*, 7 (1903), pp.175-6.

⁶¹ Unfortunately, an empirical analysis is not possible due to the lack of data.

⁶² For the discussions see *Verhandlungen der Kammer der Abgeordneten des bayerischen Landtages*. *Stenographische Berichte* 1883/84, I, p.521.

monopoly position before other companies were licensed. However, the 'Verein' could not benefit from this situation.

How could the problems be solved? For Germany as a whole, basic economic conditions improved. With increasing agricultural prices, there was also a rising need for hail insurance. In Bavaria, public help was responsible for the establishment of a functioning crop insurance market. Also, the competitors profited from an increased demand due to this foundation. Adverse selection problems were solved mostly due to the possibility of a regional limitation of customers and the improvement of the statistical material. Furthermore, the reputation of the new enterprise improved partly because of the subsidization. In conclusion, the new company proved successful and the Bavarian peasants gained effective protection.

Summary

This paper has shown that the changing mentalities both of natural hazards and concepts of security were partly responsible for the establishment of crop insurance. Therefore, concepts for such new institutions were published by early German economists and around 1800 more and more companies were founded. In the first decades, we can find typical aspects of insurance market failures such as an inadequate risk diversification. Furthermore due to asymmetric information, adverse selection problems emerged – caused by the insurers' inability to calculate risk-based premiums. Partly by reason of governmental help, partly due to the increasing agricultural prices, these problems could be solved.

Causes and effects of international trade regimes: the Cobden-Chevalier network, c.1860-77¹

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This paper presents first results of a project that conducts a quantitative analysis of the *Cobden-Chevalier network* of bilateral commercial treaties that evolved from 1860 on. In the context of recent discussions on liberalization and trade agreements, we study how the network emerged and became institutionalized, and if and in which way it influenced international trade flows. This paper presents results on the second question.

The Cobden-Chevalier-Network

The *Cobden-Chevalier-Treaty* (1860) closed by France and the UK in 1860 was succeeded by more than 50 bilateral treaties of similar form and content. Its outstanding importance stems from the share of its members in world trade and from its institutionalization: in contrast to today's formal multilateralism, formally it was entirely bilateral. Despite this, the network displayed a distinctly multilateral quality: All treaties contained most of the following stipulations: 1) repeal of import and export duties; 2) maximum duties (25-30 per cent of value); 3) concessions on specific duties; 4) freedom of transit; 5) duration of 10 to 12 years; 6) mutual concession of most-favoured nation (MFN) status; 7) a variety of concessions promoting freedom of commerce. In an increasing number of treaties sealed after 1862, contracting partners explicitly transferred concessions granted in former ones.

In contrast to the UK, France did not generalize its concessions from the original treaty to all trading partners. Thus, the latter aimed at overcoming this implicit discrimination in comparison to Britain and sought to conclude similar treaties with France to support their export industries. Thereby, they caused the discrimination of further outsiders and created incentives for the spreading of the network among their trading partners. On the other hand, all previous contractual partners with MFN status benefited as free-riders from new concessions granted in subsequent negotiations. This facilitated the fast spread of the network, but also caused uncertainties regarding its sustainability: firstly, because the treaties were limited in time, and secondly, because the possibility of free-riding made governments more and more unwilling to grant further concessions. In fact, many of the later treaties contained MFN clauses only, and no further tariff reductions. At the end of the 1870s, a marked tendency towards the revision of concessions could be observed. It was mainly motivated by a cyclical downturn and increasing imports of cheap grain from Russia and the Americas. Although the treaty network persisted until the First World War, it lost much of its original free trade character due to revisions and renegotiations after 1875. Therefore, we focus on the years between 1860 and 1877 (see Accominotti/Flandreau 2006, Marsh 1999, Irwin 1993, Brawley 2005).

Did it lead to a rise in international trade? – State of research, method and data

Our central question is whether an expansion in international trade in the 1860s can be attributed to the treaty network. According to Accominotti/Flandreau (2006), the first paper to comprehensively quantify the effects of the treaty network on international trade, the notion of free-trade bilateralism to have been successful, 'a deeply rooted belief among economists and economic historians', has to be rejected. They estimate a variety of gravity models for 21 countries and every five years from 1850 to 1870.

¹ The project is funded by the Fritz Thyssen Stiftung and supervised by Ulrich Pfister and Carsten Burhop. Advice and assistance was received from the supervisors and Hendrik Buhrs, Christian Flick, Elena Hesselmann, Sonja Lohmann, Annabell Maaß and Hendrik Voß.

In their results, the conclusion of commercial treaties from 1860 on turns up as having had no systematic effect on international trade. Together with similar findings by Rose (2004) on the quantitative non-significance of post-World War Two GATT/WTO for rising trade volumes of their members, this might lead one to the conclusion that commercial diplomacy and international trade institutions do not merit the attention they receive from the public and the social sciences.

To see if there are hidden insights underneath the macro-level of 'overall trade', we re-examine the network applying the same method, but in addition to investigating effects on aggregate trade flows we also look at the industry level and exploratively check the distribution of gains between countries at the industry level.

Our method, the gravity equation, relies on an empirically well proven and theoretically justified model that relates bilateral trade flows between countries i and j at time t (bilateral imports IM_{ijt}) to the incomes of exporter and importer ($Y_i * Y_j$) and the 'economic distance' that separates them, which is proxied by geographic distance between capitals (D_{ij}). For comparability with the cited studies, we use the following specification that adds GDP per capita as an additional parameter to proxy demand structures:

$$\ln(Im_{ijt}) = \beta_0 + \beta_1 \ln(Y_i Y_j)_t + \beta_2 * \ln(Y_i / Pop_i * Y_j / Pop_j)_t + \beta_3 * \ln(D_{ij}) + \dots + \varepsilon_{ijt}$$

We add time effects and time-invariant import-country dummies to account for time trends and unobserved country characteristics. To account for 'cultural distance' not embodied in D_{ij} , we add dummies for common border and common language. Other frequently used independent variables such as 'colonial ties', 'island' and 'landlocked' are omitted because they proved to be of negligible importance.

The Cobden-Chevalier network is modelled by dummy variables that take the value of 1 when a country pair has a most-favoured nation treaty in force and 0 otherwise. In the basic model of aggregate trade, we call this variable 'COBDEN'; it should be identical to the Accominotti-Flandreau specification. For the models at commodity group level, we code a corresponding variable 'CONCESSION' that receives a '1' if concessions on products of the specific industry are granted by an importer in a treaty, explicitly or by MFN. As the MFN clause leads to indirect concessions that are not effectively exploited by producers from particular countries, an additional variable 'ORIGINAL CONCESSION' was coded that only receives a '1' if products of a commodity group are explicitly mentioned in the actual bilateral treaty, excluding concessions via MFN.

To investigate the effects of commercial treaties at the commodity level, we constructed a detailed, 'bottom-up' bilateral trade dataset. At the moment, it contains the values of bilateral imports between the UK, the US, France, Netherlands, Belgium, Austria-Hungary, and 'Germany' on a biannual basis for 1859 to 1869. It comprises data on 21 commodity groups that were established by matching contemporary classifications on today's *Harmonised System*. The commodity groups cover goods like wheat, rye, wool, different sorts of yarns and textiles, iron and steel (see appendix) and an average of 50-65 per cent of the countries' foreign trade. We exclude 'tropical' goods (guano, indigo, cotton, tobacco, etc.) as well as sugar and raw minerals (zinc, copper, coal, etc.). The free ports of Germany (Hanse Towns) and Austria-Hungary (Trieste) were treated as entrepôts and have been incorporated into their *hinterland* customs area (Zollverein, Austria-Hungary). The countries of origin and destination of maritime trade of the Zollverein and Austria-Hungary that passed these ports were assigned using the official statistics of Hamburg, Bremen and Trieste.

National statistics of the Netherlands, the Zollverein, and (partly) Austria-Hungary were corrected for known shortcomings in the valuation of goods. We compared unit values of bilateral imports and exports and re-estimated values based on partner countries' records that contemporaries affirmed to be reliable (Bremen, Hamburg, UK), and on contemporary estimates for the Zollverein. In a feasibility study, we tested with data for 1865 if the corresponding records on the same bilateral trade flow by importer and exporter matched satisfactorily. The tests confirmed the reliability of the

data, showing high correlation coefficients and no systematic differences between importer and exporter data (as measured by Wilcoxon Signed Rank Pair Tests).²

For contemporaries it was common knowledge that the 'countries of origin' recorded mainly referred to the last land border crossed or the ultimate port visited. Therefore, a comprehensive 'transit correction' has been undertaken to avoid that bilateral trade volumes of neighbouring countries appear as systematically higher than appropriate. Using transit and re-export statistics, we calculated the proportion of partner countries' special exports (from the home marked) to transit and used this figure to calculate the share of both flows in the importer's recorded values. Among others, this allowed us to allot British imports of silk ribbons from the Netherlands as originating from the Zollverein, and a big portion of British imports of grain from Prussia as originating from Russia.

The data for income, income per capita and distance was taken from the same sources as used in Accominotti/Flandreau (2006),³ except for Germany, where the Burhop/Wolff (2005) NNP compromise estimate was used. A list of treaties was assessed from Glier (1905); treaty texts were obtained from the *Consolidated Treaty Series*.

Estimations and findings

We estimate four specifications of the gravity equation, always applying OLS with importer and time effects. The specifications differ only in the import data and the treaty dummies used. Specification 1 works with aggregate trade (sum of all commodity groups) and the COBDEN variable; it replicates Accominotti/Flandreau (2006). Specification 2 pools the disaggregated data on all commodities and uses COBDEN (a '1' for all commodities if a treaty is in force), CONCESSION and ORIGINAL CONCESSION alternatively. This allows us to investigate the effects of concessions more precisely, as not all treaties contained concessions on all goods. We include commodity-fixed effects to account for good-specific characteristics. Specification 3 conducts 21 separate estimations, one for every commodity group, using CONCESSION and ORIGINAL CONCESSION. Additionally, we run a set of estimations at the commodity level, each time including one interaction term of CONCESSION with the exporter dummy of a network insider (for example, CONCESSION*FRAEX). Thus, we aim to identify if specific industries of certain countries benefited especially.

Table 1 shows the highly similar results for specifications 1 and 2. Two main results can be discerned: the non-significance of the network for international trade at the macro-level found by Accominotti/Flandreau is reproduced; the coefficient of the COBDEN variable in neither specification is significantly positive. Furthermore, the coefficients of the time-effects are also insignificant; the growth in intra-European and transatlantic trade can be systematically attributed only to growth in national incomes. This is also to be found in the Accominotti-Flandreau results, although not highlighted by the authors.

In contrast, we find significantly positive coefficients in specification 2 for both CONCESSION and ORIGINAL CONCESSION with the latter having a higher coefficient and lower standard errors.

These results are confirmed by our estimations for specifications 3 and 4 (not reported). For raw materials such as wheat, rye, milling products, wood, wool, silk, hides/skins/leather that already benefited from low tariff levels before 1860, no systematic effects of the treaties can be found. The same is true for woollen and worsted yarns, cotton cloth, linen yarn, linens, pig iron and bar iron/steel. But for wine, silk wares/fancy articles, and for articles of leather and rubber, the coefficients are significantly positive for the CONCESSION as well as the ORIGINAL CONCESSION variables. In the woollens and worsteds model, the CONCESSION coefficient is significantly positive; the same occurs for the ORIGINAL CONCESSION coefficient in the spirits/liqueurs model. For cotton yarn the coefficients of both variables are significantly negative,

² Results cannot be reproduced here, but more detailed information is available (in German) on request from the author.

³ I am indebted to Professor Marc Flandreau for providing the dataset, of which GDP data was used here.

reflecting the US Civil War that brought along a profound shortage in cotton supply. In conclusion, for most commodity groups the treaties led to no systematic effects, while particular industries that were locally concentrated and well organized (Lyon and Krefeld producers of silk articles, and wine growers) seem to have profited systematically.

Our exploratory investigation of the effects on national producers at the commodity level (specification 4) sustains these results: French and German exporters of silk wares/fancy articles as well as those of wine from France benefited significantly from concessions. Other commodity groups with significantly rising exports are French spirits and liqueurs, German and British rubber and leather goods, Dutch and British woollens and worsteds, British and German cotton yarns(!) and cotton textiles, German linens and Austrian (Bohemian) glass, as well as British and German bar iron/steel and iron and steel wares. For raw materials almost no significant effects are found.⁴ We also locate some significant decline of exports of particular goods, for example, wine, spirits and silk wares from the UK, spirits from Belgium, woollen and worsted yarn from the Netherlands, cotton yarns from the Netherlands, Belgium and Austria, woollens from Austria-Hungary,⁵ cottons from Belgium, and linens, bar iron/steel and iron wares from France. While some of these results might be related to higher home consumption, many go along with an expansion of exports in other countries and allude to deepened international specialization.

Overall, our 'bottom-up' approach confirmed the findings on the non-fostering of international trade by the network at the macro level and showed that increased trade has to be related mainly to income growth. However, we were able to show that for certain commodity groups specific concessions were accompanied by an increase in international trade. Especially, exporters of some countries in manufacturing industries and alcoholic beverages benefited. This confirms that commercial diplomacy did not lead to overall and uniformly-distributed gains from bilateral liberalization, as free traders would have preferred, but suggests that export lobbies did matter.

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⁴ Positive effects are found for hides/skins/leather and wool from the Netherlands and negative effects for wool and silk from Austria-Hungary. The former might be increased amount of disguised transit (cf. Lindblad/van Zanden 1989), while the latter can be related to the wars Austria lost in the 1860s, as they led to the separation of the Lombardo-Venetian Kingdom from the Habsburg Empire.

⁵ Venetian tapestry?

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Gravity estimation results (preliminary)

Variable	Specification 1		Specification 2		Specification 3		Specification 4	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
C	-4.78	0.0140	-10.51	0.0000	-10.59	0.0000	-10.11	0.0000
LOG(GDPIM*GDPEX)	0.72	0.0000	0.66	0.0000	0.64	0.0000	0.62	0.0000
LOG(GDPCAPIM*GDPCAPEX)	0.06	0.7564	0.11	0.2040	0.12	0.1799	0.12	0.1670
LOG(DISTANZ)	-1.08	0.0000	-0.76	0.0000	-0.71	0.0000	-0.70	0.0000
LANGUAGE	0.65	0.0011	0.30	0.0002	0.27	0.0009	0.24	0.0031
BORDER	0.54	0.0142	0.40	0.0000	0.41	0.0000	0.37	0.0001
COBDEN	-0.10	0.5944	-0.08	0.3119				
CONCESSION					0.21	0.0148		
ORIGINAL CONCESSION							0.33	0.0008
D1861	0.06	0.7660	-0.09	0.3676	-0.11	0.2344	-0.12	0.2072
D1863	0.09	0.6843	-0.03	0.7408	-0.08	0.4189	-0.07	0.4401
D1865	-0.14	0.5524	0.02	0.8839	-0.09	0.3747	-0.08	0.4141
D1867	-0.07	0.7835	0.04	0.7066	-0.10	0.3407	-0.07	0.4921
D1869	0.10	0.6897	0.13	0.2502	-0.02	0.8721	0.02	0.8540
BELIM	-0.35	0.1728	0.17	0.1355	0.15	0.1739	0.19	0.0846
GBIM	0.47	0.0509	0.35	0.0009	0.43	0.0001	0.44	0.0000
AUTIM	-0.95	0.0003	0.02	0.8436	0.07	0.5888	0.08	0.4910
ZVIM	0.42	0.0847	1.25	0.0000	1.34	0.0000	1.31	0.0000
NLIM	0.70	0.0122	0.62	0.0000	0.65	0.0000	0.68	0.0000
USAIM	1.75	0.0000	1.62	0.0000	1.68	0.0000	1.67	0.0000
WHEAT			1.48	0.0000	1.53	0.0000	1.53	0.0000
RYE			0.33	0.0854	0.37	0.0543	0.37	0.0503
MILLING PRODUCTS			1.02	0.0000	1.06	0.0000	1.06	0.0000
SPIRITS/LIQUEURS			-0.30	0.0847	-0.31	0.0685	-0.29	0.0929
HIDES. SKINS. LEATHER			1.56	0.0000	1.56	0.0000	1.55	0.0000
WINE			0.25	0.1444	0.24	0.1626	0.26	0.1337
WOOD			0.92	0.0000	0.92	0.0000	0.95	0.0000
WOOL			1.71	0.0000	1.71	0.0000	1.72	0.0000
WOOLLEN AND WORSTED YARN			1.00	0.0000	1.00	0.0000	1.00	0.0000
WOOLLENS AND WORSTEDS			1.55	0.0000	1.55	0.0000	1.55	0.0000
COTTON YARN			0.30	0.0890	0.30	0.0868	0.30	0.0849
COTTON CLOTH			0.61	0.0002	0.61	0.0002	0.61	0.0002
LINEN YARN			0.84	0.0000	0.84	0.0000	0.84	0.0000
LINENS			-0.01	0.9749	0.00	0.9946	0.00	0.9990
SILK			0.88	0.0000	0.88	0.0000	0.90	0.0000
SILK WARES. etc.			1.52	0.0000	1.51	0.0000	1.52	0.0000
LEATHER/RUBBER ARTICLES			0.12	0.4691	0.10	0.5223	0.12	0.4701
PIG IRON			0.23	0.2240	0.23	0.2128	0.24	0.1967
BAR IRON/STEEL			0.49	0.0035	0.50	0.0033	0.50	0.0030
IRON WARES			0.31	0.0597	0.30	0.0689	0.32	0.0560
Obs		252		3745		3745		3745
Adj R ²		0.647		0.270		0.271		0.272
Log likelihood	-340.47			-7152.20		-7149.71		-7147.04

Commodity groups

Wool; Woollen and worsted yarn; Woollens and worsteds; Cotton yarn; Cottons (cloth, fabrics, stuffs); Linen yarn and thread; Linens (and cloth of flax and jute); Silk (raw, floss, sewing); Articles of silk (incl. mixed, and laces, trimmings, ribbons, tulles, muslins and embroidery of other materials); Hides, skins and leather; Articles of leather and rubber; Glass and Glassware; Wood, lumber and timber (incl. firewood, excl. dyewood & tropical); Pig Iron (and scrap iron); Bar iron and steel (incl. plates, wires, rails, tinplate, etc.), rough products of iron and steel (chains, tubes, anvils, nails, screws, structures, etc.); Wheat; Rye; Milling products; Spirits and liqueurs; Wine.

The second age of steel: defining the era of alloy steels, 1858-1914

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Since Christian Thomsen defined the Stone, Bronze, and Iron Ages, these archetypes have served to define material cultures' various stages of development. Ashton and others subsequently established that iron yielded, from Bessemer onwards, to carbon steel. What they failed to note is that, contemporaneous with the emergence of heavy engineering quantities of cheap carbon steel, a second group of materials emerged that presented a second shift at least as significant. These materials were the earliest commercial alloy steels. In them one sees all of the characteristics that define material eras. If Bessemer's converter and the Siemens-Martin open hearth comprised one shift in the primary engineering material base, so too did the alloy group. However, historical significance of the alloy steels has been muted because they have usually been incorporated into the larger steel industry. Using tungsten and high-manganese steels as examples, I will explain why the alloy steels have escaped the radar of economic histories of the iron and steel trades, and why the group merits consideration as a new material era.

To understand the significance of alloy steels compared to carbon steels, comparison criteria must first be established. Here the ideas of 'basic innovation' and 'macroinvention' are essential to contextualizing the significance of the new steels. According to Gerhard Mensch, basic innovations in their broadest definition generate new industries.⁶ Operating on Schumpeter's thesis that innovation is distinct from invention because inventions are economically irrelevant if not commercially produced, Mensch proposes several criteria for innovation at large.⁷ Firstly he defines three types of innovation: basic, improvement, and pseudo. Basic give rise to new industries, while improvement develops or refines an established area of activity, and pseudo presents the semblance of innovation, but without economic utility.⁸ What this idea misses, though, is that not all major innovations are basic innovations by these guidelines.

As Mensch noted, heavy steel represented a series of basic innovations.⁹ However, by his own definition, these same innovations could equally be improvement innovations. The basic innovations of Bessemer and Open Hearth steel might be seen as merely improvement innovations on crucible steel technology. This is patently untrue; they changed the form, cost, application, and breadth of the steel trade, at the same time meeting the concept of improvement innovations.¹⁰ Mensch proposed that improvement innovations provide a product superior to its ancestor in quality, reliability, ease of use, raw material use, labour cost, and other lesser traits. They also account for new, better production techniques that allow products to become more reliable, of better quality, or available in larger quantities at a lower price.¹¹

Joel Mokyr's theory of macro- and microinventions clarifies the alloy situation. In his model, microinventions define the small, incremental steps that improve, adapt, and streamline existing techniques in use, while macroinventions represent radical new ideas without clear precedent.¹² Applying Mokyr's concepts to Mensch's innovation theory, we see that basic inventions can and

⁶ Gerhard Mensch, *Stalemate in Technology: Innovations Overcome the Depression*. (Cambridge, MA: Ballinger Publishing Co., 1979) pp.122-3.

⁷ Joseph A. Schumpeter, *The Theory of Economic Development*. (Oxford: Oxford University Press, 1961) p.88.

⁸ Mensch. *Stalemate*, pp.47-50, 56-62.

⁹ Mensch. *Stalemate*, pp.124-6.

¹⁰ *Ibid.*, pp.47-8, 124-6.

¹¹ *Ibid.*, p.47.

¹² Joel Mokyr, *The Lever of Riches: Technological Creativity and Economic Progress*, (Oxford: Oxford University Press, 1990) p.13.

often do present the characteristics of improvement innovations. While the Bessemer and Open Hearth furnaces presented a new means of creating carbon steel, they were so radically different that a new, heavy steel industry emerged. Thus, a macroinvention, the invention of heavy carbon steel is also a 'basic' invention in Mensch's model, while still retaining 'improvement' characteristics. In alloy steels' case, these innovation themes are also at work, at a much smaller scale.

The prime reason underlying the lack of recognition for the significance of alloy steel is because they were always a small, specialist industry when compared to the heavy carbon steel or iron trades. In 1913 US alloy steel use was approximately 308,500 tons of all types. While impressive, it looks decidedly tiny compared to the 31,463,000 tons of heavy carbon steel consumed that year.

Cost restricted alloy steels' use in structural applications. Alloys could produce long-term savings in materials and their associated costs, work carbon steel, or provide unique physical properties unattainable with other materials at a similar cost. Most heavy engineering projects did not rely on heavy alloy steel structures, with a few notable exceptions. Rather, alloy usage was catalytic. Small quantities of these ultra-specialized metals were used in applications where they made other newly emergent technologies possible. Though there were many different alloy steels involved in the wider discussion of this new industry, I will only discuss two here. The first was representative of those alloys used to work mild steel; the second represents these new metals in their own right for structural purposes where they replaced carbon steel. High-speed (tungsten) tool steel and Hadfield's manganese steel represent archetypes of the alloy trade. Both show the dual nature of alloys in engineering, offering irreplaceable properties even as cost restricted their uses.

Robert Forester Mushet took out his patent for tungsten steel in 1857, and then spent 10 years working to make it reliable and commercially viable. His 1870 commercial composition was the first successful alloy steel for machining applications.¹³ Then, in 1898, Bethlehem Steel's F.W. Taylor and Maunsel White created a watershed in high-speed tool steel. Initially a tungsten-chromium composition, it subsequently incorporated vanadium, which touched off an industrial whirlwind.¹⁴

High-speed steel's introduction to the factory system quickened mass production of mechanical goods more than anything else over the twentieth century's first decade. High-speed steel had a social and material production impact that revolutionized the machine tool trades. Simultaneously, tungsten prices made sure that high-speed steel was the most expensive alloy in widespread commercial before the First World War. While vastly expensive compared to its competitors, high-speed steel's service life was orders of magnitude greater than carbon bits. Unfortunately, the machine tools available in 1900 needed several years to catch up.

Economy in machining operations was one of the factors underpinning widespread mechanization. Nonetheless, high-speed steel's expense limited its use to tool bits and other small, temperature-resisting items such as exhaust valves. This does not mean, however, that high-speed steel did not meet the 'basic innovation' criteria of industry creation. Besides creating the modern machining and its machine tool supply trade, high-speed steel created the commercial tungsten mining industry. Demand made tungsten production take off; over 95 per cent of the world's output was dedicated to alloys.¹⁵ However, tungsten was only available in complex, combined ores that provided unique and often confounding processing challenges.¹⁶ Tungsten's mining industry had high costs due to the highly uncertain nature of the ore bodies and tungsten ores' complex mineralization. Tungsten ores were always irregular, with little known of the persistence of the mineralization at depth.¹⁷ This made the mining and estimation of reserves erratic and unreliable. Prices shot up year-on-year as the new high-speed steel alloy used all the tungsten available.

¹³ Anon., 'Tool Steel.' *Ryland's Iron Trade Circular*, 9 April 1870, p.228.

¹⁴ J.M. Gledhill, 'The Development and Use of High-Speed Tool Steel', *Journal of the Iron and Steel Institute*, vol. 66, no. 2, p.128.

¹⁵ R.H. Rastall and W.H. Wilcockson, *Tungsten Ores*. (London: Imperial Institute, 1920).

¹⁶ M.T. Taylor, 'Separation of Wolfram from Tin', *The Mining Magazine*, vol. 12, no. 6, June 1915, p.351.

¹⁷ Rastall and Wilcockson, *Tungsten*. p.5.

While high-speed steel demonstrates how a new alloy could create multiple new industries, thus reflecting the 'basic innovation' nature of alloy steels, it was always minimal in terms of output. Costs and prices were high, thus tungsten structural steels were never used. This status is not true of Hadfield's Manganese Steel, the archetypal heavy structural alloy.

Robert Abbot Hadfield's curiosity concerning the Terre Noir Company's 1878 production of high-metal content ferro-manganese led to Hadfield's Manganese Steel of 1882. His new alloy confounded common physical standards expectations. His 13 per cent high manganese steel should, according to earlier experiments, have been very brittle. Strangely, Hadfield's metal was extremely tough, yet ductile.¹⁸ Further, it possessed a curious property Hadfield described as work-hardening.¹⁹ Additionally, manganese steel was extremely resistant to magnetic induction.²⁰ Hadfield's search for the answers to these backwards physical properties led to the twin pillars of scientific metallurgy: chemistry and metallography. Unlike high-speed and Mushet's tungsten steels, Hadfield's alloy was not limited by material cost, but by its difficult treatment regimen.

Hadfield's low-cost, difficult-to-process alloy was possible because it did not need a new extractive industry to fuel its production, unlike tungsten. Rather, manganese steel was able to take full advantage of the mature ferro-manganese industry. Hadfield was fortunate that his new alloy used the same high-metal content ferro that was indispensable to the new open-hearth process.²¹ Thus, unlike high-speed steel requirement for tungsten, the introduction of commercial manganese steel had no real impact on mineral output. There was a rise in output of manganese in the 1890s, but this was entirely due to the preference for the open-hearth process over Bessemer steel. US manganese steel output hit a 1913 peak of just under 40,000 tons: just 0.12 per cent of carbon output that year.²² Hadfield's manganese steel does not, therefore, qualify as a 'basic innovation' like tungsten. Rather, manganese steel's characteristics of macroinvention, for this steel changed the way the industry thought about and produced its metals altogether, lent it claim to 'basic innovation' status.

Manganese steel was one of the most heavily used of all the alloys, especially in mining and railways. Mining made use of manganese steel both in and out of the mine. Its first commercial use was the 1888 production of link pins for dredge buckets.²³ Their utility proven in this severe service, this alloy found further widespread mine applications. These included drag-line and shovel buckets and cable wheels in open pit operations, and similar uses in general excavation.²⁴ The key was manganese steel's work-hardening property, which meant a three to five-fold extension of service life for components that were exposed to slow abrasive wear.²⁵ This same property meant manganese steel shone even brighter in mills processing ores. Railway components also made comparable use of manganese steel. Hadfield's ductile, tough, and work-hardening manganese alloy resisted track wear far better than its carbon-steel competitors.²⁶ Though initially more expensive, its vastly longer service life guaranteed manganese steel's widespread application.²⁷ This tiny flavour of the multiple applications manganese steel saw in engineering use does not, however,

¹⁸ Robert A. Hadfield, 'On Manganese Steel,' *Journal of the Iron and Steel Institute*, vol. 34, no. 2, 1888, p.45.

¹⁹ *Ibid.*, pp.45, 50-4.

²⁰ *Ibid.*, pp.56-7.

²¹ Robert Hadfield, 'The Development of Alloy Steels' in L.P. Sidney (ed.) *Proceedings of the Empire Mining and Metallurgical Congress*. (London: Empire Mining and Metallurgical Congress, 1925) pp.122-4.

²² See Figs. 1 and 2 (which will be included in the presentation of the paper at Exeter).

²³ Robert A. Hadfield and T.H. Burnham, *Special Steels: A Concise Treatise on the Constitution, Manufacture, Working, Heat Treatment, and Applications of Alloy Steels*, (London: Sit Isaac Pitman and Sons, Ltd., 1933) p.9.

²⁴ Walter S. McKee, 'Manganese-Steel Castings for Mining', *The Iron Age*. vol. 96, Dec. 9, 1915, p.1362.

²⁵ Walter S. McKee, 'Manganese-Steel Castings in the Mining Industry', *Transactions of the American Institute of Mining Engineers*, no. 108, Dec. 1915, pp.2407-11.

²⁶ C.B. Bronson, 'Heat Treatment of Railroad Materials,' *The Iron Age*. vol. 104, July 3, 1919, p.26.; Robert A. Hadfield and T.H. Burnham, *Special Steels: A Concise Treatise on the Constitution, Manufacture, Working, Heat Treatment, and Applications of Alloy Steels* (London: Sit Isaac Pitman and Sons, Ltd., 1933) p.103.

²⁷ Bronson, 'Heat Treatment', pp.25-6.

account for the radical new trait that made this metal a part of the ‘basic innovation’ trend of the alloys. This lay in the drive to produce a reliable manganese steel in the first place.

As mentioned, the claim of manganese steel to the title of ‘basic innovation’ is due to the way it changed how industry professionals thought about the nature of steel. Hadfield’s manganese steel researches rewrote steel research methodology single-handed. It drove subsequent alloy development by integrating chemistry and metallography into industry practice. The work of chemists on metals was nothing new in the 1880s. Academic scientists like Faraday, had worked with metals and their alloys, but this work had no immediate application in commercial metallurgy.²⁸ Hadfield changed all this in 1882.

Though not a professional chemist, Hadfield studied chemistry all his life.²⁹ He perfected the exacting analytical skills needed to develop many alloy steels. This interest led Hadfield to successfully apply chemistry to practical metallurgy when he set up the first in-house research laboratory in 1892.³⁰ This became a characteristic of all significant steel works, providing quality control, in-house testing, and a research and development capacity previously lacking. Hadfield did not rest here, though. In his search to understand and refine manganese steel, he introduced one of the most potent tools available to metallurgical investigation: the study of metallography.

Also known as microscopy, metallography brought Hadfield’s application of scientific methods to the study of metals to the fore. This science, the study of the micro-constituents of metals via optical devices, was new to the steel trade. Hadfield himself did not invent metallography, but he did introduce its use to practical steel manufacture. Dr. Henry Clifton Sorby, of the University of Sheffield, researching minerals and rocks, first investigated photomicroscopy in 1863.³¹ His work adapted the optical microscope to study crystallization in opaque substances, and in 1886 Hadfield engaged Sorby to determine why his manganese steel was non-magnetic.³² Instead, he discovered the crystalline structures iron forms with carbon at different treatments and temperatures, which became a cornerstone of metallurgical knowledge in steelfounding.³³ With his new knowledge, and in concert with other metallurgists abroad, Hadfield’s carbon-led theory of steel emerged. For the first time in history, metallurgists could reliably predict the results of heat treatment upon steel. Thus manganese steel meets the necessary criteria; Hadfield’s investigations proved the inception point of modern steel metallurgy, yielding a theoretical understanding of all steels since.

If cultures are defined by the material base embodying their development, then it is safe to say that the Era of Steel was really the Era of Alloy Steels. While Bessemer and Siemens opened the door with cheap mild steel, the special steels drove subsequent technological innovation. Without alloys, many things taken for granted today could not have evolved. The modern world owes its very shape largely to the commercially successful alloys developed prior to 1914. With their great impact, then special steels met the same qualifications that previously defined the importance of the Era of Steel. In demonstrating the ‘basic innovation/macroeinvention’ status of high-speed and manganese steels, I have at least touched on this standing. The catalytic effect that these steels had was enormous; they drove multiple new technologies, improved productivity and lowered costs. These two metals, and their half dozen contemporary commercial alloys, were responsible for more material change than any other substance between Bessemer and the synthetics revolution in the 1930s. Adopted world-wide, steel alloys presented more than just new materials. Their development

²⁸ Robert Abbot Hadfield, *The Work and Position of the Metallurgical Chemist*, (London: Charles Griffin and Co., Ltd., 1922) p.22.

²⁹ *Ibid.*, pp.19-20. Geoffrey Tweedale, ‘Sir Robert Abbott Hadfield F.R.S. (1858-1940), and the Discovery of Manganese Steel’. *Notes and Records of the Royal Society of London*, vol. 40, no. 1. p.63.

³⁰ Geoffrey Tweedale, *Sheffield Steel and America: A Century of Commercial and Technological Interdependence*, (Cambridge: Cambridge University Press, 1987) p.61

³¹ Henry Clifton Sorby, ‘The Application of Quantitative Methods to the Study of Rocks’, *Quarterly Journal of the Geological Society*, vol. 64, no. 2. pp.212-32. Robert A. Hadfield, *Metallurgy and its Influence on Modern Progress*, (London: Chapman and Hall, Ltd., 1925) pp.31-2.

³² Hadfield, *Metallurgy*, pp.32-3.

³³ Hadfield and Burnham, *Special Steels*, p.18.

yielded an entirely new means of scientific material investigation, and between these two effects, they deserve consideration as defining a new era. Alloy steels are responsible for the shape of the modern world.

On the origins of the Atlantic Economy: five stylized facts about the American grain invasion of Britain, 1829-1929³⁴

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1. Introduction

Nothing can come of nothing ...
- *King Lear* (I, i, 92)

By the 1870s the United States had emerged as a major supplier of wheat, and Europe was the main recipient of that supply: the so-called American grain invasion. This development of an 'Atlantic Economy' has been seen as central to the history of the pre-First World War 'first era of globalization'.

The dominant explanation for the growth in wheat trade has until recently been that of falling transportation costs (O'Rourke & Williamson 1999). However, Persson (2004) found that the fall was not large enough plausibly to be the only factor involved in the enormous expansion of trade. What then was the origin of the Atlantic Economy? This paper, by a careful documentation and econometric analysis of the available evidence, suggests some answers.

The analysis is based on a new database of variables, which might be considered relevant for explaining the growth in UK wheat imports from the US in the century from 1829-1929. This is a natural choice of period, given that 1828 marked the end of prohibitive tariffs in the UK (Sharp 2006) and the 1930s saw their return.

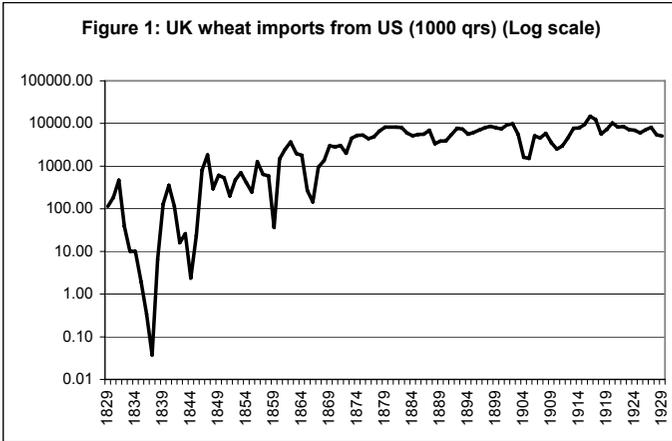
Section 2 presents some graphs of the variables and suggests some 'stylized facts' about the transatlantic wheat trade. Section 3 discusses the theoretical relationships between these variables that might be expected. Section 4 gives a brief introduction to the empirical modelling and methodology that is used in section 5, where the theory of section 3 is tested using cointegration analysis and additional results are also reached. Section 6 concludes.

2. Stylized facts about the wheat trade between the US and the UK 1829-1929

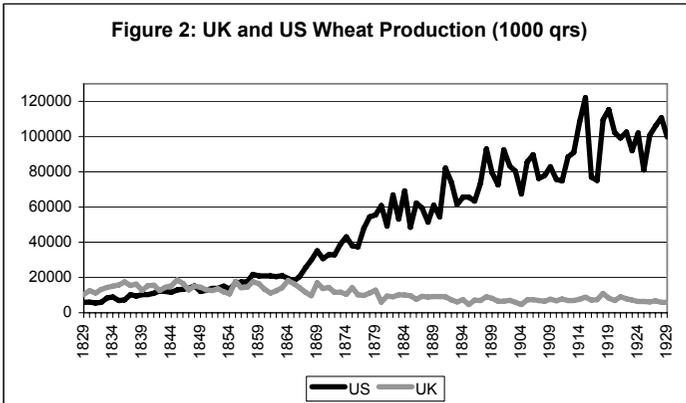
Four stylized facts about the Anglo-American wheat trade emerge through a documentation of the available data (for sources see the data appendix).

³⁴ This paper is a draft and must not be quoted without the permission of the author.

Stylized fact no. 1: *UK imports of wheat from the US increased exponentially from the 1830s to the early 1870s, from which point they were relatively stable*

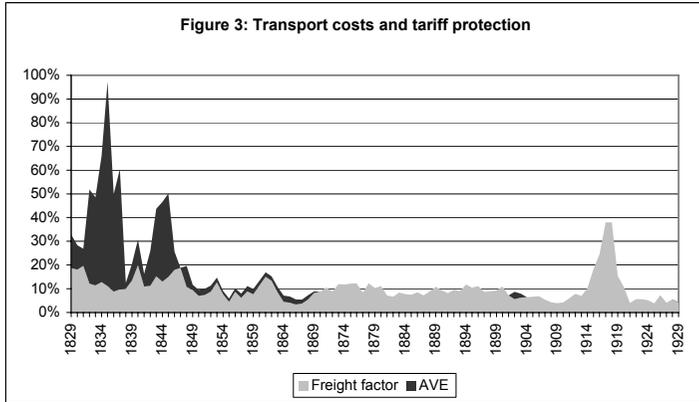


Stylized fact no. 2: *US production of wheat increased whilst UK production fell*



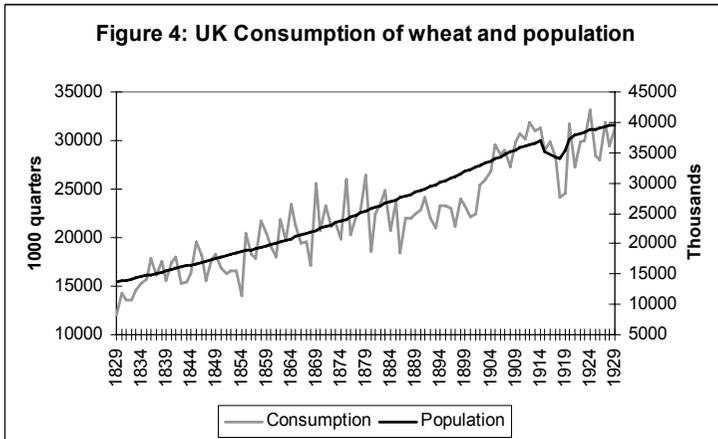
The last year when UK production exceeded that of the US is 1855.

Stylized fact no. 3: *The barriers to trade represented by transport costs and the legislative protection afforded by the Corn Laws fell until the 1850s, after which they were relatively stable*



The freight factor is defined as the cost of transporting a unit of wheat from the US to the UK as a percentage of the price of wheat, i.e. the transport cost expressed as an *ad valorem* duty (see Persson 2004). The AVEs are the *ad valorem* equivalents of the Corn Law tariffs (see Sharp 2006).

Stylized fact no. 4: *The demand for wheat was increasing in the UK as population increased*

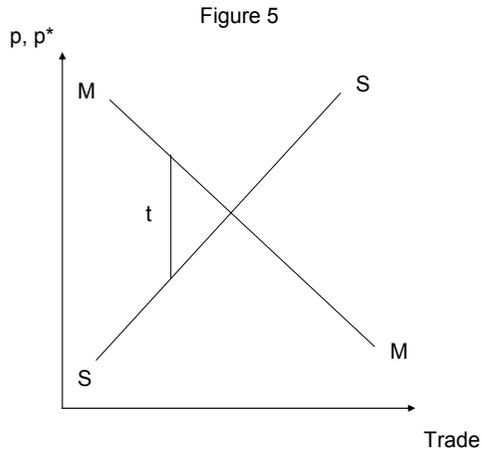


Consumption is assumed to be equal to total UK production plus total imports.

A fifth stylized fact will be stated as the conclusion to the econometric analysis in section 5.

3. The theoretical background

The most widely used theory for explaining the growth of trade in this period can be summed up by figure 5. The MM schedule is the UK's home import demand function (i.e. demand minus supply). It is falling with the home market price, p . SS is the US export supply schedule (supply minus demand) and is increasing in the price abroad, p^* . The law of one price states that, in the absence of any sort of barriers to trade, then p should equal p^* in equilibrium. Any difference in prices would lead to short-term arbitrage, which would return the economy to its equilibrium state. However, with barriers to trade, for example tariffs and transportation costs, a wedge, t , is driven between export and import prices – the higher the barriers to trade, the larger the wedge.



The popular explanation for the expansion of the transatlantic wheat trade concentrates on the role of falling transatlantic transportation costs (see for example O'Rourke & Williamson 1999). Harley (1986, p.238) provides some of the original work on this. His hypothesis is simple and can be understood by imagining an inward shift of the transport cost 'wedge' in figure 4. The old import price, p , now corresponds to a higher price (minus transport costs) for the exporting region. This implies that the quantity supplied by the exporting region will increase. *Ceteris paribus* this will result in excess supply in the importing region leading to a decline in price. At the same time, the old price, p^* , in the exporting region now corresponds to lower price in the importing region, thus leading to excess demand and pushing up the price in the exporting region. Import prices have thus fallen, and export prices have risen. Supply in the exporting region will increase and domestic supply in the importing region will decrease.

An alternative is to focus on shifts in the curves. An obvious point is that in the nineteenth century, the United States was experiencing rapid growth of population through immigration and simultaneously the westward expansion of agriculture. An outward shift of SS would also result in increased trade.

4. The econometric approach

The analysis here uses the cointegrated VAR model and the methodology described in Juselius (2006). To model the long-run relationships the following model is estimated:

$$\Delta X_t = \alpha\beta' X_{t-1} + \Gamma\Delta X_{t-1} + \mu + \Phi D_t + \alpha\beta_0' t + \varepsilon_t, \quad (1)$$

where $X_t = (M_t, Z_t, XUK_t, XUS_t)'$ and t is the trend.

This model assumes that the $p = 4$ variables in X_t are related through r equilibrium relationships with deviation from equilibrium $u_t = \beta' Z_t$, and α characterizes the equilibrium correction. It holds that α and β are $p \times r$ matrices and the rank of $\Pi = \alpha\beta'$ is $r \leq p$. The autoregressive parameter, Γ , models the short-run dynamics, and throughout it is assumed that $\varepsilon_t \sim iid.N_p(0, \Omega)$.

D_t is a vector of dummies, which is discussed in the next section.

5. Empirical analysis

The results presented here were obtained using CATS in RATS, version 2. The period used for estimation is 1838 to 1913, thus avoiding extreme periods such as the mid-1830s, when the UK was re-exporting wheat to the US, and the First World War. Besides, the grain invasion occurred after 1838 and was complete by the 1870s.

5.1 The variables

M is the logarithm to the total imports of wheat from the US to the UK in thousands of imperial quarters *per UK capita*.

$Z = \log(ave + ff)$, where *ave* is the *Ad Valorem* Equivalent of the UK tariffs and *ff* is the freight factor. Z is thus a measure of the gap between the price of British and American wheat.

XUK is the logarithm to the total output of wheat in the UK in 1000s of imperial quarters *per capita*.

XUS is the logarithm to the total output of wheat in the US in 1000s of imperial quarters *per UK capita*.

By expressing all relevant variables in *per capita* terms, it is possible to condition on the increasing population and thus demand for wheat in the UK.

5.2 Extreme observations and measurement errors

Special events and measurement errors might affect the interrelationships between imports, the price gap and wheat supply in the two markets:

Although 1838 can be considered to mark the decisive shift towards free trade in wheat (O'Rourke & Williamson 2005, Sharp 2006), with the duty on wheat equivalent to a 2 per cent *ad valorem* tariff, by 1842 it was at equivalent to a 15 per cent tariff and it remained high for most years until 1849 when the notorious Corn Laws 'sliding scales' were abolished. (Sharp 2006, p.7) The import trade was particularly hard hit in 1844.

Imports are also extremely low in 1859, but a comparison with the United States (1879)³⁵ reveals that it is probably a measurement error (although it is consistent with the numbers reported in British Parliamentary Papers). UK wheat production is affected by a number of harvest failures: in particular in 1880, 1895 and 1904.

By controlling for the above it is possible to uncover the underlying long-run model for 'normal' observations. Moreover, this is necessary if the assumption of the model, that the residuals are iid and normally distributed, is to be fulfilled.

Special events which have only transitory effects, from period T_0 to T_x are modelled by dummies of the form $Di_t = 1_{\{t=T_0\}} - 1_{\{t=T_x\}}$. A dummy of the form $Dp_t = 1_{\{t=T_0\}}$ allows for the special event to have permanent effects on the levels of the variables. Special events which involve level shifts in the cointegrating relations are modelled by dummy variables of the form $C_t = 1_{\{t \geq T_0\}}$.

An interesting conclusion to be drawn from an analysis of the residuals is that harvest failures in the UK have permanent level effects. Scholars have previously puzzled over why it took so long after the repeal of the protectionist Corn Laws in 1846 for agricultural supply in the UK to start falling; leading some to conclude that legislative protection had no impact on UK wheat supply (see for example Kemp 1962). It seems, however, that it took major harvest failures before farmers were forced off the land, or until they possibly diversified into non-wheat growing activities.

³⁵ This reports exports of wheat to Great Britain and Ireland of 1,322,718 bushels in 1859 as compared to 1,934,206 bushels in 1860. Compare to Mitchell and Deane's 160cwt. in 1859 and 6,497cwt. in 1860.

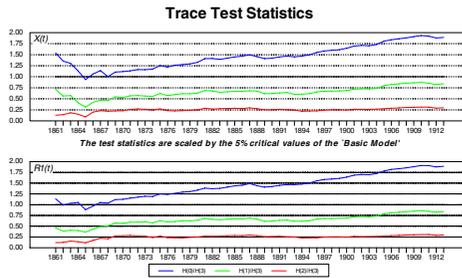
5.3 Specifying the model

All subsequent analysis relies on the choice of lag-length of 2 in the model in equation (1) being correct. Using information criteria, it is found that $k=2$ lags are in fact sufficient to characterize the systematic variation in the model. This assumption was verified at various points during the subsequent analysis.

After introducing the dummies, the model appears to fulfil the iid-normality assumption. The F-test for (no) autocorrelation up to second order is accepted with a p-value of 0.31. The Doornik & Hansen (1994) test for normality is accepted with a p-value of 0.55. The univariate tests for the individual variables are likewise accepted.

Before determining the cointegration rank, weak exogeneity of XUS_t was tested for. Weak exogeneity corresponds to a zero row in α , since this implies that this variable contains no information about the long-run parameters in β . This seems likely, since small-economy assumptions would mean that American wheat supply was not impacted on by British variables. The test is calculated for $r=1, \dots, p-1$ and is accepted with a p-value close to 0.30 in all cases. In the following, therefore, XUS_t is restricted to being weakly exogenous and the maximum rank of Π is correspondingly reduced by 1. US wheat supply was probably more a function of immigration and domestic price considerations.

A crucial step in the analysis is to determine the number of equilibrium relationships, r . The models are therefore estimated in the nested sequence $H(0) \subset \dots \subset H(r) \subset \dots \subset H(3)$, where $H(0)$ is the VAR in first differences and $H(3)$ is the unrestricted VAR in levels. Whilst the LR rank test for $r=2$ against $r=3$ (full rank) is rejected at the 5 per cent level with a p-value of 0.04,³⁶ recursive estimation of the trace test statistics shows that given more observations the test would be accepted.



5.4 The long-run relations

Proceeding with the assumption that $r=2$ and normalizing on UK output and imports gives the results reported under H_0 in table 1. In the adjustment matrix, α , imports and UK wheat output are clearly endogenous and it therefore makes sense to normalize on these variables.

In order to assess the significance of the β coefficients, it is necessary to impose identifying restrictions. This is done by restricting insignificant coefficients to zero. Table 1 reports the results of some of the models estimated, with H3 being the final model chosen.

³⁶ The asymptotic distributions of the tests depend on the deterministic variables and the presence of a weakly exogenous variable. The asymptotic p-values are therefore based on a simulated asymptotic distribution from CATS.

Table 1

	H0				H1				H2				H3			
	alpha(1)	alpha(2)	beta(1)	beta(2)	alpha(1)	alpha(2)	beta(1)	beta(2)	alpha(1)	alpha(2)	beta(1)	beta(2)	alpha(1)	alpha(2)	beta(1)	beta(2)
M	0.2104 [10.8]	-0.02 [-1.2]	-3.73	1	-0.18 [-0.5]	-0.86 [-6.1]	-0.26 [-10.1]	1	-0.28 [-0.7]	-0.90 [-5.4]	-0.31 [-12.9]	1	-0.29 [-0.7]	-0.89 [-6.0]	-0.27 [-11.6]	1
Z	0.02 [1.8]	-0.01 [-1.3]	-1.05	2.32	-0.24 [-1.1]	-0.15 [-2.0]	0.02 [0.2]	0.32 [1.8]	-0.26 [-1.2]	-0.17 [-1.89]	0	0.31 [2.4]	-0.24 [-1.1]	-0.15 [-1.9]	0	0.33 [2.55]
XUK	-0.01 [-2.1]	-0.04 [-6.8]	1	20.88	-0.78 [-6.9]	-0.20 [-5.0]	0.11 [0.34]	-0.81 [-6.9]	-0.25 [-5.3]	1	0	0	-0.81 [-6.9]	-0.21 [-5.1]	1	0
XUS	...	...	10.86	-8.07	...	...	0.53 [2.6]	-3.00 [-9.0]	...	...	0.69 [2.68]	-2.98 [-5.2]	...	...	0.59 [3.3]	-3.1 [-13.5]
C(1880)	...	...	-2.85	5.28	...	...	0	0.85 [3.7]	...	...	-0.04 [-0.4]	0.62 [3.1]	...	...	0	0.80 [4.3]
C(1904)	...	...	-3.42	-2.01	...	...	-0.37 [-3.1]	0.86 [3.5]	...	...	-0.41 [-2.8]	0.88 [2.7]	...	...	-0.37 [-3.2]	0.84 [4.0]
t	...	...	0.04	0.59	...	...	0.03 [6.01]	0	...	...	0.02 [4.5]	-0.00 [-0.2]	...	...	0.03 [6.6]	0

Asymptotic t-values are in parentheses.

Since all variables are in logarithms, the coefficients in the β matrix can be interpreted as elasticities. Additionally, the exogeneity of XUS_t implies that causality runs from this variable (Granger causality). The relation for XUK_t reveals that, in equilibrium, a 1 per cent increase in the US wheat supply implied a 0.6 per cent decrease in the UK wheat supply. The expansion in the US was thus directly responsible for the decline in the UK, as long suggested by economic historians. However, this relation also implies that a 1 per cent increase in imports from the US was associated with a 0.27 per cent increase in UK wheat supply. This is (statistically) a very significant result, but is difficult to interpret. A possible explanation could be that a common explanatory variable has been omitted, for example an increase in demand for both which is not controlled for by expressing the variables in *per capita* terms. The sign is the opposite of that suggested by Harley (1986).

The second relation can be interpreted as a long-run relationship for the level of imports from the US. A 1 per cent increase in the price gap corresponds to a 0.33 per cent decrease in the level of imports, and a 1 per cent increase in the US wheat supply caused a 3.1 per cent increase in the level of imports. It might be noted that the latter is a very robust result, supported both by the identified models in table 1, but also by alternative specifications of the model, including those with differently specified and additional variables (not presented here).

Finally, further tests were made to check the assumptions of the model such as parameter constancy (see Juselius, 2006). None gave reason to question the validity of the estimation results.

6. Conclusion

The result that the increase in UK imports was mainly driven by the increase in the American supply is in fact so robust that it seems legitimate to state it as the final stylized fact:

Stylized fact no. 5: The increase in British imports of wheat from the US after 1838 was mainly attributable to the increase in American supply.

Intriguingly, this implies that the grain invasion was, at least in part, *not* due to ‘globalization’, as defined by O’Rourke & Williamson (2002a, p.25), which for them is market integration, or a decline in the ‘wedge’ illustrated in figure 4. The ‘first era of globalization’ might therefore have more in common with the ‘overseas trade boom’ of 1500-1800 (O’Rourke & Williamson, 2002b), than has previously been suggested.

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A data appendix is available on request.

Ernesto ‘Che’ Guevara: a rebel against Soviet political economy

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In January 1962 Guevara told colleagues in Cuba’s Ministry of Industries (MININD): ‘In no way am I saying that financial autonomy of the enterprise with moral incentives, as it is established in the socialist countries, is a formula which will impede progress to socialism’. He was referring to the economic management system applied in the Soviet bloc, known in Cuba as the Auto-Financing System (AFS). By 1966, in his critique of the Soviet *Manual of Political Economy*, he concluded that the USSR: ‘is returning to capitalism’. This paper will demonstrate that Guevara’s analysis developed in the period between these two statements as a result of three lines of enquiry: the study of Marx’s analysis of the capitalist system, engagement in socialist political economy debates and recourse to the technological advances of capitalist corporations. At the same time Guevara was engaged in the practical experience of developing the Budgetary Finance System (BFS), an alternative apparatus for economic management in MININD.

Guevara was head of the Department of Industrialization and President of the National Bank in 1960 when all financial institutions and 84 per cent of industry in Cuba were nationalized. His BFS emerged as a practical solution to problems thrown up by the transition from private to state ownership of industrial production. Cuba had an unbalanced, trade-dependent economy dominated by foreign interests, principally from the United States. The production units which passed under the Department’s jurisdiction ranged from artisan workshops to sophisticated energy plants. Many faced bankruptcy while others were highly profitable. Guevara’s solution was twofold: first, to group entities of similar lines of production into centralized administrative bodies called Consolidated Enterprises. This allowed the Department to control the allocation of scarce administrative and technical personnel following the exodus of 65-75 per cent of managers, technicians and engineers after 1959; and second, to centralize the finances of all production units into one bank account for the payment of salaries, to control investment and sustain production in essential industries which lacked financial resources. With the establishment of MININD in February 1961, the BFS evolved into a comprehensive apparatus which embedded these organizational structures in a Marxist theoretical framework, to foster Cuba’s industrialization, increase productivity and institutionalize collective management.

Advanced technology

Guevara set up the BFS with *compañeros* who understood the internal accounting practices, administrative centralization and productive concentration of US corporations and their subsidiaries in Cuba. Guevara examined the documentation from these companies as they fell into state hands. He was impressed with their management structures, the use of centralized bank accounts and budgets, determinate levels of responsibility and decision-making, and departments for organization and inspection. He told colleagues that the BFS had an accounting system similar to the pre-1959 monopolies operating in Cuba, with their efficient control systems: ‘it’s not important who invented the system. The accounting system that they apply in the Soviet Union was also invented under capitalism’.

Guevara first travelled to the USSR in 1960. His deputy Orlando Borrego recalled that they visited an electronics factory which did accounts by abacus. Having studied the US-owned Cuban Electricity Company, Shell, Texaco and other corporations which used the latest IBM accounting machines, Guevara was struck by the backwardness of Soviet techniques. He believed that advances achieved by humanity should be adopted without fear of ideological contamination.

With the imposition of the US blockade, Cuba was forced to buy factories from the socialist countries, especially the USSR. This assistance was essential, but the relative backwardness of the

equipment clashed with Guevara's desire for advanced technology transfers. He did not criticize the Soviets for this backwardness per se. Rather, he complained about the contradiction between the high level of research and development in military technology and low investment applied to civilian production. He objected to their ideological resistance to appropriating advances made in the capitalist world. This was a costly mistake in terms of development and international competitiveness. For example: 'For a long time cybernetics was considered a reactionary science or pseudo-science ... [but] it is a branch of science that exists and should be used'. He added that in the US the application of cybernetics in industry had resulted in automation – an important productive development.

Basing a management system for socialist transition on capitalist technology was consistent with Marx's stages theory of history, which predicted that communism would emerge from the fully developed capitalist mode of production. Marx showed how the tendency to concentration of capital, that is, to monopoly, was inherent in the system. Therefore, the monopoly form of capitalism was more advanced than 'perfect competition'. The Soviet system originated from predominantly underdeveloped, pre-monopoly capitalism. A socialist economic management system emerging from monopoly capitalism could be more advanced, efficient and productive. The origin of the BFS was the multinational corporations of pre-1959 Cuba and it was therefore more progressive than the AFS which was adapted from pre-monopoly Russian capitalism.

Marx's analysis of the law of value

While Guevara argued for the adoption of advanced technology he opposed the use of capitalist mechanisms to determine production and consumption. He challenged the Soviet's reliance on capitalist categories to organize the socialist economy, particularly the operation of the law of value. The dispute about the law of value in transition economies is central to the question about the feasibility of constructing socialism in a country without a fully developed capitalist mode of production. It is integral to problems of accumulation, production, distribution and social relations. Communism implies a highly productive society in which conditions exist for distribution of the social product based on need, not surplus-generating labour time. However, the countries which have experimented with socialism have been underdeveloped, lacking the productive base for the material abundance implied by communism. The Soviet solution was to rely on the operation of the law of value to hasten the development of the productive forces, applying the profit motive, interest, credit, individual material incentives and elements of competition to promote efficiency and innovations. Guevara argued that these were not the only levers for fostering development. The BFS was the expression of his search for an apparatus to increase productive capacity and labour productivity without relying on capitalist mechanisms which undermine the formation of new consciousness and social relations integral to communism.

Between 1963 and 1965 these questions were examined in Cuba during the Great Debate on socialist transition. To the extent that commodity production and exchange through a market mechanism continued to exist after the Revolution in Cuba, it was clear to all participants in the Great Debate that the law of value continued to operate. The social product continued to be distributed on the basis of work done. However, the disagreements were about the conditions explaining the law's survival, its sphere of operation, the extent to which it regulated production, how it related to the 'plan' and whether the law of value should be utilized or undermined, and if so, how. This discussion was linked to practical questions such as how enterprises should be organized, how workers should be paid and whether goods should be exchanged between state enterprises as commodities.

Guevara agreed that the law of value remained under socialism but argued that measures taken by the Revolution to undermine the capitalist market meant that the law could not serve as the dynamic catalyst to productivity and efficiency in the same way as it did under capitalism. Socialization of the means of production and distribution had 'blunted' the tools of capitalism. Marx described a commodity as a good which changes ownership, from the producer to the consumer. Consistent with this definition, Guevara insisted that products transferred between state-owned

enterprises did not constitute commodities because when they were transferred from one state factory to another there was no change in ownership. The state itself should be considered as one big enterprise. For Guevara commodity-exchange relations between factories threatened transition, via ‘market socialism’, to capitalism. He stressed central planning and state regulation as substitutes to such mechanisms.

The Soviets argued that commodity production, the law of value, and money would disappear only when communism was achieved, but that to reach that stage it was necessary to use and develop the law of value as well as monetary and mercantile relationships. Guevara disagreed:

‘Why develop? We understand that the capitalist categories are retained for a time and that the length of this period cannot be predetermined, but the characteristics of the period of transition are those of a society that is throwing off its old bonds in order to move quickly into the new stage. The tendency should be, in our opinion, to eliminate as fast as possible the old categories, including the market, money, and, therefore, material interest – or, better, to eliminate the conditions for their existence.’

For Guevara the task was not to use the law of value nor even hold it in check, but to define its sphere of operation and make inroads to undermine it – to work towards its abolition, not limitation. He developed many policies within the BFS to attempt just that. In February 1964, Guevara concluded: ‘We deny the possibility of consciously using the law of value, basing our argument on the absence of a free market that automatically expresses the contradiction between producers and consumers ... The law of value and planning are two terms linked by a contradiction and its resolution’. For Guevara, centralized planning was the fundamental characteristic of socialist society. He conceded only: ‘the possibility of using elements of this law [of value] for comparative purposes (cost, ‘profit’ expressed in monetary terms)’.

The protagonists in Cuba were well-informed about the broader debate on incentives and financial autonomy contemporaneously underway in the eastern European socialist countries – a response to the problems of economic stagnation, low productivity and efficiency, particularly in comparison with economic growth in the developed capitalist world. In July 1964 Guevara told colleagues that he had been reading analyses from the socialist bloc, including the resolutions of the 14th Congress of the Polish Communist Party: ‘The solution that they are proposing for these problems in Poland is the complete freedom of the law of value; that is to say, a return to capitalism’. Commenting on the push to ‘liberalize’ the socialist economies Guevara said: ‘The theory is failing because they have forgotten Marx’. Instead of *Capital*, the Soviet *Manual of Political Economy* had been turned into a bible.

Marx characterized the psychological or philosophical manifestation of capitalist social-relations as alienation and antagonism; the result of the commodification of labour and the operation of the law of value. For Guevara, the challenge was to replace the individuals’ alienation from the productive process, and the antagonism generated by class relations, with integration and solidarity, developing a collective attitude to production and the concept of work as a social duty. Capitalist competition created the drive to increase productivity through technological innovations and increasing exploitation. Alienation and antagonism increase with productivity. Under socialism, the development of the productive forces could be less accelerated, but it should be accompanied by a growth of consciousness. For Guevara, efforts to change consciousness must be incorporated into socialist transition at the earliest stage.

Critique on the Soviet *Manual of Political Economy*

In April 1965, Guevara left Cuba to lead a Cuban military mission in the Congo. The guerrillas were defeated and Guevara stayed in Tanzania and the Czech Republic between 1965 and 1966 where he began work on a comprehensive analysis of the political economy of socialist transition. In preparation for this work, Guevara took notes on the Soviet *Manual*, applying his theoretical arguments expounded in the Great Debate to that text. The notes were not written for publication, nor

brought together as text. They were comments responding to specific paragraphs of the *Manual*; notes to himself, including indications of areas for further study.

Guevara criticized the *Manual's* mechanistic adaptation of classical Marxist conceptions of class relations between the bourgeoisie and the working class, without considering the effects of imperialism which created a privileged working class in the advanced capitalist countries as well as beneficiary sectors in the exploited nations. He denounced as opportunism the *Manual's* attempts to air-brush the inherent violence of class struggle integral to the transition from capitalism to socialism.

Turning to the period of transition, Guevara argued that the USSR's Kolkhoz collective farm system was not a characteristic of socialism and that cooperatives were not a socialist form of ownership – they generated a capitalistic superstructure which clashed with state ownership and socialist social relations imposing their own logic over society. Guevara systematically refuted the so-called laws of socialism cited by the *Manual*, particularly the law of constant rising worker productivity – which he called an outrage: 'It is the tendency that has driven capitalism for centuries'. He condemned as 'dangerous' the Soviet's policy of peaceful co-existence and economic emulation with the advanced capitalist countries and pointed to serious disagreements between the socialist countries, blaming them on unequal exchange and the imposition of capitalist categories in trade relations.

While declaring his daring, respect, admiration and revolutionary motives, Guevara announced that Lenin was the ultimate culprit because the New Economic Policy (NEP) which he had been forced to introduce in 1921 imposed a capitalist superstructure on the USSR. The NEP was not installed against small commodity production, Guevara stated, but at the demand of it. Small commodity production holds the seeds of capitalist development. He was certain that Lenin would have reversed the NEP had he lived longer. However, Lenin's followers: 'did not see the danger and it remained as the great Trojan horse of socialism, direct material interest as an economic lever' This capitalist superstructure became entrenched, influencing the relations of production and creating a hybrid system of socialism with capitalist elements that inevitably provoked conflicts and contradictions which were increasingly resolved in favour of the superstructure – capitalism was returning to the Soviet bloc.

Guevara's notes offer a profound criticism of Soviet political economy. He himself warned that some would misinterpret his proposed work as rabid anti-communism disguised as theoretical argument, but asserted that the inability of bourgeois economics to criticize itself, pointed out by Marx at the beginning of *Capital*, was seen in contemporary Marxism. He dedicated his work to Cuban students who go through the painful process of learning 'eternal truths' in eastern European manuals. He concluded that: 'Humanity faces many shocks before final liberation, but we cannot arrive there without a radical change in the strategy of the first most important socialist powers'.

Conclusion

This paper has summarized the analysis which led Guevara to forewarn the collapse of socialism in the socialist bloc. He made an important contribution to both the theory and practice of constructing socialism. He hoped to persuade socialist countries to gradually replace capitalist mechanisms during transition and offered alternative policies to serve this function. His warnings were not heeded and, for the reasons which Guevara predicted, among others, capitalism returned to all those countries. In Cuba, his analysis was revisited in the mid-1980s in the period known as Rectification which pulled the island away from the Soviet model before it collapsed, arguably contributing to the survival of Cuban socialism.

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The Conservative approach to religious sectarianism in Liverpool and Belfast, 1880-1921

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This paper discusses the Conservative approach to religious sectarianism in Liverpool and Belfast against the backdrop of changes in British national identity, community and religion during 1880-1921. The cities provide two paradigms analysing the response of particular political movements to popular contention and collective violence within a context of expanding democratization. Liverpool's experience of 'endemic' sectarian disorder teaches us that violence, a contingent mode of collective action employed by modern social movements as part of their repertoire of contention, can be triggered and ultimately reshaped by democratization. In multi-ethnic environments this process with its potential conflation of the ethnos and demos may lead to ethnic conflict. Democratization not only reveals opportunities for collective action but also, if resulting in only partial access, highlights the inadequacies of established avenues of power and leadership and the constraints and limitations of formal politics and organization. A growing disjuncture between expectation and delivery may occur resulting in the attenuation of traditional relations between the so-called 'swells' and the 'masses', precipitating a sustained and multi-layered protest cycle. A contingent outcome may be the fragmentation and devolution of power and erosion of mechanisms of restraint and control resulting in a divergence between formal politics and organization and the frequently belligerent politics of the street. Frustrated and marginalized constituencies may look to alternative grassroots leaders and modes of collective action in order to articulate their interests. Sustained contention leads to the formation of durable social movements employing violence, alongside other action, as a highly effective means of escalating social protest. Employed by ethno-nationalist movements collective violence can constitute a form of cultural defence, preserving marginal privilege or perceived ascendancy against an internal and/or external 'Other', or as protection against cultural transition, forcefully reminding traditional leaders of their historic obligations.¹

On the other hand, Belfast's experience of popular sectarianism tells us that endemic violence can be effectively contained and controlled, again highlighting profound transformations within existing power relations. The case of Ulster Unionism proves it is possible for a political movement operating in a multi-ethnic society to fundamentally re-evaluate its relationship to collective violence and to the forces perpetrating it. Such a re-evaluation may occur in the light of overarching political circumstances and imperatives including the necessity for coalition-formation with those of differing outlooks and the need to engage with national political culture and identity. By intervening in the name of a common cause or internal and/or external threat it is possible for a political movement to integrate or co-opt the principal agencies and personalities of a constituency perpetrating violence. By incorporating this constituency into a national political strategy, underpinned by seemingly democratic organizations and structures, it is possible to draw agitation away from collective action in the street into avenues of managed expression and resolution. Through the institutionalization of forms of protected consultation it is possible for a political movement to channel and reshape popular contention. Via reform and facilitative strategies the movement can mobilize popular sentiment, as part of the democratic process, in the pursuit of political aims and constructing political hegemony whilst simultaneously circumscribing the role and prominence of popular forces and 'policing' their excesses. Integral to this process is a political movement's clear differentiation between legitimate and 'illegitimate private' violence.² The ability of such political movements to contain and control

¹ Steve Bruce, *Choice and Religion. A Critique of Rational Choice Theory*, Oxford, Oxford Univ. Press, 1999, pp.24-6.

² H.G. Haupt, 'History of Violence', in Neil. J. Smelser & Paul.B.Baltes, eds, *International Encyclopedia of the Social and Behavioural Sciences*, Amsterdam, Paris, New York, Oxford, Shannon, Singapore, Tokyo, Elsevier, 2001, 16197.

popular violence is largely dependent upon the currency and immediacy of the initial unifying cause or threat. To a large extent, this factor determines the perceived legitimacy and authority of the leadership of the movement and the maintenance of popular enthusiasm underpinning political and organizational initiatives. The contingent outcome of a power vacuum may be a generalized protest cycle accompanied by an erosion of established mechanisms of restraint and control, with underlying grievances and aspirations finding expression through radical social movements, employing alternative forms of collective action including street violence. Confronted by this challenge, political elites can facilitate further political and organizational reform and integration, implement repression or adopt a pragmatic approach. The latter may result in the development of an expedient co-existence and interaction between formal political action and organization and legitimate and illegitimate modes of popular collective action.

Consequently, in order to comprehend the complex interaction between political movements and popular violence it is necessary to understand the location and distribution of power and leadership within these relationships. Religious sectarianism, the principal dynamic behind collective violence in Liverpool and Belfast, was a complex force operating in the social, economic, political and ideological spheres. Crucially, it constituted both a fundamental, and contingent, component of evolving, unifying, competing and conflicting local, communal, regional and national identities. Sectarianism was a perennial blight upon inter-communal relations (Protestant-Catholic) whilst acting as both a galvanizing source of collective action and a highly divisive force within the dominant Protestant communities. Both cities displayed similar characteristics in terms of their experiences of sectarianism but differed dramatically in the manifestation of their 'communal strife' during 1880-1921. I have identified the following factors explaining the prevalence and effectiveness of sectarian violence in Liverpool and the capacity of Ulster Unionism to contain and control sectarianism's worst excesses in Belfast. These factors helped to determine the manifestation that sectarian conflict took in the two cities.

(1) Fundamental in determining the attitude and approach of Liverpool Tory-Democracy and Ulster Unionism to popular sectarianism and in ultimately sustaining or reducing violence was the intrinsic character of the two political movements. Throughout much of the period Liverpool remained a relative exception in terms of national political culture and identity. Due to this exceptionalism, Tory Democracy experienced little or no internal or external pressure to fundamentally re-evaluate its relationship to popular sectarianism. It was largely untroubled by concerns over its national image or local political repercussions arising from its association with sectarian violence. In contrast, from 1886 Belfast's Episcopalian-Conservative establishment was forced to re-evaluate its relationship to popular sectarianism in light of the critical battle of politics and propaganda in relation to Home Rule. Conscious of the need to respond to developments in British political culture and identity, this establishment constructed a national movement predicated upon principles of unity and respectability. It clearly differentiated between legitimate and 'illegitimate' violence, subordinated the role of explicit sectarianism and reined in the worst excesses of its sectarian support.

(2) During the period Liverpool experienced a sustained multi-layered protest cycle witnessing a profound fragmentation and devolution of social and political power, a rupturing in relations between the Tory-Anglican establishment and the Protestant working class. This cycle arose out of the political opportunities and constraints exposed by democratization, and the local stresses and strains induced by a complex and uneven national modernization process. An important facet of this process was the contradictory secularization dynamic, generating both local and national religious decline and renewal and in Liverpool religious and ethnic conflict. With Protestantism central to local ethnic and national identity, fragmentation within the Protestant community revolved around competing conceptions of British identity. Tory Democracy, a modern constructed political

nationalism with an ultimately contingent proto-nationalist core,³ and the Protestant Democracy, a radical hybrid of local religious, ethnic and class compounds, an ethno-nationalist movement with an intractable anti-Catholic core. This protest cycle was accompanied by erosion of residual restraint and control over the forces of popular sectarianism. Leadership over the Protestant working class devolved to militant grassroots organizations and personalities, a complex social movement mobilizing at street level to pursue Protestant interests. The Conservatives adopted a pragmatic attitude to Protestant violence unable to either facilitate reform and integration, or exercise restraint over the Protestant working class.

In contrast, Belfast's Episcopalian-Conservative establishment exerted increasingly centralized control over Ulster's anti-Home Rule forces in order to preserve the fragile unity and respectability of the emerging Ulster Unionist movement. Ulster Unionism was a constructed or invented nationalism, an imagined inclusive Protestant identity or religious ethnicity,⁴ engineered by local elites with an explicit national political agenda. Although modern and constructed, Ulster Unionism was framed by a central but contingent proto-nationalist core and juxtaposed in relation to the Irish Nationalist 'Other'. Appealing to local and national Protestant defence, the movement was instrumentalized in relation to developments in British political culture and identity. The Episcopalian-Conservative establishment intervened under the umbrella of Unionism in order to draw the principal Protestant local proletarian idiom and agency of sectarian violence, the Orange Order, into an overarching strategy. This centralized strategy of resistance enabled Ulster Unionism to exercise effective restraint and control over its sectarian support.

(3) The principal arena of sectarian conflict in the two cities was profoundly different reflecting the contrasting location of power and control over popular sectarianism. In Liverpool, the community of the street remained the primary arena of sectarian conflict. However, the street was not simply the principal location of conflict but constituted the main context for engaging with, establishing leadership over and mobilizing the Protestant working class. It became the domain of the 'Protestant Democracy', a powerful sectarian grassroots movement, employing violent forms of collective action as a means of social and political influence. The Protestant Democracy was an overwhelmingly locality based expressive or symbolic community,⁵ characterized by exclusionary bonded social capital,⁶ its identity constructed out of local environmental structural and cultural resources.

In stark contrast, from 1886 the emerging Ulster Unionist movement identified politics and propaganda as the primary means of combating the perceived threat posed to the Ulster Protestant community by Home Rule, or 'Rome Rule'. Ulster Unionism was an expressive or symbolic community, diffused beyond the local or regional, incorporating both bonded and bridging social capital.⁷ It was culturally constructed out of both local environmental factors and instrumentalized in relation to developments in national political culture and identity. Within this context the movement saw Belfast's 'endemic' sectarian rioting as a serious political liability both in terms of coalition-building within Ulster's fractious Protestant community and in converting British public opinion by avoiding perceptions of 'Ulster bigotry'.

(4) The character of Protestant associational culture in the two cities was pivotal in the contrasting success of Liverpool Tory-Democracy and Ulster Unionism in harnessing popular sectarianism and

³ See Oliver Zimmer, *Nationalism in Europe, 1890-1940*, Basingstoke, New York, Palgrave, MacMillan, 2003, pp.19-20, 22, 24.

⁴ Kevin J. Christiano, William H. Swatos Jr & Peter Kivisto, *Sociology of Religion. Contemporary Developments*, Walnut Creek, Lanham, New York, Oxford, Altamira Press, 2002, pp59-60.

⁵ N.W.Townsend & K.V.Hansen, 'Community, Expression of', in: *International Encyclopedia of the Social and Behavioural Sciences*, Vol.4, 2356-7.

⁶ Robert.D.Putnam, *Bowling Alone. The Collapse and Revival of American Community*, New York, London, Toronto, Sydney, Singapore, Touchstone, Simon & Schuster, 2001, pp.22-3.

⁷ Putnam, *Bowling Alone*, pp.22-3.

controlling its violence. Liverpool's diverse yet inter-connected Protestant culture reflected the fragmented and devolved nature of power within the Protestant community. It proved virtually impossible to effectively contain or control on a coherent basis becoming the organizational foundation and mobilizational mechanism of the 'Protestant Democracy'.

Whereas Liverpool's Protestant culture was primarily an agency of grassroots leverage, its Belfast counterpart was principally a vehicle of increasingly centralized Ulster Unionist control. Through its integration of the principal bridge to the Protestant working class, the Orange Order, Unionist culture largely succeeded in drawing Protestant agitation away from the street. It helped Ulster Unionism minimize national perceptions of explicit sectarianism by circumscribing the role and influence of the Order within the coalition and emasculated potentially divisive sources of alternative power and leadership within the Protestant community. Crucially, in terms of collective violence, it succeeded in mobilizing the strategic Protestant working class, channelling its energies into 'constructive' action whilst simultaneously 'policing' this constituency.

Consequently, Liverpool and Belfast provide two excellent paradigms for exploring the relationship between political movements and popular collective violence through an understanding of the location and distribution of power and leadership within such relationships. Liverpool Tory Democracy was a political movement that lost control over popular sectarianism, a dynamic social force responsible for large-scale violence in the city. With this loss of control there developed a pragmatic relationship between formal Conservative politics and organization and the belligerent politics of the street practised by the 'Protestant Democracy'. In contrast, Ulster Unionism was a political movement that succeeded in effectively containing and controlling popular sectarianism. Through its initiatives it drew Protestant agitation away from the street into disciplined structures and organizations as part of a centralized political strategy. In the process it succeeded in minimizing the potential for serious sectarian violence in Belfast. No doubt this greatly contributed to Ulster Unionism's ultimate success in the critical battle of politics in relation to Home Rule.

To sum up, Liverpool's experience during 1880-1921 illustrates that sectarian violence, the contingent outcome of a protest cycle triggered by the opportunities and constraints revealed by democratization in a multi-ethnic environment, continued to co-exist and interact with an expanding political system. In contrast, Belfast reinforces the argument that collective violence, even within multi-ethnic environments, can be channelled and reshaped with the advance of modern democratic political systems.

However, the picture is not so straightforward when we look at the transformations that occurred in the prevalence and attitude towards sectarian violence in the two cities towards the end of the period. From 1911 onwards, Liverpool experienced a dramatic decline in large-scale sectarian violence coinciding with the erosion of the city's relative exceptionalism in terms of national political culture and identity. This transition compelled the local Conservative establishment to re-evaluate its relationship to popular sectarianism in light of the following key local and national developments.

(1) During and after the 1911 Transport Strike there was concerted external intervention in Liverpool's affairs caused by the fear of 'social revolution' embodied by the strike and the perceived role of street mobilization in the disturbances.

(2) The insidious impact of secularization as part of the uneven modernization process. In the short term this contributed to local ecclesiastical institutional decline, religious renewal and conflict. However, after the First World War Liverpool witnessed a diminution in the significance of sectarianism within its local political culture and communal interaction.

(3) The extension of the franchise in 1918 progressively channelled militant Protestant energies away from the street into political agitation. Although Liverpool's political culture remained highly distinctive, the rise of the Labour Party signified the encroachment of a more representative national politics predicated upon socio-economic class. This was facilitated by:

(a) the resolution of the divisive Irish Question in 1921; (b) the undermining of the local cultural and community infrastructure of sectarianism by mass interwar slum clearance.

In contrast with the passage of the Fourth Home Rule Bill in 1920 and the creation of Northern Ireland, Belfast became increasingly marginal to British political culture and identity resuming its status as the capital of a largely parochial sectarian local state. In light of these new political realities Ulster Unionism re-evaluated its relationship to popular sectarianism adopting a more pragmatic approach to Protestant violence no longer overly preoccupied with national perceptions or political considerations.

These dramatic transformations highlight the complex and contingent relationship between democratization and collective violence. Another highly important factor in determining the 'prevalence' of violence is the fundamental character of the political movement in question. In other words, the degree to which a movement is motivated and influenced by primarily local considerations, or national political culture and identity. Despite the erosion of parochialism as part of the uneven modernization process, Belfast and Liverpool illustrate the complex interplay between the locality and the nationalization of British political culture and identity. They highlight the contingent impact of national modernization processes upon distinctive local cultures and communal identities. They could reshape and reorient these communities in the national image and/or provoke fragmentation and conflict. The British working class continued to be shaped by local factors such as a dominant religious, ethnic or class culture and identity. These symbolic communities could circumscribe wider class allegiance and reinforce or conflict with local or national conceptions of the nation. Within a multi-ethnic environment, religious, ethnic, class and national compounds could coalesce during a protest cycle, generating ethno-nationalist movements employing violence as both social protest and cultural defence. Therefore, a key determinant in sustaining collective violence can be the degree to which a political movement is intrinsically parochial in character and outlook or largely dependent for its survival and success upon engagement with national political culture and identity.

ABSTRACTS OF ACADEMIC PAPERS

I/A Origins of the Welfare State

Chair: **Richard Smith** (Cambridge)

Commentators: **Bernard Harris** (Southampton) & **Christoph Sachsse** (Kassel)

Peter Hennock (Liverpool)

The origins of the Welfare State in England and Germany, 1850-1914: social policies compared

This is a comparative study of social policies associated with the origin of the welfare state. Its four parts deal with the poor law, industrial injury, sickness, invalidity and old age, and with unemployment. In view of the fundamental changes wrought by the War it ends in 1914 but looks ahead to the introduction of British insurance pensions in 1925.

The treatment of comparative history is historiographical: two different national historiographies confronting and complementing each other. That has led to the inclusion of the poor law in the study of German social policy, something never done systematically before. The result is not only the fullest presentation of the German poor law in English, but a re-interpretation of the significance of the insurance legislation of the Bismarck era. This draws attention to the dynamism of German social insurance once it was no longer regarded as an aspect of poor law policy, as it had been before. In contrast British social policy has remained an aspect of poor relief, although for deserving groups for whom the deterrent approach of the poor law authorities was considered inappropriate. In consequence it relied on low uniform contributions and below subsistence benefits, in practice even after 1946. German social insurance was characterized by differentiation of contributions and benefits according to wage levels, which was accentuated with almost every legislative amendment. Furthermore it came to provide long-term medical care, rehabilitation of the injured and medical treatment for dependants. It was developed to meet the aspirations of ever more elements of the population. In the period covered here this culminates in the special insurance for white-collar workers of 1911 but ultimately in the pension law of 1957.

The German priorities that replaced poor law considerations in the 1880s are examined in the light of the latest research. This overturns accepted views of Bismarck's own priorities but also emphasizes the increasing frequency with which legislation on social policy was pushed beyond government intentions by forces in the *Reichstag* and outside.

That national insurance plays a significantly smaller role in Britain than in Germany is well known to students of contemporary welfare states. This book demonstrates that this difference goes right back to the founding years. Decisions taken in that period are crucial to the long-term difference between the two countries.

I shall make two points about this difference:

1. The first develops the contrast between flat-rate contributions linked to minimal benefits and differentiated contributions linked to benefits according to income levels, which was mentioned just now. Why did British national insurance retain this emphasis that had been abandoned in Germany? I suggest that this reflects a difference of attitude to compulsory savings. Minimum savings might have to be imposed on all for the sake of the feckless, but compulsion remained decidedly a second best in Britain. Beyond an essential minimum, people were expected to be able to make provision according to their particular circumstances. Since the 1870s German policy-makers had accepted that workers in general could not be relied upon to make the savings necessary for their future. There was no parallel to this in Britain in this decisive era, and only for the briefest period since. This in turn has left the field open for compulsory insurance to be imposed by employers as a condition of employment. Such occupational pensions grew enormously after 1925. The conversion of the Labour party to state earnings-related pensions (SERPS) in the 1950s and their subsequent failure to oust the Conservative government merely accelerated that process. By 1975, when a Labour government introduced its state earnings related pension scheme, it was too late to reverse the growth of occupational pensions that locked workers into dependence on their employers. In 1984 compulsory insurance above the minimum was therefore abandoned in the interest of labour

mobility, leaving workers free to make their own provision with the help of a state subsidy and employers free to decide whether to offer occupational pensions and largely on what terms. Even now government policy cannot contemplate effectively compelling the whole population to save for an adequate income on retirement.

2. Even for purposes for which compulsion was accepted the reliance on national insurance has been less in Britain than in Germany. There has been a greater commitment to general taxation instead. The reforms of the 1940s, which extended national insurance to the whole employed population, also withdrew medical treatment from its scope. We find nothing like the close identification of the welfare state with social insurance that has existed in Germany and has led German historians to regard the social insurance legislation of the 1880s as marking the beginning of their welfare state. The German development was originally due to the Empire's limited powers of taxation but continued long after the Empire's demise.

Traditionally the British poor law was financed from the rates. Public health was also financed from the rates but increasingly topped up from general taxation. In 1911 those matters of social security no longer considered suitable for the poor law began to be financed through social insurance, but public health continued to depend on general taxation. There is no such distinction in Germany, where social insurance has always been used to finance the personal health services.

British policy recognizes that insurance premiums imposed only on the employed population are inappropriate for services that are nation-wide. The British reliance on general taxation for the health services is fine when increases in general taxation are politically acceptable. When they are not, automatic increases in insurance contributions as earnings rise has proved the more reliable form of support.

There has thus been a fundamentally different attitude to social insurance in the two countries. Sometimes this has been due to British distrust of state compulsion and its restrictive consequences: sometimes to British preference for taxation and its greater inclusiveness. The outcome is clear: in matters of social insurance British policy has been restrictive and German policy expansive. That pattern was established by 1925 and is still with us today.

I/B Early Modern Textiles

Chair: **Pat Hudson** (Cardiff)

Jane Whittle (Exeter)

Purchasing textiles and constructing clothing in early seventeenth-century England: a consumers' viewpoint

The textile and clothing trades of early modern England have rarely been considered from a consumer's viewpoint, and what has been written focuses largely on the late seventeenth and eighteenth centuries.¹ This paper looks at the early seventeenth century, using twenty years of household accounts kept by Lady Alice Le Strange of Hunstanton, Norfolk, for her family and household, to analyse patterns of purchase. It examines the types and cost of cloth and other clothing-related items purchased, the range of workers employed to make items of dress and their relationship to the household, and the use of the different items purchased. A micro-study of one household provides unprecedented detail about how, from a consumer's viewpoint, a full set of clothing was constructed in this period.

Expenditure and Prices

Expenditure by the Le Strange household on textiles and other items of dress such as shoes ranged from as high as 21 per cent to as low as 6 per cent of their annual expenditure in the period 1606-26. In fact, the amount spent on these items remained quite stable over time while the household's total expenditure increased considerably, in line with their income which increased from £500 a year in 1610, to over £2,000 in the early 1620s. These findings are in line with Gregory King's estimate that on a national level around a quarter of all personal expenditure was spent on apparel in 1688; and Weatherill's analysis of five late seventeenth and early eighteenth century household accounts which found that clothing made up between 16 per cent and 6 per cent of expenditure, second only to food in importance.²

During the period 1606-26 the Le Stranges purchased at least 50 different types of fabric, as well as a wide range of other clothing-related items such as thread, buttons, lace, ribbon, shoes, boots, hats and gloves. The paper will give details on price per yard of fabric and per item for other purchases. As the accounts usually record which member of the household items were purchased for, it is possible to reconstruct the expenditure on dress, and range of items purchased, for particular individuals. A comparison is made between the head of household, Sir Hamon Le Strange, his eldest son Nicholas (b.1604), and daughter Elizabeth (b.1613).

Purchases, employment and social networks

Constructing clothing involved not only purchasing ready made items but also employing a range of workers to produce bespoke items. To take one year as an example, during 1612 the Le Stranges made payments to seven different tailors, two shoemakers, a weaver, a dyer, a stocking knitter, and someone to mend gloves. The tailors ranged from Sappe and Lock, located in Norwich, to Powll and Davidson, local men who did less sophisticated work on a regular basis, and Widow Sibborne, who was employed once to make 'a pair of sheets and a pair of pillowbears'. Hats and gloves were purchased ready-made, but this was never the case for hose and shoes. While the Le Stranges bought

¹ See in particular the special edition of *Textile History*, 22:2 (1991) edited by N.B. Harte on 'Fabrics and Fashions: Studies in the Economic and Social History of Dress'; John Styles on 'Involuntary consumers? Servants and their clothes in early modern England', *Textile History* 33:1 (2002) pp.9-21 and *ibid.* 'Clothing the north of England, 1660-1800', *Textile History* 25 (1994) pp.139-66; Beverly Lemire, *Fashion's Favorite* (1991), and *Dress, Culture and Commerce* (1997); Margaret Spufford, *The Great Reclothing of Rural England* (1984).

² N.B. Harte, 'The economics of clothing in the late seventeenth century', *Textile History* 22:2 (1991) pp.290-1 and Lorna Weatherill, 'Consumer behaviour, textiles and dress in the late seventeenth and early eighteenth centuries', *Textile History* 22:2 (1991) p.299.

their groceries in King's Lynn, the nearest town, and acquired luxury items in London (including Hamon Le Strange's hats), they often used tailors and shoemakers from Norwich on the opposite side of Norfolk. Some craftsmen were only used once or twice, but a number had a longstanding relationship with the household. Mr Lock, a tailor, who worked for them between 1606 and 1619, was also employed by other members of the wider family, and seems to have had a sideline in informal banking. He lent sums of money (separate from the tab owing for work), and also took money to be invested in the 'East India adventure'. Other workers were more local and less wealthy. 'Wix's wife' knitted hose. Her husband was the local thatcher who was frequently employed by the Le Stranges, while 'Wix's boy' did general agricultural and labouring work for the household. Powll the tailor came from a tenant family in neighbouring Ringstead; he or another member of that family also did casual labouring for the Le Stranges. Many of these families may also have provided servants for the Le Strange household. Among the Le Strange servants in this period were Alice Powll, employed in 1622, Margery Sibborne from 1615-21, and Anne Whittle, perhaps the daughter of Whittle the weaver, from 1618-22.

Examining the textile and clothing trades from the point of view of the consumer in this microstudy of one gentry household provides data on expenditure and prices, and draws our attention to the range of items available, the mechanisms of acquisition, and the rich web of social relationship between elite consumers such as the Le Stranges and those who produced and mended their possessions. On the other hand, some mysteries remain, such as how exactly the Le Stranges made the complex choices of types of fabric and styles of dress, from the rural backwater of Hunstanton, with only occasional trips to Norwich or London.

Giorgio Riello (Warwick)

The extension of the market for cotton textiles in early modern Eurasia

From the second half of the seventeenth century, cotton textiles – in particular those imported from India – participated in the shaping of new consumers' choices and the construction of new concepts of desirability in Europe. Printed and painted cotton goods, such as calicoes and chintzes, occupy a familiar place in the construction of what is commonly defined as a 'consumer revolution'. Issues of novelty, taste and imitation have been thoroughly examined in recent years by a booming historical literature surveying the place of consumers within the early modern British and European economies.

Eastern products and produce ranging from Chinese lacquer and porcelain to tea and textiles had high cultural and social significance in framing new practices and attitudes in Europe. Quantitative historians, however, are highly sceptical about the economic relevance of the commercial relationship between Europe and Asia before 1800. Recent estimates by Jan de Vries, for instance, show how in the four centuries between the opening of the Cape of Good Hope route and the French Revolution, just over 10 thousand voyages connected Europe and Asia: on average two ships a month. Whilst not denying the non-economic relevance of Eurasian trade, economic historians are disputing the scale and ultimate effect of such a trade on the economic development of the European continent.

This paper seeks to contextualize the trade of textiles between Europe and Asia by analysing its quantitative, as well as the qualitative impact on the European economy. The records of the English, Dutch, French, Portuguese and Swedish East India companies provide precious information about the import of Asian textiles into Europe. The English and the Dutch followed in the seventeenth and eighteenth centuries a path already well trodden by the Portuguese chartered company, the *Careira da India*. Cotton textiles were imported into Europe by sea from the late sixteenth century and by the mid seventeenth century they had grown to be one of the major commodities traded between India and Northern Europe.

This paper argues that Europeans appreciated the commercial, but also aesthetic and cultural potential of cotton textiles. It does so by looking at the extensive and complex network of traders exchanging cotton goods over enormous distances from the horn of Africa to Japan. The commerce of cotton textiles in Asia can be seen as a preliminary – and largely necessary condition – for Europe

to fully engage with a fibre previously little known. Central to these conditions are the accumulation of experience in trading and in gathering information.

It is important to notice that the first European engagement with cotton textiles was not in the export back to Europe but in the intra-Asia trade (also called ‘country trade’) mostly within the sphere of the Indian Ocean. Until well into the seventeenth century, spices from Southeast Asia, rather than cotton textiles from India, were considered to be the most desirable commodity for European markets. A problem soon emerged on what to barter in exchange for such commodities, as for centuries spice merchants in Malacca or Java had been used to exchanging their produce for cotton textiles traded by Gujarati and other merchants. As John Guy puts it, cotton textiles simply were: ‘lubricating the wheels of the Southeast Asia spice trade’.

The heavy engagement in the cotton textile trade was not the result of a European willingness to seize opportunities for economic development. The link between trade in textiles and the subsequent industrialization of parts of Europe through the cotton industry is a topic that is not considered in this paper. It suffices to underline how the links of causality between the two phenomena do not support the existence of an overarching vision of economic development. Initially European traders encountered several barriers in trading in textiles. They were more than welcome as buyers of spices and textiles for Europe, but they faced the resistance of Indian and other merchants when they claimed their share of the intra-Asian routes.

The disadvantage of European traders was not just the result of high competition. As Miles Ogborn has shown, the European companies faced a much more basic problem: the fact that they knew very little about Asia. Letters of introduction from European rulers and gifts could ease the first contact with potential commercial partners, but this was just the first step of a long learning curve for European traders. The need for constant information – as can be seen in the copious correspondence and memoranda sent by captains to their headquarters in London, Amsterdam and Lorient – was not just a bureaucratic process aimed at monitoring business carried out thousands of miles away. It constituted a necessary exercise for European traders in the Indian Ocean as a means of constructing a body of useful knowledge and practices.

Trade had to be routinized, and based on a solid information system that secured increasing efficiency. Information was also necessary to govern the complex relationship between the production and purchase of textiles in India and their sale and knowledge of consumer markets in Europe. This was fundamental for the subsequent development of cotton textiles as an industry in Europe. The paper considers three major areas in which trade helped the following engagement in the manufacturing of cotton textiles in Europe:

Products and merchandising: in the seventeenth century there were more than 150 different types of cotton cloths traded in the Indian Ocean. This was a complex market. The English East India Company initially traded in 50 types of cloth and the Dutch East India Company (VOC) in even more. Over the eighteenth century, however, both companies were able to identify the key types and concentrate their effort on specific markets thus simplifying their relationship with producers and middlemen in India and with retailers and consumers in Europe.

Productive specialization: European traders also learned about specialization of production within Asia. If woollens and linens were in many parts of Europe, cotton textiles were produced specifically in Gujarat, Coromandel and Bengal. The shift of supply from Gujarat to Coromandel and Bengal at the beginning of the eighteenth century, for instance, created higher profit in this branch of trade. Europeans learned how to deal with specialized poles of production.

Product innovation: Thirdly they learned how to avoid overstock. The English East India Company, for instance, bought hundred of thousands of ready-made shirts in India in the 1690s, most of which remained unsold in London. The reduction of the profit margins during the first half of the eighteenth century made it imperative to control fluxes more efficiently. Hence the importance of monitoring markets (both supply and selling markets), for instance adapting Indian products to suit European tastes, as in the case of the so-called ‘blue on white’ cottons for the European market instead of traditional ‘white on blue’ textiles used in India.

Craig Muldrew (Cambridge)

'Th' ancient distaff' and whirling spindle': measuring the contribution of spinning to household earnings and the national economy in England 1550-1770

The history of spinning occupies a very unusual place in current British economic history. Despite the vast increase in the numbers of books on women's history and on women's occupations, spinning has received little attention. Most work tends to dismiss spinning as unworthy of extended discussion by claiming that it was unskilled and poorly paid. However, for most women by far the most important source of potential income came from spinning. Just about all of the millions of yards of woollen yarn that went into making English cloth had to be spun by women and children, but this activity has simply been treated as an adjunct of housework, and has not been assumed to have been of much value in market terms. But this is simply wrong, as spinning was a simple, but highly skilled occupation where there was a great demand for the best quality product. Fine clothes could not be woven and fulled without strong yarn, and especially with the introduction of the lighter fabrics known as the new draperies, skilled spinning commanded a premium and some wages quoted were higher than those of men.

One other reason for the historiographical neglect of spinning is that hand spinning had gone into decline by the time Frederick Eden and David Davies came to compile their household budgets of poor families in the 1780s and 1790s. But as Eden noted on a number of occasions, the invention and application of the various forms of spinning machinery had vastly reduced the demand for labour needed to spin both wool and increasingly cotton. Eden quoted a pamphlet of 1788 which estimated even by that time there were over 20,000 machines with 80 spindles or more just for the spinning of cotton, but 25 years before all of this would have had to have been spun on single wheels or distaffs.

The purpose of this paper will be to estimate the workforce involved in spinning from the late sixteenth century until the eve of mechanization. In addition, the potential contribution to family earnings from spinning will be examined. Because of the importance of the woollen industry to Britain's balance of trade many people wrote pamphlets or advice to the Privy Council estimating the output of, and employment provided by cloth production. In addition, customs records have been used to quantify exports. From this information it is possible to make general estimates of the amount of spinning needed in the economy, and its cost. This evidence shows that employment in spinning increased dramatically from the late seventeenth century, and continued to increase until there were probably over one million women and children employed in spinning by the mid-eighteenth century. In addition, earnings also increased to the extent whereby earnings from spinning could contribute from 30 per cent to over 50 per cent of household income for poorer families. This has enormous implications for looking at trends in real wages over time, as well as for the concept of the industrious revolution.

I/C New Share Issues and Corporate Law

Chair: **Valerio Cerretano** (Bozen/Bolzano)

David Chambers (Oxford)

New issues, new industries and firm survival in interwar Britain

In the early 1930s, the London capital markets were rocked by the Royal Mail scandal, the Enron of its day. In a similar vein, both the serious financial press and contemporary economists were appalled at the poor survival record of the 1928 IPO cohort, approximately half of which had failed by the early 1930s. In stark contrast, blue chip firms such as Boots, Morris Motors, Marks and Spencer, and Ford Motor chose to go public on the LSE in the 1920s. Moreover, investors returned in short order and in considerable numbers to buy new issues once more in the mid-1930s. So which picture is correct? Was the LSE little more than a casino, or did it make a meaningful contribution to industrial development in interwar Britain?

The analysis draws on a new database covering approximately over 1,000 IPOs on the London Stock Exchange from 1919-38 and comprises information on the type of security issued, the details of the offering, the characteristics of the firm, as well as the stated reasons for going public, and whether the firm survived over the following 5 to 10 years. I address two important questions with this dataset. Firstly, to what extent did the new issues market contribute to the structural shift toward the emerging 'new' industries in interwar Britain measured in terms of new money raised relative to capital expenditure commitments? Secondly, were the firms going public of good quality, or were they opportunistic schemes thought up by unscrupulous promoters to dupe investors? Echoing an earlier work by Foreman-Peck,¹ were these firms 'seed corn' or 'chaff'?

In answering the first question I revisit previous estimates of aggregate new money raised compiled by the Midland Bank Review, and also provide a more precise industry breakdown based on 1948 SIC coding. Empirical corporate finance studies of developed countries in the last quarter century suggest equity issuance has made little or no contribution to industrial finance once acquisition activity and share repurchases are netted out. The first section of the paper examines whether an interwar stock market which had not yet discovered share repurchases or embraced significant M&A activity made a more significant contribution to industrial finance, and in particular to those industries reliant upon external equity finance.

To address the second question I employ survival time analysis, and compare the experience of IPOs with those of the US in the same period. This section of the paper draws attention to the overlooked but very favourable post-1929 recovery of the London new issues market compared to the US, both in terms of activity and survival rates, and that this occurred in spite of Britain opting for self-regulation over not introducing its own version of the 1933 Securities Exchange Act.

Carsten Burhop (Münster)

Financial development and corporate law: historical evidence from the German IPO market, 1870-96

This paper examines the effects of changes of corporate law on stock market development and the moments of returns on the market for initial public offerings (IPOs) in Germany between 1870 and 1896. After the implementation of free incorporation of joint-stock companies in Germany during 1870, the stock market boomed. The number of listed companies, share prices, and the market value of listed companies in per cent of GDP were as high in 1872 as in 1913. In particular, more than 400 corporations went public within just three years. Until 1880, nearly half of the new corporations were de-listed from the stock market, share prices declined, and the stock market value of listed corporations in per cent of GDP halved. Investors lost confidence in IPOs and nearly no IPO was undertaken between 1874 and the early 1880s.

¹ James S. Foreman-Peck (1985), 'Seedcorn or Chaff? New Firm Formation and the Performance of the Interwar Economy' *The Economic History Review*, Vol. 38, No. 3, pp.402-22.

After a prolonged and controversial debate in German parliaments, between academics, and in the financial press, a new joint-stock company act came into force in 1884. The aim of this new legislation was the stronger regulation of IPOs. In fact, activity on the IPO market substantially increased after the reform. In this paper, we are going to test if the reform influenced the initial returns and share premiums of IPOs and compare our findings with similar results for seasoned equity offerings (SEOs) of Germany's leading corporations over the period 1870-96. Our sample includes 123 IPOs and 55 SEOs.

We expect that the reform did not influence the average initial return of IPOs and SEOs, but that the share premium – the difference between the face value of a share and the flotation price – increased after the reform of the joint-stock companies law in 1884. A legal reform should not influence the mean initial return of investors, but it should influence the risk of being a first investor. Risk was reduced by better information given to investors. Regarding SEOs, investors were already well informed, and we therefore did not expect any influence of the reform on the initial returns of SEOs. Moreover, we expect a rising share premium since the 1884 reform increased accountability of managers for the valuation of assets. The market will thus expect that the assets of a corporation are more conservatively valued after the reform, increasing the possibility of higher share premiums.

In fact, the mean initial return of IPOs was not influenced by the reform, whereas the variance of initial returns declined. On the other hand, the mean share premium was higher after the reform than before, whereas the variance of share premiums remained the same. Turning to SEOs, initial returns were not affected by the reform. On the other hand, the mean share discount decreased.

To sum up, the reform of the German joint-stock companies act in 1884 reduced the risk for first investors in IPOs and induced a more conservative valuation of company's assets. Thus, the reform, which was aimed to reduce problems of IPOs, fulfilled it aims.

Gerben Bakker (London School of Economics)

The emergence of rights-based multinationals: sunk costs, property rights and the political economy of globalization, 1945-2000

Industries dependent on the existence and enforcement of intellectual property rights, such as music, motion pictures, pharmaceuticals and computer software, have become increasingly important during the twentieth century. Later in the century, changes in the business environment increasingly favoured transactions through the market. This became visible through the growth of venture capital, the number of start-ups and out-sourcing by large corporations. At the same time, markets for rights-based products were expanding rapidly. Yet, in many rights-based industries concentration increased. This paper argues that in each of these businesses a few multinationals developed a new rights-based organizational structure that enabled them to survive and prosper in an adverse environment that was pulling activities away to smaller local firms and market transactions.

The paper characterizes a rights-based multinational as an organization that links an international federation of R&D units to a global distribution system. The latter has subsidiaries in all major markets and a minimum scale and scope. It guarantees distribution access and captures the rents of the intellectual property rights generated by the federation of unevenly dispersed creatively autonomous R&D units. Each of these units has a *maximum* scale and scope and often emerged by self-organization: generally they were only acquired after they had survived a competitive process independently. Frequently a multinational only owned part of the unit. An R&D unit enabled the multinational to tap into local-geographic and segment-based knowledge networks. In music, the units were the record labels, in pharmaceuticals R&D-labs and small biotech companies. The portfolio of rights generated by the federation enabled the multinational to diversify risk.

Based on detailed archival sources and both qualitative and quantitative analysis, this paper further explores the characteristics of the rights-based multinational originally identified by Bakker to understand the music industry's evolution since 1945.² Combining business history with

² 'The Making of a Music Multinational: Polygram's International Businesses, 1945-1998,' in: *Business History Review* 80 (2006), pp.81-123.

transaction cost economics, the present paper compares the postwar development of rights-based multinationals in industries such as pharmaceuticals, software and music. It then moves on to analyse the political-economic implications for the debate on globalization.

A key feature of rights-based multinationals is that sunk costs are extremely high and marginal costs infinitesimal. This gives the rights almost quasi-public good characteristics and makes supply potentially unlimited. Multinationals can set the price far above marginal cost because of intellectual property rights. The paper discusses how this feature contributes to political, economic and social frictions. Politically, for example, multinationals distribute media outputs from 'modern' high-income countries to less modernized countries at low cost. This can affect modernization processes substantially, contributing to internal political friction and to international unrest, perhaps even terror. Economically, rights-based multinationals often drain away a country's foreign currency. In postwar reconstruction Europe, for example, governments' attempts to limit repatriation of payments for US films led to substantial trade friction with the US. The sums involved could make up as much as 5 to 10 per cent of a country's dollar 'deficits'. Likewise, nowadays many people are suffering from diseases for which the marginal cost of treatment is small. Yet, often the treatments are not provided, which results in intense friction between developing countries and rights-based multinationals, such as recently in Brazil and Africa over antiviral medicines.

On a social level, rights-based multinationals might affect the prospect of low-paid workers. Labour-saving innovations used to be adopted when machinery rentals were lower than labour costs. Cheap labour could thus keep employment up. Certain high-sunk-cost innovations, however – such as software that automates administrative tasks – have marginal costs that approach zero. In countries with weak property rights regimes, and in all countries in the long run, this means that part of low-cost labour can potentially be automated away far more easily and rapidly.

This research is worthwhile because it examines how the dynamics of basic economic industry features and shifting institutional settings can lead to organizational changes that in their turn affect the political economy. Second, it is relevant because rights-based industries are making up a growing share of assets, economic activity and exports, but have never been identified and analysed historically as a group. Third, their development has had significant political economy implications, both regarding legal-economic institutions and regarding trade friction between developed countries with rights-based industries and less-developed countries without. With the increasing prominence of rights-based multinationals, these frictions can become more frequent. This paper may therefore not only give insights into past developments, but also in the shape of things to come.

Keywords: intellectual property rights, law and economics, institutional economics, evolution of multinational enterprise, rights-based multinationals, transaction cost economics, sunk costs, innovation, media, pharmaceuticals, software, globalization, high-technology trade friction.

I/D Money and Microcredit

Chair: **Francesca Carnevali** (Birmingham)

Montserrat Carbonell Esteller (Barcelona)

Microfinancial institutions and the periphery of financial systems in Spain in the nineteenth century

In Catholic Europe the periphery of the formal sector of the financial system in the nineteenth century was integrated by *montes de piedad*, *montepios* and savings banks. *Montes de piedad* and *montepios*, were institutions mainly dedicated to small credits in exchange for the pledging of objects. The limits of credit institutions meant that, unlike traditional moneylenders from the informal sector, they did not have sufficient information on borrowers, on their solvency and on whether or not they intended to repay the credit. The solution to this problem came from the guarantees that the bank demanded on granting a loan. Consumer credit thus took the form of chattel credit. The pledge was, in short, what allowed the institution to take on the risk and the uncertainty regarding the repayment of the loan. The conditions of the loan, that is of the pledge, regulated this risk. The difference in the conditions of the guarantee, that is of the pledge, and of the loan opened the door to different institutions finding their own clients.

The aim of this paper is to analyse a formal network of very similar but complementary institutions in Barcelona of the mid-nineteenth century. Three popular credit institutions coexisted: the former pawnshop (*Monte de Piedad de Ntra.Sra.de la Esperanza de Barcelona*, 1751), which acted as both a chattel credit and a savings institution, the Savings Bank, *Caja de Ahorros de Barcelona* (1844), where clients opened their accounts and deposited their savings, and another pawnshop, the *Montepio Barcelonés* (1846), which consisted of a chattel credit entity whose capital came from the Savings Bank.

This paper shows two main evidences. First, that in mid-nineteenth century Barcelona, the micro credit or consumer credit market in the formal sector was segmented and composed of a dense institutional network aimed at different clients, with a different offer of products and credit conditions. Second, in the financial crisis of the end of the 1840s, merchants and shop keepers obtained money quickly in exchange for depositing their products in the institutions, or also informal lenders, who used the *Montepio* to deposit chattel of their clients. The periphery of the formal financial system was thus converted into an enormous dynamic place of interaction between the formal and informal sectors.

The microcredit institutions characteristic of the Catholic countries of Southern Europe (*montes de piedad*, *montepios*) contributed, together with savings banks, to the sustainability of the set of transformations that marked the beginnings of the process of the economic and political modernization of Spain in the second half of the nineteenth and the beginning of the twentieth century.

George Selgin (Georgia)

Monopoly, competition, and Great Britain's 'big problem of small change'

In *The Big Problem of Small Change*, Thomas Sargent and François Velde (2002) describe and analyse Western nations' long struggle to create workable small change systems – systems capable of maintaining adequate stocks of both small- and large-denomination coins without resorting to coins of inconvenient size and without inviting extensive counterfeiting. Sargent and Velde view the solution of the small-change problem as a matter of implementing what they term the 'standard formula' for a viable system of small change. According to Carlo Cipolla's (1956, p. 27) classic statement, that formula calls for token coins (coins, that is, 'having a commodity value lower than their monetary value') issued on government account and convertible into the money that defines the monetary unit.

Why did it take so long for governments to solve the small-change problem? Sargent and Velde (2002, p. xviii) reduce the question to a more specific one: 'Was it poor economic theory or inadequate technology that long delayed the proper implementation of the standard formula?' Their

answer is that it was both. Although national mint authorities ('policy experts') 'struggled' to solve the small-change problem, they were forced to 'strain against constraints' posed, first by their failure to grasp the standard formula, and then by a lack of technical means for implementing that formula (*ibid.*, pp. xviii, 13 and 23).

I show, with particular reference to Great Britain, that theoretical and technical constraints alone cannot account for the persistence of the small-change problem. I then propose an alternative, institutional explanation for the problem's persistence. I claim that the organization of Great Britain's official coinage system, and the monopolistic structure of that system especially, undermined incentives for implementing crucial elements of the standard formula even when technical means for doing so were at hand. Poor incentives translated into coining policies and procedures which, though optimal from authorities' point of view, were not so from that of the general public.

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David Humphrey (Royal College of Art)

The development of the goldsmithing trade in late medieval Northern Europe

In the period between c.1250 and c.1450, the goldsmithing trade in Northern Europe underwent considerable structural change and expansion in reaction to increasing demand and parallel changes in the role of the goldsmith. Small scale producers continued to inherit, or setup, and run businesses in the major centres of production, but they found themselves increasingly competing with larger-scale enterprises which cornered more and more of the lucrative markets found at the various courts of, amongst others, France and Valois Burgundy. By the middle of the fifteenth century demand at the leading courts required the sourcing of precious metals and gemstones for the construction of thousands of precious objects per year. Much of the material was found through the recycling of unwanted or stylistically old fashioned jewels and objects – but the challenge increasingly became to obtain not only precious materials in quantity but also of a sufficiently high quality to satisfy would-be customers. In this respect middlemen acting as brokers grew ever more influential in both sourcing materials and providing finance or loan services to obtain such items.

As the period progressed, some goldsmiths themselves developed their businesses far beyond the making of precious objects – to the supply of complex financial services, the brokering of political deals and the direct underwriting of royal or ducal debt. They had to develop skills that enabled them to deal with a society that increasingly saw their work as assets to be traded or as inducements, or for direct gain in other spheres of business and political activity. This developing strata of nouveau riche paralleled more established structures of middlemen and brokers. Such was the demand in Northern European courts for precious objects during the period that it was possible for new players to enter the market – monopoly situations were rare as demand drove an ever expanding market too large for true monopolies to develop although key makers and financiers did emerge across Northern Europe.

This paper examines the structure of the trade in Paris from the beginning of the period and traces the circumstances and developments that allowed certain goldsmiths to transform their businesses into large-scale financial operations. Beginning with the structure of small-scale, single-master entities, it examines the training process, the acquisition of precious metals and gemstones, the expanding role of middlemen and brokers in the operation of the trade and the transition of some goldsmiths from makers to providers of financial and political services. Although key focus is on developments in Paris which, for much of the period, was the leading centre for goldsmithing in Northern Europe, practices and structures found in the Parisian trade are generally representative of those to be found in other leading northern European cities of the time.

The period also saw the development of technical processes in goldsmithing that opened up the possibilities for innovative design thinking and a consequent move away from the essentially brutish objects of the Gothic mainstream. Objects became more obviously narrative in design terms and when coupled with advances in gemstone cutting and setting they began to explore a new design language in which space was not so much surrounded by form but one in which that space and form were integrated into more complex structures. Emanating largely from within the world of Parisian goldsmithing these innovations spread very rapidly through the courts of Northern Europe. With corresponding simplification in the field of high-quality garments, a new landscape for the display of precious jewels was created.

In the closing decades of the period the trade fell victim to changing political circumstances that saw the relatively rapid decline of Paris as the key centre of manufacture. Would-be patrons relocated elsewhere in France or to other European locations which saw the dispersal of skilled workers to those new locations and elsewhere. With that relocation, came changes in attitude to the nature and style of goldsmiths' work brought about by new viewpoints on the part of patrons and influences which came to bear on design thinking. The final section of the paper examines the reasons for that decline and the geographical relocation of the trade which ensued. Rather than seeing it as a generic decline in the trade itself, it is considered as a point of change and renewal.

Few pieces of precious metalwork from the period under consideration are extant due to a variety of reasons including recycling, loss and destruction. Examples of those pieces that are extant will be shown with details of their history where it has been established.

I/E Business Performance and Regulation

Chair: **Regina Grafe** (Northwestern)

Mark Casson (Reading)

The regulation of the Victorian railway system

The Victorian railway was a major experiment in using private enterprise to construct and operate a national transport network. Government sought to foster competition whilst securing private profit for socially beneficial schemes. Railway companies' need for joint stock status and powers of compulsory purchase gave government considerable leverage over railway investment decisions. Government powers increased further as passenger safety and workmen's fares emerged as important issues.

In implementing transport policy, analogies between investment in railways and investments in turnpikes and canals proved to be misleading. Vertical integration of track and trains quickly emerged as the preferred method of railway organization. Critics of government policy argued that this undermined the case for competition between private companies. It was suggested that railway companies would collude and that this would result in high fares and poor service to industry.

Recent research suggests that while railways colluded over price, they competed to build new lines. Competitive building of new lines resulted in excess capacity on the system. Excess capacity, in turn, may have allowed inefficient operating practices to persist. Diminishing returns to capital suggest that excess capacity would eventually be checked by declining rates of profit which would discourage further investment. But while such checks occurred, they seem to have been weak.

In principle, standard theories of regulation should explain this pattern of behaviour, but in practice they do not. Most theories of regulation are prescriptive; they deduce what an efficient regulator would do, but do not explain how companies will respond to inefficient regulation.

This paper sets out a new theory of regulation in network industries which is specifically designed with historical applications in mind. It examines in detail the implications of private competition in a network industry. The basic idea is that each private operator will attempt to build their own self-contained network. As rival networks expand, the network with the highest density of terminals will obtain the greatest market share. But connectivity as well as density is important in a network industry. As density increases, so the number of pairwise connections increases quadratically, so that there are increasing returns to density. These increasing returns stimulate over-capacity. Network size stabilizes where the returns from higher density are just offset by the financial burden of excess capacity. If increasing returns are modest this may occur before profits have fallen to a break-even level, but if returns are high then profits will directly check growth.

The paper shows that historical evidence supports both the *assumption* of this model, that private companies strove to build national networks, and the *implication* of the model, that excess capacity emerged as a result of increasing returns to private network size. It is argued that government policy was in error in condoning the development of rival private networks. Potential gains from competition were dissipated through wasteful excess capacity. Government should have imposed lower freight rates and passenger fares in order to eliminate the profits out of which the excess capacity was financed. Greater financial stringency would have encouraged companies to maximize the potential of their local and regional networks, and to cooperate more fully in the operation of the national network.

Dan Bogart (California-Irvine)

Private ownership and the development of transport systems: cross-country evidence from the diffusion of railroads in the nineteenth century

Railroads were the leading infrastructure investment of the nineteenth century. Entrepreneurs and government officials were particularly keen to promote railroads because they opened new markets, developed the economy, and enhanced military capability. The financial and human resources required for the construction and operation of railroads were mobilized through two different forms

of ownership or control. The first was government ownership and operation, in which local or central governments borrowed capital from home or abroad and directly hired the skilled workers to construct and manage their railroad network. In the second form, private companies built, operated, and owned railroads, usually with the aid of government subsidies, like interest guarantees, dividend guarantees, and land grants. In this paper, I investigate whether the two forms of ownership had implications for railroad diffusion. Preliminary results suggest that countries with greater private ownership had higher railroad miles per capita.

The paper uses a new dataset on the number of railroad miles owned by companies and the government in each country between 1840 and 1912. The data reveal that private ownership was especially common during the mid-nineteenth century when railroads were beginning to diffuse in Britain and the United States. Government ownership became more common in the 1880s and 1890s when European countries began constructing publicly-owned railroads or nationalizing existing lines. In other parts of the world, ownership patterns varied with some exhibiting more public ownership and others relying on private ownership with government assistance.

There was significant variation in the degree of private ownership across countries between 1840 and 1912. In the United Kingdom, private companies owned the entire railroad network from the beginning up to 1912. Many continental countries also relied on private ownership initially, but starting in the 1870s they shifted to more government ownership through the construction of new lines or the nationalization of private lines. Nearly all continental and Scandinavian countries had substantial government ownership by 1912 with the exception of Spain, which like Britain, continued to have a privately owned railroad network.

Ownership policies also varied outside Europe as well. Government ownership was common in Australia and New Zealand from the outset, but it was rare in the United States and Canada. India started with substantial private ownership, but then shifted towards greater government ownership in the 1870s. Many Latin American countries had a mixture of private and public ownership. For example, in Brazil around two-thirds of railroad miles were owned by private companies until the early 1900s when government ownership increased. Government ownership was dominant in Japan during the 1870s and early 1900s, but not in between. Finally, in China, the government constructed and owned most of the initial lines, but after 1900 private ownership became increasingly common.

This paper investigates whether the degree of private ownership affected railroad diffusion during the nineteenth century. Private ownership could have a variety of effects on network expansion. Private ownership could increase diffusion if companies have greater access to capital markets, or if the profit motive makes them more effective in identifying and building lines. On the other hand, private companies do not internalize all the social benefits from railroads. In such cases, government ownership could result in greater diffusion, because the state internalizes benefits like the enlargement of the tax base, improved military capability, and political unification.

The effects of private ownership are evaluated using panel data regression techniques. I test whether the growth of railroad miles per capita in country i in year t increases with changes in the fraction of railroad miles owned by companies in country i in year t , after controlling for other factors like the growth rate of GDP per capita, the growth rate of population density, changes in interest rates, and lagged values for the growth and stock of railroad miles per capita. The degree of private ownership is measured by the fraction of railroad miles owned by private companies in each country. If there is a positive relationship between the growth in railroad miles per capita and changes in the fraction of miles owned by companies then it is possible that private ownership increased railroad network expansion.

The preceding analysis may produce misleading results because of the endogeneity of private ownership. It is possible that private ownership increased in countries that were growing more rapidly, or whose institutions were changing. I address endogeneity by using fiscal, political, and military variables as instruments for the degree of private ownership. The IV approach will yield consistent estimates as long as fiscal, political, and military variables do not influence railroad diffusion except through ownership structure.

The OLS results show there is a positive and statistically significant relationship between the growth in railroad miles per capita and changes in the fraction of miles owned by companies. The first-stage IV estimates show that greater population density and greater constraints on the executive contributed to private ownership. The second stage IV estimates show that railroad miles per capita increased with the fraction of railroad miles per capita, but the standard errors are much higher. Overall there is evidence that private ownership was associated with network expansion, but it is not clear that the effect was causal.

The results add to the literature on the causes and consequences of private sector participation in infrastructure. Robert Millward (2004) argues that private ownership had little influence on railroad diffusion in nineteenth century Europe. The findings here show that private ownership likely had a greater influence outside of Europe. Scott Wallsten (2005) argues that telecommunications diffused more slowly in countries where the government had a monopoly or where companies faced capricious regulation by the state. My findings suggest a similar conclusion because they show that private ownership of railroads was more common in countries with greater constraints on the executive. This suggests that companies were more likely to promote new railway projects if they believed their investments were safe from expropriation by the government.

Jesús Mirás Araujo, Carlos Piñeiro Sánchez & Gustavo Rego Veiga (La Coruña)

Water management regulations in Spain: EMALCSA, and the city of La Coruña's water supply, 1975-2004

There have been several legal and political regulatory frameworks throughout history that have influenced the success or failure of business in different ways. When the focus of the analysis is an industry or a service which is publicly owned and run, the institutional environment becomes even more important. In these activities the borders between efficiency and the interests and welfare of the population become blurred. These are issues that touch upon other currently vibrant debates involving the dichotomy between public and private enterprise.

One of the services that has received increasing academic attention in recent years has been the water supply sector. There has been growing concern about the systems of ownership and management that might be capable of guaranteeing higher levels of efficiency of provisioning, and essentially, this has focused on the relative advantages of either public (municipal) or private ownership. In short, research tends to weigh the policies of water service privatization and nationalization, a debate that has been gaining academic momentum since the 1980s.

The aim of this paper is to examine the effects of the changes in the institutional regulation of water supplied in Spain during the democratic period (1975-2004), after a long dictatorship (1939-75), a stage that created an anomalous institutional framework. This analysis focuses on a water supply firm based in a medium-sized city in Northern Spain.

The way in which the service in the city has been managed has undergone numerous changes and has been subject to a long period of transformation. At the beginning of the twentieth century the service was placed in the hands of private enterprise, under a municipal franchise (concession) system. With the advent of the dictatorship, the regulatory environment gradually began to change, and this dramatically altered the attitude of public authorities with respect to collective services. As a result, there was increased pressure on private firms to relinquish their hold on the service in order that they might revert to public authority control, specifically to the local (municipal) authorities. This process came to a conclusion at the end of the dictatorship.

The paper is divided into three main parts. First, there is a summary of the relationship that existed between the water supply service itself and the institutional frameworks under which the service was established. Second, there is a description of the antecedents of water provision regulation in Spain and a study of the parameters of the more recent, more 'standard' institutional framework set in place during the last quarter of the twentieth century. Finally, the analysis of Spanish water supplies looks through the lens of the water supply company of the city of La Coruña, based, essentially, on the firm's financial information.

In most of Spain, private companies began to take on the role of management for public utilities during the 1980s. However, in La Coruña the water supply service became publicly owned in the mid 1970s. This process bucked a trend that was to take place in most of the rest of Spain during the 1980s, mirroring similar privatization processes taking place across Europe.

The biggest challenge for the service during these years was increased demand. Both urban and metropolitan growth meant that there was an imperative need to enlarge water supply infrastructures, and this process was effectively completed by the mid 1970s. These improvements were augmented throughout the 1980s by the creation of waste-treatment plants.

The transfer of the service to municipal control in La Coruña enabled the company to ensure its solvency. The change in the ownership of the service did not significantly alter the management model however. What it did was to provide greater financial stability and place the service in a position to be eligible for public subsidies, which in turn, facilitated the creation of new infrastructures for tap water, water-treatment and distribution. This network enabled the company to guarantee the city's water supply and ensured a sustainable basis for income growth. From this perspective, the municipal authorities control of the service may be interpreted, not as a response to the structural difficulties inherent in the nature of the water supply business, but as a way of escaping from a quite specific, delicate financial situation, which had been exacerbated by a climate of national economic stagnation.

Throughout this period the customer base of the service also changed. The geographical scope of the company expanded, the city grew, and the service was extended to neighbouring municipalities. At the same time, the proliferation of small, service-orientated businesses in industrial areas in the periphery of La Coruña, and the emergence of large-scale consumers (such as the oil refinery), caused a qualitative transformation in the service's demand characteristics. Nonetheless, there was no evidence to suggest that these changes had a significant influence on the financial results of the company.

The rationalization of the service's activity – when the new infrastructures became operational – made it possible to reduce the volatility of costs and hence, to bring the income derived from the service more in line with the real volume of water consumption and changes in demand. The consequent stability of the business has provided an opportunity to adopt a steadier, more balanced structure for capital, resulting in enhanced profitability for the company.

II/A Invention in Industrial Revolution

Chair: **Craig A Nard** (Case Western Reserve)

Robert C Allen (Oxford)

Economics, science, and the British industrial revolution

The paper argues that the industrial revolution was the result of the expansion of the early modern economy, in particular, the enormous growth in British trade that took place between 1500 and 1800. Expanding trade induced the growth of London from 50 thousand to 1 million and similar growth in other cities. The urban expansion, in turn, led to a strong demand for labour and the creation of a high wage economy. Moreover, the growth in London led to the creation of the English coal industry, far and away the largest in Europe.

The upshot of these developments was that Britain, and especially northern Britain, had a unique structure of wages and prices in the eighteenth century. Wages were exceptionally high at the exchange rate and in comparison to the cost of living, the price of capital, and the price of energy. This unusual price structure made research and development highly profitable and led inventors to search for techniques that raised the capital-labour ratio and the energy intensity of production. These techniques were the hallmarks of industrialization.

Science made a limited contribution to these inventions. Two general purpose technologies of the industrial revolution were steam power and ‘clock work’ – the use of gears to transmit power and control machinery. Both had scientific roots in that they can be traced back to the scientific discoveries that the atmosphere has weight and that pendulums of a given length have a specific period of oscillation. These connections prove to be tenuous, however, when they are examined in detail. Moreover, the exploitation of the scientific ideas required R&D programmes, which means that invention responded to economic incentives: It was profitable for Newcomen, for instance, to develop his engine in Britain, but it would not have been elsewhere in the world.

The inventions of the industrial revolution cannot be understood apart from economic incentives that induced them, and the price structure that generated those incentives links the industrial revolution back to the commercial expansion of the early modern economy. The industrial revolution was an economic rather than a scientific phenomenon.

B Zorina Khan (Bowdoin) & **Kenneth Sokoloff** (UCLA)

The evolution of useful knowledge: great inventors, science and technology in British economic development, 1750-1930

The role of science and technology in the British industrial revolution has been widely debated, but conclusions still differ about the extent to which the economic advances of the period owed to scientific inputs.

We employ detailed information on a sample of over 400 British ‘great inventors’ who were included in biographical dictionaries because of their contributions to technological progress over the period from 1750 to 1930. We were thus able to trace the inventors who received formal training in science and engineering, as well as wider dimensions of achievement such as membership in the Royal Society, scientific eminence, and professional publications. The variables from the biographical entries were supplemented with information from patent records on the numbers of patents filed over the individual’s lifetime, the length of the inventor’s patenting career, the industry in which he was active, and the degree of specialization at invention.

The analysis focuses on the evolution of different types of knowledge in British industrialization, and explores the determinants of shifts in the frontiers of technology during early economic growth. The results indicate that a discrete change in the nature of technological knowledge inputs occurred toward the end of the nineteenth century. Although scientists proved to be just as responsive to economic incentives as ordinary technicians, prior to the 1870s formal scientific training was not associated with superior productivity at invention. The relative loss of technological competitiveness that Britain experienced owed in part to institutional deficiencies such

as educational and patent systems that were biased toward individuals from wealthy or privileged backgrounds, and slow to implement necessary changes.

Andrew P Morriss & Craig A Nard (Case Western Reserve)
From the Courts to Congress: the evolution of Patent Law, 1790-1952

This paper analyses the evolution of US patent law between the first patent act in 1790 and 1952. During this time, patent law evolved through different sets of institutions. During most of the nineteenth century, patent law developed in the courts. A relatively small patent bar, a subset of the judiciary, and a small number of repeat parties were involved in a surprisingly large proportion of patent cases. Yet at several junctures, most importantly with the major changes introduced in 1836 but also through minor statutory changes throughout the nineteenth century, Congress intervened to alter the patent statute.

We argue that this evolution is best understood through an interest group-based analysis, focused on the question of the choice of institution to alter the law. The courts and Congress each present interest groups with a different menu of costs and benefits. Although the federal courts have generally been viewed as relatively costly to capture, because of the lack of docket control, the general jurisdiction of the courts, and the unpredictability of juries, we argue that the nineteenth century federal bench was less costly to influence than Congress in many instances. Because a relatively few judges heard the vast majority of patent cases and because the patent bar and judiciary were able to reach agreement on the appropriate evolution of patent law, much of the evolution of the patent system occurred through the courts.

Patent interests turned to Congress for two reasons. First, despite the general agreement among bench and bar on the appropriate evolutionary path for patent law, there remained in American law a powerful strain of anti-monopoly thought, hostile to patents. Although most patent cases ended up litigated before sympathetic judges by the skilled patent bar, not every patent case did so. Given the democratized state of patent practice, patent law touched individuals spread across the country, making litigation before judges with an anti-monopoly orientation a real risk. Patent interests therefore turned to Congress on occasion to 'lock in' changes in the law which they had achieved through the courts (for example, the 1836 Act's introduction of the patent claim, which had previously developed less formally through practice). They also sought Congressional aid in correcting occasional dead-ends reached in the law's development.

The paper is the second instalment in our larger project of explaining patent law's evolution in an interest-group perspective. The earlier paper addressed the creation of the patent clause of the US Constitution and its intellectual origins in earlier Venetian and British patent systems. The final piece considers US patent law from 1952 to the present.

II/B London Apprenticeship

Chair: **Jane Humphries** (Oxford)

Alysa Levene (Oxford Brookes)

Pauper apprenticeship, the industrial economy, and the old Poor Law in London

Many assumptions have been made about child labour in the early period of sustained industrialization in England. In particular, the factory has been taken up as a central motif, with pauper apprentices being especially characterized as fodder for this new workforce. In this paper, it is argued that historians have looked for mass bindings to northern cotton manufactories, and that they have failed to appreciate that such cases, although high profile, were often numerically relatively unimportant. The apprenticeship records for 10 London parishes of varying socio-economic profiles, and for the London Foundling Hospital, have been used here to critically re-examine the role of pauper apprenticeship in the period of early industrialization. Three principal questions are asked of the data in order to probe the role of child labour in economic development, the pace of growth of different occupational sectors, and the role of London in the advance of regional economies. These are: firstly, what age were London pauper apprentices at binding? Secondly, in what types of trades were they placed? And thirdly, to which areas of the country were they sent? The investigation reveals that pauper apprentices were young on average at binding; that traditional areas of manufacture were frequently of much greater significance than factories; and that apprenticeship from parishes and a charity like the Foundling Hospital may have been based on quite different networks of information and expectations. In particular, the apprenticing of pauper children continued to be of significance to parish and charity authorities under the Old Poor Law, in a way which gave it quite different characteristics from the work of poor children living with their families.

Despite their numerical significance and their place in the conceptual framework surrounding early industrial development, the characteristics of pauper apprentices have rarely been examined in any detail. The research questions asked in this paper allow the role of poor children in the burgeoning industrial economy to be pinpointed for the first time. Age patterns are suggestive of attitudes towards child labour from both potential masters and binding authorities. A younger age at binding indicates perceived practical or cost benefits of juvenile employment, perhaps linked specifically to the availability of poor children. The types of trades commonly used for pauper bindings are indicative of wider patterns of economic development, and show whether poor children did indeed supply a specialized part of a new, mass workforce, or whether they remained tied to older patterns of employment. This, in turn, will direct the spotlight to continuity or change in the occupational profiles of child labour, which has an impact on our perceptions of the pace of industrial growth. Lastly, the regional patterns of pauper apprenticeships from London tell us much about the impact of the capital on the local pace of industrialization

Katrina Honeyman (Leeds)

The London parish apprentice and the early industrial labour market

The full extent of the contribution of the parish apprentice to the labour force of the early textile manufacturing will never be known, but the evidence of the study from which this paper is drawn indicates its importance as a source of youthful labour, and in providing much needed flexibility at a time of changing labour requirements. Although parishes in all regions of the country contributed to the initial supply of textile factory workers, this paper explores both quantitative and qualitative dimensions of apprentice labour from a sample of 23 London parishes. Using the data from parish apprenticeship registers and indentures, it argues that the extent to which poor children were made available to factory owners, and the gender composition of those children, were shaped by local labour market conditions; and during the period between 1780 and 1820, textile factories – in the south and midlands of England as well as in the north – absorbed the majority of the available poor children of several London parishes in which local apprenticeship opportunities were apparently limited. Then, drawing on the qualitative evidence contained in minutes of the meetings of poor law

officials, reports of factory visits, and interviews with parish apprentices themselves, all of which provide a remarkably comprehensive paper trail, it is argued that the process of factory parish apprenticeship was both more complex and more formal than usually thought; and that in comparison with the alternatives that existed for poor children at the time, conditions were less universally bleak than conventionally supposed. It challenges the assumption that parishes used factory apprenticeship solely, or mainly, to dispose of their poor children, demonstrating that at least as much care was taken over factory bindings as other types.

By examining evidence of the nature and gendering of factory work, and information on outcomes, some light is shed on the life chances of factory parish apprentices. The accusation that parish factory apprentices were 'fictive' – especially in comparison with bindings to local trades – is found to be only partially true. Evidence collected so far suggests mixed fortunes: children were abused and exploited; but they were also trained, both in the specialist requirements of factory workers, and in the general, transferable skills of literacy, numeracy and, in the case of girls, domesticity. Those children, mostly girls, who continued as textile factory workers upon expiry of their apprenticeship were by no means exceptional, though examples exist of children returning to their birth parish and applying their skills to work in the metropolis.

Jeremy Boulton (Newcastle) & **Leonard Schwarz** (Birmingham)

Parish apprenticeship in eighteenth century and early nineteenth-century London

This presentation will seek to consider how far, if at all, apprenticeship amongst the poor in eighteenth-century London adapted itself to a changing economy. It will compare 1715-50 with 1750-1815. In the first period London was characterized by high mortality, little military recruitment until the 1740s, and a relatively slow rate of economic and demographic growth. Because of the low price of bread, real wage rates were higher than they had been before and would be subsequently. However employment was depressed. The 1720s was when London's workhouses were built and parish poor relief were restructured – this took place mostly in the capital's rapidly growing suburban districts. 1750-1815, on the other hand, saw lower (and sometimes falling) mortality, considerably more rapid economic growth and prolonged periods of heavy military recruitment and labour shortage. Despite this, real wage rates in London underwent a long-term decline.

This raises two related questions. First, to what extent was the nature of the metropolitan labour market responding to economic change? Secondly, how did the patterns of parish apprenticeship reflect such changes?

To answer this we shall be analysing data from the parish of St. Martin-in-the-Fields in Westminster, a parish with a population of c.42,000 in 1725 and 25,000 in 1801. We are currently recreating the life histories of those who encountered the poor relief system, particularly those who came into contact with the workhouse between 1725 and 1825. The paper will be based on some 3,160 girls and boys apprenticed from the workhouse between 1725 and 1824, but will also be supplemented by rich material contained in settlement examinations and parochial registers of pauper apprenticeships. Preliminary findings suggest some fluctuations in the ages at which parish apprenticeships were begun and quite strong swings in sex ratios. There is also some striking evidence of how parish apprentices were being sent from Westminster to the booming textile industries of Yorkshire and Lancashire in the later eighteenth century.

II/C Currency Regimes

Chair: **George Selgin** (Georgia)

Lars Boerner & Oliver Volckart (Humboldt, Berlin)

Currency unions, optimal currency areas and the integration of financial markets: Central Europe from the fourteenth to sixteenth centuries

In the present paper, the question of how important currency unions were for the integration of Central European financial markets between the fourteenth and the sixteenth centuries is examined. Research in economic history has up to now not discussed this subject in any detail. Some economic historians claim that monetary diversity severely impeded inter-regional or long distance trade, but most, even those who discuss integration issues, seem implicitly to assume that money was neutral. Some economists on the other hand, claim that trade within currency unions is considerably larger than what should be expected under conditions of monetary diversity. A special aspect of this question is the problem of what came first: the currency union or the integrated market. In other words: did currency unions form only where financial markets were well-integrated from the start, or did they cause the ex-post integration of markets?

Hitherto, the integration of European financial markets was analysed from a quantitative point of view only for the period from the late seventeenth century onward, the assumption being that the lack of suitable data prevents a similar analysis for the prior period. However, we use exchange rate data and data on the bullion content of late medieval and early modern currencies in order to establish local gold-silver ratios, and deviations between these ratios as indicators of a lack of integration of financial markets. In contrast to today, exchange rates for the same foreign currencies differed even between the members of currency unions, we can compare spreads within such unions to spreads between the members of a union and outsiders. This approach allows us to extend the analysis back into the fourteenth century.

We set up a database built on the analysis of primary sources, which consists of *c.* 3,000 observations of spreads between gold-silver ratios between 35 cities. Here, we leave exchange rates imposed by political authorities out of account, concentrating on those which originated on the market.

Based on a panel data analysis, on various endogeneity tests, and controlling for a number of additional influences such as transport costs and political conditions, we show that financial markets were significantly better integrated where the same currency was used than where conditions of monetary diversity prevailed. As for the question of whether currency unions were formed only where markets were well-integrated from the start, our analysis shows that this was clearly the case. Hence, the hypothesis advanced by economists who claim that modern currency unions cause the integration of markets needs to be qualified where late medieval and early modern unions are concerned.

Matthias Morys (Oxford)

The emergence of the Classical Gold Standard

This paper asks why the Classical Gold Standard (1870s – 1914) emerged: Why did the vast majority of countries tie their currencies to gold in the late nineteenth century, while there was only one country – the UK – on gold in 1850? The literature distinguishes six theories to explain why gold won over bimetallism and silver. We will show the potential and pitfalls of five of these theories (macroeconomic theory, ideological theory, political economy of choice between gold and silver, the gold standard as an ‘accident of history’ and the gold standard as an inevitable outcome of nineteenth century monetary history) and make our case for the sixth theory which we feel has been neglected in the recent literature, i.e. the microeconomic theory.

Most studies have focused on the choice of Germany and France in the early 1870s in explaining the emergence of the Classical Gold Standard. We argue that what really needs explaining is the 1860s, the decade before the global shift to gold (Germany 1871, France, Belgium,

Netherlands and the Scandinavian countries 1873, US 1879): Why do the 1860s, as evidenced by the protocols of the monetary commissions we study (International Monetary Conference 1867, German chambers of commerce meetings 1861, 1865 and 1868; France: various commissions in the 1860s; Italy 1862; Austria-Hungary 1867; Spain 1868; Greece 1868) witness a growing global sentiment in favour of gold?

Later in the nineteenth century, many countries adopted gold simply because the most mature economies of the day – the UK, the US, France, and Germany – were all on gold. In the 1860s, however, European countries still faced a tri-polar monetary system, with a tiny gold bloc led by England (only Portugal had already joined in 1854), a more sizeable bimetallic bloc led by France, and a silver bloc composed of the German states, the Netherlands, and the Scandinavian countries. As a result, in the 1860s the gold standard could not yet exert the magnetic influence it would later have. Similarly, in the 1860s both gold and silver promised monetary stability, as the gold-silver ratio had remained virtually unchanged since the early 1850s; silver was not yet seen as an ‘inflationary’ metal.

So why did European countries pronounce themselves in favour of gold at a time when both silver and bimetalism were still viable options? The protocols tell a story very different from how most economic historians have described the emergence of the Classical Gold Standard (Milward 1996; Flandreau 1996; de Cecco 1974). The monetary commissions show that the growing sentiment in favour of gold was motivated by the physical properties of the two metals: gold could encapsulate more value in the same volume than silver, and gold coinage was more accurate and less prone to wear and tear than silver coinage. In addition to the belief in the superior physical properties of gold over silver, there was also an unsubstantiated feeling that ever more countries would be joining gold in the medium and long term – i.e. some kind of self-fulfilling prophecy.

Thus, the emergence of the Classical Gold Standard was mainly motivated by microeconomic rather than, as most commonly assumed, macroeconomic considerations (cf. Bordo & Rockoff 1996, Meissner 2005). We argue that under nineteenth century monetary conditions these microeconomic factors mattered, and conferred an advantage to gold over silver which eventually led to a global monetary standard based uniquely on gold (cf. Redish 1990 and 1995).

From this perspective, what was special about the German decision in 1871 in favour of gold was not so much that it was a decision *in favour gold*. Most countries would have taken a similar decision in the early 1870s, but they were all held back by rather idiosyncratic circumstances. What was special was that Germany’s preference for gold was followed by deeds. Looking at the situation from this angle, it does not matter whether the silver supply shock of the 1870s was large enough to render bimetalism unworkable or not (Mertens 1944, Flandreau 1996, Oppers 1996). We argue that the emergence of the Classical Gold Standard was neither an *inevitable occurrence* nor an *accident of history*: it was *wanted*.

Dror Goldberg (Texas A&M)

Why did Massachusetts invent modern currency?

Modern currency has the following properties: It is issued by a government; it is intrinsically useless; it is not convertible into anything; it is generally not forced on transactions; and it is legal tender, so contractual debts and tax obligations can be discharged with it. This currency has dominated the world since the convertibility suspensions of the Great Depression, and had been temporarily created in numerous wartime suspensions beforehand.

The circumstances which led to the *first* creation of such currency turn out to be much more complicated than an emergency suspension. Facing a wartime emergency coupled with a constitutional emergency, the provisional revolutionary government of Massachusetts had to invent this type of currency in 1690. The peculiar political considerations of that inter-charter period led not only to the creation of this new type of currency, but also forced the issuing government to disguise it as something completely different – as a private-type credit instrument. The method of disguise indirectly determined the market discount on the notes.

In 1690 Massachusetts tried to occupy Quebec and counted on the expected loot to pay for the expenses. When the expedition failed the bankrupt colony had to pay the troops their wages. It had to resort to paper money, the value of which could be supported in various ways. The choice had to take into account the fact that the government was not a sovereign but a subject of the English king.

One obvious status that had to be given to the notes was their acceptance for tax payments. An issuer rejecting its own currency in payments made to it hardly inspires the public's trust in that currency. Moreover, the colonists saw with their commodity money the great boost that official tax acceptance gives to a currency's value. Before 1690, local producers of other currencies (coins and banknotes) had also asked for this privilege.

An even more obvious status, one that had been given to every previous paper money in history, was the promise of convertibility into specie or goods. But this was an empty promise. There was no hope of obtaining enough specie or goods any time soon. England would not help, loot proved unreliable, and taxpayers preferred to pay in paper.

Therefore, the act authorizing the issue, and the text on the notes, promised that the notes would be redeemed in goods or specie when possible and would be accepted for payments made to the Treasury. In that they were not different from a personal IOU, in which a person promises that the note will be redeemed and that it can be used to offset a debt owed to the issuer.

Formally, the government could not promise anything else. The reason was that it had been previously punished for issuing money, and in 1690 it could not afford to do it again. One of the main reasons for the loss of the original charter in 1684 was the local minting of legal tender coins, which violated the royal prerogative. From 1688 to 1691 the colonists lobbied for a revival of their old charter or for a new charter that would maintain their privileges. They faced considerable opposition. So when the paper money was issued in 1690 it had to look as no more than an IOU. Making it look like a sovereign-issued money would have ruined the chance of getting a good charter.

Even as an IOU this currency was limited. Unlike most American banking schemes and private and public debt instruments before and after 1690, the promise of convertibility did not refer to land. I attribute this deviation from normal practice to the land policy of the deposed royal governor. He invalidated all the land titles and declared all the land to belong to the king. Even though the king ex-post approved his removal from power, he was exonerated and his land policy not overruled until 1691. In 1690, promising the king's land for the colony's notes was risky.

Beyond the IOU appearance, the money actually was supported in another way. One act, ignored by historians, made grain legal tender for government debts, but with one third abated. This is relevant because it was a threat to the troops: If you reject the paper money, you might be forced to settle for a low quantity of grain instead. To some extent, this made the paper money legal tender for government debts: creditors rejecting it lost some of their claim.

The magnitude of the abatement – one third – was chosen to mimic the magnitude in traditional acts that discriminated against tax payments in grain. This made the act appear as something not out of the ordinary, thus misleading the king and historians alike.

The returning troops were hit by hunger, frost, and smallpox. They were desperate for payment and food. They had to choose whether to be paid in new paper money of questionable value or in grain with one third abated. Not surprisingly, the sellers, who had all the bargaining power, accepted the notes at a one third discount. This made the troops indifferent between accepting the paper money and getting paid in grain. After the troops spent the paper money the act that threatened paying them in grain was no longer relevant. As a result the market discount immediately disappeared.

To summarize, the weak inter-charter government had to make its currency look like an IOU but actually it functioned as an inconvertible legal tender. The deception was successful and paved the way for the new charter of 1691. Massachusetts then immediately fixed the anomaly and made the currency explicitly a full legal tender.

II/D Public Finance and Balance of Payments

Chair: **Roger Middleton** (Bristol)

Herman de Jong *et al.* (Groningen & Utrecht)

Ports, plagues and politics: the development of cities in Italy, 1300-1861

The evolution of city growth is usually studied for relatively short time periods. The rise and decline of cities is, however, a process that may take many decades or even centuries. In this paper we study the evolution of a large sample of Italian cities for the period 1300-1861. One might expect that city size distributions and also the ranking of individual cities in the distributions changes over time – growing cities that were once only of local importance overtake former important centres. This, however, is not the general conclusion from the literature. As illustrated in, for example, de Vries (1984) and Hohenberg (2004), the European system of cities seems remarkably stable: ‘Taking both the resistance and the resilience of cities together, it is perhaps not surprising that the European system should rest so heavily on places many centuries old, despite the enormous increase in the urban population and the transformation in urban economies.’ (Hohenberg, 2004, p.3051).

Theories regarding the existence and development of cities experienced a recent revival.¹ Davis and Weinstein (2002) mention three main approaches that can be distinguished in the modern literature: random growth theory, increasing returns to scale theories and finally, models that emphasize physical geography or other fixed endowments. Whatever the relevance of each of these theoretical approaches, a prerequisite for any testing of these modern urban theories is, however, the availability of well-documented, historical analyses of urban development.

The main contribution of this paper is twofold. First, and building on Malanima (1998, 2005), we use a large historical dataset on 400 Italian cities for the period 1300-1861. Italy is one of the first urbanized countries in early modern history. In sketching the development of urban hierarchies in Europe as early as 1250, Russell (1972) labelled Italy as ‘the most advanced and urbanized country in Europe and probably even in the world’. Also, Italian cities experienced many shocks with different characteristics through time. We use a wide array of descriptive statistics on individual city sizes and the city-size distribution as a whole to highlight the main characteristics of Italy’s urban system such as the differences between northern and southern Italy. We calculate for each city its ‘urban potential’, an indicator which measures the accessibility of a city to other cities. By giving an indication of the spatial interdependency we are able to reveal the developments within and among urban subsystems, like Florence, Milan and Venice in the North and Rome and Naples in the South.

The second contribution of this paper is the presentation of panel data estimates to provide a deeper understanding of the development of Italian cities for the period 1300-1861. Our data allow for a panel estimation where city-size is regressed on various geographical, political/institutional, and economic determinants of city size. To capture, for example, the effect of physical geography we constructed variables indicating the location of cities (in mountainous areas, or along navigable waterways or Roman roads). We show that, besides the two severe plague epidemics in the fourteenth and in the seventeenth century, the main determinants of Italy’s city growth invariably are physical geography and political predominance. Seaports and cities that have access to navigable waterways show significant faster growth. It suggests that transport over water is an important long term factor determining Italy’s city growth. Second, our estimation results indicate a positive effect of being a capital city on city size. The North-South divide turns out to be important here as well because the ‘capital bonus’ is much larger in the Kingdom of Naples and in the Papal States than in

¹ This is best illustrated by J.V. Henderson and J-F. Thisse (eds.), 2004, *Handbook of Regional and Urban Economics*, Vol.4: Cities and Geography. The contributions in this Handbook illustrate that in the past 15 years or so, new theories have come to the fore. In this respect the contribution of Krugman (1991) deserves to be mentioned. This paper initiated a whole new sub-discipline, the so-called New Economic Geography (NEG), that formalizes the most important agglomerating and spreading forces that are responsible for the spatial distribution of economic activity. The big step forward in this approach is that the spatial distribution of economic activity can be derived endogenously.

the North. Furthermore we provide tentative evidence regarding the relevance of economic variables. After 1700 we find that city growth is accompanied by declining real urban wages. We believe that Harris-Todaro-like elements may have been of influence, in the sense that a labour surplus was drawn from the rural areas, towards urban areas even when the odds of finding work were less than one.

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Masato Shizume (Kobe)

Sustainability of public debt: evidence from pre-World War II Japan

Throughout Japan's modern history, it defaulted on its public debts only once, after World War II (WWII). Japanese yen-denominated government debts became worthless during the rampant inflation between 1945 and 1948. How did Japan lose its ability to sustain its public debts? Although there are many narrative analyses of this question, there are few quantitative analyses. This paper explores the sustainability of public debts in Japan before and during WWII.

First, this paper conducts three stages of econometric analyses. It tests Ricardian neutrality of public debt. The test fails to reject non-neutrality. Then, it tests the dynamic efficiency of Japanese economy, and confirms it. These results indicate a need for another test for sustainability of public debt, one of which is proposed by Bohn (1998).²

Bohn's method tests the relationship between public debt and primary balance. Bohn's basic notion is that if a government improves its primary balance when it sees an increasing public-debt/output ratio, then its public debts are sustainable in the long-run. If not, public debts are not sustainable.

This paper conducts Bohn's tests with a new dataset of Japanese primary fiscal balance from 1885 to 1943. The tests assuming structural changes within the sample period indicate that Japanese public debts were sustainable until 1931, and unsustainable in and after 1932.

Second, this paper interprets the results of quantitative analyses with narrative modes of analysis.³ In doing so, it explores the governance of fiscal policy both from the domestic and the international sides. It compares the policy responses during two periods in which the Japanese government faced financial difficulties, namely after the Russo-Japanese War (1904-5) and in the 1930s. In both periods, the sustainability of government debts was in question. The government accumulated foreign and domestic debts during the Russo-Japanese War, and the government faced new needs for fiscal expenditures after the War. In the 1930s, Japan experienced capital flight when Britain departed from the Gold Standard. Following Britain, Japan departed from the Gold Standard, and initiated debt-financed fiscal spending in the midst of the Great Depression.

² Bohn, Henning (1998), 'The Behavior of U.S. Public Debt and Deficits,' *The Quarterly Journal of Economics*.

³ Smothers (2007) provides extensive narrative evidence on this issue. Richard J. Smethurst, *From Foot Soldier to Finance Minister: Takahashi Korekiyo, Japan's Keynes*, Harvard University Asia Center, 2007.

On the domestic side, policy institutions under the system of the Meiji Constitution of 1889 made governance of fiscal policy difficult. This was the case both after the Russo-Japanese War and in the 1930s. The cabinet's political power to coordinate among various political entities such as the Army, Navy, House of Lords, House of Representatives, Privy Council, and bureaucrats – entities directly and independently responsible to the Emperor – was limited. The cabinet had to make collective decisions under the rule of unanimity, and the Prime Minister did not have the authority to remove a member of the cabinet when the member disagreed with other members. In such a case, the entire cabinet had to resign.

These political institutions gave the military an effective veto in budgetary processes. The military had authority to create their own spending plan without consulting with other cabinet members or with the budgetary branch, and then to negotiate with the Ministry of Finance to finalize the annual budget. If the military disagreed with cuts in military spending, they could reject the budget at the cabinet meeting.

On the international side, financial constraints under the international Gold Standard enforced fiscal discipline after the Russo-Japanese War. This was not the case when the international Gold Standard was in trouble during the 1930s.

Joining the Gold Standard was a choice of policy regime. Under the Gold Standard regime, a country enjoys easy access to international financial markets when it needs to borrow large amounts of money, for example, during wartime. In return, the government sacrifices the needs of the domestic economy in order to maintain an external balance and gold parity in ordinary times. Sound fiscal policy was a prerequisite for joining the Gold Standard, and for joining the international community.

The late nineteenth and early twentieth centuries were the heyday of the international Gold Standard. Japan adhered to the principles of sound fiscal policy even before joining the Gold Standard, and joined it in 1897. Adherence to the Gold Standard enabled Japan to finance the Russo-Japanese War by borrowing money in Europe and North America. Japanese political players recognized the importance of the international financial markets for achieving national goals.

After the Russo-Japanese War, the Japanese policymakers, including the military, agreed to limit government spending within the range of maintaining gold parity. Japan turned to a tight fiscal policy when Japan's fiscal gap raised the question of the sustainability of its debts, and when the price of its debts fell in the international financial markets.

In the 1930s, the military did not agree to limit military spending within the limits necessary to maintain gold parity. The international Gold Standard was falling into chaos after the departure of Britain in September 1931. Japan could not expect easy access to the international financial markets, even if it adhered to the principles of the Gold Standard. Rather, the adherence to the Gold Standard worsened economic conditions. Japan departed from the Gold Standard in December 1931, following Britain, and initiated debt-financed fiscal spending.

During 1930s, political institutions lost fiscal discipline because of the military's effective veto over budgetary processes, and because of the absence of pressure for sound fiscal policy from international financial markets.

Fiscal policy was formulated in the political arena, not by a single entity. Japan was losing the ability to sustain its public debts because the budgetary process during the 1930s failed to restrict fiscal expenditures. In response, fiscal and monetary authorities introduced a new method for financing public debts, the underwriting of government bonds by the Bank of Japan. They were trying to prevent the collapse of the securities markets. In the absence of fiscal discipline, they were forced to depend on this method more and more.

Valerio Cerretano (Bozen/Bolzano)

The Bank of England, the Treasury and Britain's postwar industrial reconstruction: the 'Securities Trust', 1921-27

Increasing investment in industry, the acquisition of stakes in a broad array of industries, the devising of grandiose schemes of industrial reconstruction: this process of expansion into the field of

industrial finance constitutes an essential aspect of the history of the Bank of England in the interwar era and a central episode in Britain's industrial history. By the mid-1920s, the Bank invested in industry, on average, about 2 per cent of its total investment: a small figure relative to its total assets, and yet, a large amount of capital in relation to the size of British industry. Unable to alter its traditional functions and mandate, this investment made the Bank one of the largest industrial owners and a significant source of industrial finance in interwar Britain.

Not surprisingly, thus, it is in connection with the effects that this intervention had on British industry – rather than in relation to the historical evolution of central banking – that the theme of the Bank's intervention in industry has attracted growing attention in recent years. Following Chandler and Lazonick's lines of argument, whereby the ossification of British staple industries largely followed from industrial fragmentation, and the seminal works of Bamberg and Tolliday, the mainstream literature has placed particular emphasis on the inability of the Bank to use its large holdings as leverage to bring about concentration. The Bank's incursions in industry were designed to avoid any industrial commitment by the City, and to forestall public intervention in industry. These incursions were 'at most, reluctant pokes at the market mechanism' (Bowden and Collins, 135), driven by the 'pressure of circumstances' – namely unemployment, the poor performance of export industries and mounting public criticism – which was so great as to mark a shift in the Bank's perception of public responsibilities (Heim, Bowden and Collins, Garside and Greaves).

With its extensive sources (in the main primary material kept by the PRO and the Bank of England), this paper adds new material to this debate, but takes a different perspective. The aim here is not the evaluation of the Bank's attempts to further industrial concentration in the 1930s. Nor is the issue of British alleged industrial decline the underlying concern. The paper has the two-fold aim to shed new light on the ways in which the Treasury encouraged the Bank to get involved in industrial finance in the early 1920s, and to connect this debate with the broader discussions centring on the history of the Treasury and Britain's postwar reconstruction (Daunton, Burke, Peden, Booth, Kynaston). How important industrial matters were in the strategy of financial restoration of the Treasury, and how great the role of the Treasury was in the Bank's involvement in industry by the early 1920s, these are largely unresearched themes feeding into a variety of debates: the involvement of the government in industry during the war, postwar reconstruction and the factors behind the early involvement of the Bank in industry. This paper aims to fill this gap in the literature. One suggestion here is that the Bank acted as a Treasury agent in industrial affairs, and that its increasing involvement in industry partly resulted from the strategy of financial restoration that the Treasury pursued by the end of the First World War.

The paper examines the launch and operations of the 'Securities Trust' (ST). Jointly set up by the Bank and the Treasury in 1924, ST was a company holding the stakes which the government acquired during and soon after the war. ST stemmed from an agreement between the Bank and the Treasury, whereby the former undertook to manage and sell a number of holdings which could not rapidly be disposed of by the Disposal and Liquidation Commission, a body entrusted with the liquidation of war material. ST financed the reconstruction of the giant rayon-maker British Celanese and of a group of British-owned banks operating in Central and Eastern Europe (the Anglo-Austrian Bank, the British Trade Corporation, the London Merchant Bank and the Bank des Pays de l'Europe Centrale). By the late 1920s, ST had placed the bulk of its interests on the market. During the slump of the years 1929-32, ST received new equities from the Treasury (mainly those of armament firm Beardmore) which it sold in the late 1930s. ST was finally wound up in the early 1950s.

The history of ST suggests that the Bank took over government-owned holdings, securing long-term finance to them, in view of their disposal, and this, in an attempt to reduce public spending. The support of the Bank proved crucial to the postwar reconstruction – not at all a foregone conclusion in the early 1920s – and subsequent successful development of British Celanese. There was, however, no notion of 'strategic industry', as Tolliday suggested, or grand design at work behind this support. On the contrary, this was piecemeal, and was developed within the ambit of a strategy aimed at a rapid decontrol in industry. Moreover, the Bank's assistance was planned to be temporary. This assistance proved short-lived – and ST proved successful – on account of the nature

of the interests held by ST and certain characteristics of the British capital market in the 1920s which allowed their swift disposal. There are here some insights into the rationale behind the 'Securities Management Trust' – the industrial arm of the Bank by 1930 – of which ST was, to some extent, a forerunner. Lastly, the history of ST testifies to the growing weight that industrial matters had in the postwar reconstruction strategy of the Treasury and in the forging of the Treasury-Bank relationship. It has been emphasized that the war altered relations between the Treasury and the Bank, marking a shift in power towards the former in monetary policy (Kynaston). The history of ST suggests that this shift took also place in the ambit of industrial policy.

The paper begins by estimating the Bank's industrial investment in the years 1923-39, and by examining the various channels leading the Bank towards intervention. It then considers the Treasury's postwar strategy of reconstruction and the launch and operation of ST. It concludes with some speculations about the effects of postwar deflation on the Bank's industrial intervention.

II/E Control in the Dictatorships

Chair: **Germà Bel** (Barcelona)

Oxana Klimkova (Central European, Budapest)

Corruption in the GULAG: the case of the White-Sea Baltic combine and the camp of the NKVD

The paper is devoted to the exploration of corruption and economic crimes within the GULAG, the system of Soviet forced labour camps, on an example of the economic crimes that were disclosed in the White Sea Baltic Combine and the Camp NKVD (BBK). Throughout the 1930s its bosses complained of a high level of corruption and embezzlements in the administrative apparatuses and economic enterprises.

The paper, based on criminal cases investigated by the Third (Operative) Department of BBK, attempts to study 'shadow economy' networks, their participants, and the ways the Chekists tried to eliminate corruption. Although usually in the 1930s the disclosure of embezzlements did not result in the death penalty, during the 'Great Terror' (commonly known as a range of repressive operations targeting certain social groups in the Soviet Union in the year 1937-1938, also referred to as 'Ezhovschina' or 'Stalinskie Repressii.' ('Stalin's purges')) the crimes of theft and embezzlement were included in the category resulting in capital punishment under operative order No. 00447.

Finally, the paper undertakes an analysis of the logic of these investigation processes. Individuals, accused of embezzlement within the BBK NKVD, and persecuted in 1937-1938, included hired staff (often ex-prisoners) and prisoners employed in the camp administrative and financial apparatuses. Many of them were registered as 'state employees' (*sluzaschie*) prior to their arrest and detention in the camp. As a rule, criminal cases were based on reports compiled by the inspectors' commissions of the BBK. Despite the fact that the 'shadow' economy was thriving in the camp subsections, such reports in a large part were based on surmises and guess-work, forged evidence and denunciations. For example, financial losses included an arbitrarily calculated sum of 'uncollected profits', that had allegedly occurred as a result of failure to fulfil the economic plan, or from 'inappropriate use of the cattle'.

Germà Bel (Barcelona)

Against the mainstream: Nazi privatization in 1930s Germany

Privatization of large parts of the public sector has been one of the defining policies of the last quarter of the twentieth century. Some economic analyses of privatization identify partial sales of state-owned firms implemented in Adenauer's Germany in the late 1950s and early 1960s as the first large-scale privatization programme,¹ and others argue that, although confined to just one sector, the denationalization of steel and coal in the United Kingdom during the early 1950s should be considered the first privatization.²

None of the contemporary economic analyses of privatization takes into account an important, earlier case: the privatization policy implemented by the National Socialist (Nazi) Party in Germany. The modern literature on privatization, the recent literature on the twentieth-century German economy and the history of Germany's publicly owned enterprises all ignore this early privatization experience. Some authors occasionally mention the re-privatization of banks but make no further comment or analysis.³ Other works⁴ mention the sale of state ownership in Nazi Germany only to support the idea that the Nazi government opposed widespread state ownership of firms and do not carry out any analysis of these privatizations.

It is a fact that the government of the National Socialist Party sold off public ownership in several state-owned firms in the mid-1930s. These firms belonged to a wide range of sectors: steel,

¹ Megginson, *Financial economics*, p.15.

² Burk, *First privatization*; Megginson and Netter, 'History and methods of privatization', p.31.

³ Barkai, *Nazi economics*, p.216; James, 'Deutsche Bank and the dictatorship', p.291.

⁴ Hardach, *Political economy of Germany*, p.66; Buchheim and Scherner, 'The role of private property', p.406.

mining, banking, local public utilities, shipyard, ship-lines, railways, etc. In addition, delivery of some public services produced by public administrations prior to the 1930s, especially social services and labour-related services, was transferred to the private sector, mainly to several organizations within the Nazi Party. In the 1930s and 1940s, many academic analyses of the Nazi economic policy⁵ discussed the privatization policies in Germany.

Most of the enterprises transferred to the private sector at the Federal level had come into public hands in response to the economic consequences of the Great Depression. Many scholars have pointed out that the Great Depression spurred state ownership in Western capitalist countries, and Germany was no exception. But Germany was alone in developing a policy of privatization in the 1930s. Therefore a central question remains: Why did the Nazi regime depart from the mainstream policies regarding State ownership of firms? Why did Germany's government transfer firms and public functions to the private sector while the other Western countries did not?

With the analysis of privatization in Nazi Germany this paper seeks to fill a gap in the economic literature. On one hand, I extensively document the course of privatization in the period from the Nazi take-over of government until 1937. These limits are sensible because all the relevant reprivatization operations had been concluded before the end of 1937. Some of the privatization operations explained in this paper have not been previously noticed in the literature.

On the other hand, I analyse the objectives of Nazi privatization. Ideological motivations do not explain privatization. However, political motivations were important. The Nazi government may have used privatization as a tool to improve its relationship with big industrialists and to increase support among this group for its policies. Privatization was also likely used to foster more widespread political support for the Nazi party. Finally, financial motivations played a critical role in Nazi privatization.

Nazi economic policy in the mid-1930s was against the mainstream in several dimensions. The huge increase in public expenditure programmes was unique, as was the increase in the armament programmes, and together they heavily constrained the budget. Exceptional policies were put in place to finance this exceptional expenditure, and privatization was just one among them. Nazi Germany privatized systematically, and was the only country to do so at the time. This drove Nazi policy against the mainstream, which flowed against privatization of state ownership or public services until the last quarter of the twentieth century.

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⁵ Poole, *German financial policies*; Guillebaud, *Economic recovery*; Stolper, *German Economy*; Sweezy, *Structure*; Merlin, 'Trends in German economic'; Neumann, *Behemoth*; Nathan, *Nazi economic system*; Schweitzer, 'Big business'; Lurie, *Private investment*.

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Andrei Markevich (Warwick)

The dictator's dilemma: to punish or to assist? Control Party Commission under Stalin

In a command economy the dictator's problem is how to enforce his decisions and preferences. The dictator issues orders (plans) and allocates resources to his agents via hierarchical channels. The dictator knows that his orders may fail to be carried out either because agents behave opportunistically or because his orders contain mistakes. The dictator is completely informed about which of his orders are implemented or fail, but not about the reasons for this. Incomplete information creates the dictator's dilemma: whether to punish or to assist an agent that has not fulfilled an order or acted poorly. The paper analyses the solution of this dilemma in the Stalinist command economy, using the records of the Party Control Commission (KPK) in the former Soviet party archives. The paper shows that the dictator's choices over punishment and assistance were strategic, not random. It depended on the costs of punishment and assistance, the information on the agent's loyalty at the dictator's disposal and priority of orders. In general punishment and assistance were related inversely, but the levels of punishment and assistance were both increasing in the priority of orders. Threat and 'operative assistance' were supplementary techniques that the dictator used to reduce the costs of punishment and assistance, but in the long run these also led the dictator to mix punishment-assistance strategies.

II/F Postwar Economic Policy

Chair: **Catherine Schenk** (Glasgow)

Jim Tomlinson (Dundee)

Balanced accounts? Constructing the balance of payments 'problem' in postwar Britain

This paper argues that we should be highly skeptical about the common arguments that treat Britain's balance of payments problems in the 'golden age' of the 1950s and 1960s as signs of economic inefficiency and 'decline'. In these years Britain normally ran a current account surplus, using this position to rebuild an enormous portfolio of foreign assets. Within the current account, the surplus on manufacturing trade was substantial, and much larger than in 1938 relative to GDP. Private sector services were weaker than before the war, but relative to GDP recovered by the late 1960s. Overall, Britain's trade showed a great ability to restructure itself in terms of both commodities and markets, offsetting the huge damage from the war.

The payments problem, this paper argues, was not the internationally competing goods and services sectors, but government spending, coupled to net overseas investment. The argument here is not about whether the policies that caused the payments problem were good or bad. The point is that the problem was of a different kind to that commonly represented by government at the time, and commonly presented by subsequent commentators. On contemporary representations of balance of payments issues, the argument is not that governments were dishonest in how they told the story of the balance of payments, rather that they found it much easier to link payments issues to domestic economic efficiency and competitiveness than to the 'high strategy' of overseas investment and military spending. In turn, this linkage appealed because it fitted with pre-existing discourses about the economy, which became embedded in the postwar policy debate. These debates focused upon the desirability of faster growth to be delivered by higher efficiency allied to wage restraint. From the late 1950s this took a new turn as 'decline' was diagnosed and rapidly became accepted as an underpinning assumption of most economic argument. In this environment it was only too easy to link the payments problems to this notion of 'decline'. Most subsequent commentators have simply followed suit, testimony to the power of the declinist mindset that has dominated so much economic debate.

In sum, the very partial representation of the payments problem which predominated in contemporary debate, and which has so influenced what has been said since, built upon but also in turn reinforced the 'culture of decline', which is the problem that all accounts of Britain's postwar economic policies and debates need to put centre stage.

Glen O'Hara (Oxford Brookes)

Numbers, experts and ideas: international organizations, international surveys and perceptions of the outside world in Britain, c.1950-70

This paper will attempt to build up a picture of Britons' varying responses to foreign policy examples during the 'golden age' of economic growth experienced in the 1950s and 1960s. Britons had long been used to hearing about their neighbours' altruistic and effective economic and social policies. But they lost confidence in the British 'model' during the late 1950s and early 1960s, they turned with even greater alacrity to those countries for ideas about governing the welfare state. Ideas about other countries were not nebulous, diffuse or without consequence. It also outlines the process by which these foreign exemplars fell from grace, as their own problems and paradoxes became increasingly apparent. Given that renewed enthusiasm, this paper will further attempt to analyse the reasons why some policies adopted from continental and American examples were more influential, and more successful in the British context, than others.

The author will explore the idea of 'imaginative geography' to show how policymakers' and commentators' views often reflected their own biases and outlook, rather than the actual structure and performance of Europe's economies. To do this, it will use examples from macroeconomic policy, prices and incomes planning, as well as educational, regional and government procurement

policies. Foreign examples also formed a crucial component in reform of training policy, science expenditure, and administrative law: this paper shows exactly how and why their influence was felt. The particularly fashionable examples of the time show how decision-makers, both consciously and unconsciously, sought out cases that fitted their own ideology and predispositions.

Politicians, officials and academics were particularly influenced in this respect by international surveys and reports, published by institutions as varied as the International Labour Organisation, the World Health Organisation, and ‘thinktanks’ such as the Brookings Institution in Washington DC. One especially impressive feature of such work was thought to be the assembly of comparative data: on labour productivity, educational attainment and performance, or on wages and prices. The paper will buttress its analysis of the influence of international examples with an assessment of how important these numbers were in that process. It will therefore reflect on how and why some policy areas were most affected by preconceptions, and others relied on the perceived efficacy of numbers as opposed to ideological predispositions or qualitative decision making. This will follow on from work recently published in the *Economic History Review*, entitled ‘Towards a New Bradshaw? Economic Statistics and the British State in the 1950s and 1960s’.

Michael J Oliver (Ecole Supérieure de Commerce de Rennes) & **Hugh Pemberton** (Bristol)
UK economic policy in the 1960s and 1970s and the challenge to learning

Between the early-1960s and the mid-1970s British governments made extensive changes to the framework of British economic policy, both internal and external. Many of these policy changes, some of them quite fundamental, which were made in these years no longer resonate; instead, the late-1970s is generally seen as the period in which everything changed in economic policy. It is our contention, however, that between 1961 and 1976 the major changes that took place in British economic policy had the *potential* to be as fundamental and as long lasting, and thus as significant, as those that took place in the years that followed. These changes encompassed both the domestic and external dimensions of the United Kingdom’s economic policy and, unusually, were often characterized by alterations not just to policy instruments and policy settings but by changes to the very goals of policy. For example, the early- to mid-1960s saw a concerted attempt, first by the Conservative government and then by its Labour successor, to shift Britain towards a system of tripartite economic planning in the domestic policy arena. In the process, governments amended and recalibrated domestic policy goals, with the introduction of targets for economic growth, and with higher growth itself, made the primary goal of economic policy. Alternatively, in the realm of international financial policy, one might point to floating of the pound in 1972 or, more fundamental, the withdrawal of foreign official sterling balances in 1977 and thus the downgrading, perhaps even effective ending, of sterling’s reserve currency role. Both in the domestic and in the external policy arenas therefore changes took place that involved substantial changes both to the instruments of policy and to policy goals.

Drawing from relevant theoretical work in political science, this paper will examine the policy changes that occurred in the 1960s and early-1970s in both domestic and external economic policy and will consider why those changes, despite their potential for fundamental change, proved to be less significant than their architects hoped. We will ask whether any part in the failure of those policy changes to fulfil their potential was played by discrepancies between the respective internal and external policy agendas.

Jeroen Touwen (Leiden)

Paradigmatic changes in the Netherlands, Sweden and New Zealand: from Keynesianism to the market, 1975-90

The worldwide shift in the early 1980s from Keynesian, demand-oriented economic policy to monetarist and supply-side policy has been studied widely by political scientists and economists. Historians only recently started taking this period as a subject of study, but they can offer a view that is based on a more factual reconstruction of processes in the political economy.

The transition at hand was so important that many observers agree that a 'paradigm change' took place. Political scientists often apply the term 'regime change', but this emphasizes the change in political ideology and the political make-up of governments. Regime changes did play a large role in the departure from specific aspects of economic policy (such as government regulation or extensive job creation in the public sector), but in many countries regime change was accompanied by a more widely supported change in dominant policy view, due to the urgency to develop a new economic approach, and a concomitant realignment of unions and employers' organizations in setting economic priorities. In this contribution I compare the developments in the 1970s and 1980s in the Netherlands, Sweden, and New Zealand (reflecting on developments in the United Kingdom on the side). In all three countries the transition was radical and the policy debate intense.

Distant New Zealand experienced an accumulation of problems in 1984, including high inflation, a large current account deficit, a large government deficit, high unemployment and severe exchange rate problems. This led to a drastic policy change, remarkably under a socialist government, directed towards deregulation. It included tariff reductions, a floating exchange rate, privatization of state-owned enterprises, and restrictive monetary policy. The process shows remarkable parallels with 'Thatcherite'-type reform in the United Kingdom, but appears to have been relatively swift and unanimous, and carefully executed.

In the Netherlands, the consensus model was more explicitly present and mitigated radical reform. Tri-partite and bi-partite concertation had been institutionalized on various levels for several decades. Economic recovery started in the mid-1980s, partly as the result of broadly discussed policy changes since 1982. Although the process of reducing government deficit and government debt was slow, unemployment was battled successfully, serious economic crisis was avoided, and the approach to welfare state reform can be described as careful rather than radical.

Finally, in Sweden the process seems to have been more protracted due to the previous success of the Swedish model and the ideological commitment of the social-democratic party. Credit-based spending, repeated devaluations of the Swedish Krona, and a stubborn commitment to public sector employment seemed only to fight the symptoms of recession. However, in the meantime, several reforms were implemented. During the 1980s financial deregulation took place and the tax system was adapted to better withstand international competition. Although Sweden suffered from a severe financial crisis in the early 1990s, the Swedish model (often declared 'dead'!) still survives as social provisions remain in place next to a competitive, technologically advanced private sector.

The comparison shows that gradual economic reform may be less impressive, but allows countries to keep in place treasured elements of the welfare state (such as social consensus or specific public sector provisions). The ideological aspects of the political debate, often suggesting that neoliberal policies are vital to survive in a globalizing economy, seem to deny or underestimate the flexibility of the European social model: extended policy learning requires time but improves outcomes.

III/A Women in Medieval Courts

Chair: **Richard Smith** (Cambridge)

Christopher Briggs (Cambridge)

Women, debt, and the law of manor courts to 1350

This paper arises from a three-year research project funded by the AHRC entitled ‘Private Law and Medieval Village Society: Personal Actions in Manor Courts, c.1250-c.1350’. The aim of this collaborative project, which also involves Richard Smith (Cambridge) and Phillipp Schofield (Aberystwyth), is to reconstruct the characteristics of the litigation in personal actions (debt, trespass and broken agreements) conducted in manor courts between 1250 and 1350. Its contribution to economic history is to broaden understanding of the legal context in which rural commerce took place. The project’s key output is an edition of court roll texts with an interpretative introduction entitled *Select Debt Cases in Manor Courts 1250-1350*. My paper is based on the section of the introduction which uses examples from our database of unpublished court roll entries to consider how the law of debt in manor courts worked for women. It asks what our cases reveal about the understanding of the doctrine of coverture, or the subordinate legal status of married women, at village level. In particular, it asks whether the laws and practices of manor courts could have generated doubts about the ability of married women to contract independently, which in turn shaped and limited their participation in the local economy.

Matthew Stevens (IHR, London)

Small town women and the great famine of 1315-22

This paper examines the position of women in the borough of Ruthin, North Wales, during the Great Famine of 1315-22. It works to shed light on some of the common experiences of women throughout the approximately 800 strong network of small urban centres which populated the countryside of fourteenth century England and Wales prior to the Black Death of 1348-9.¹ To date, research concerning the experiences of working women in later medieval England and Wales has focused overwhelmingly on major urban centres in the years after the Black Death, seeking to identify and understand perceived pre- to post-plague changes to the socioeconomic position of urban women.² Explored here is the degree to which these ‘changes’ typically associated with a plague induced demographic decline of 30 per cent or more, such as increased urban migration by women, greater female craft/trade participation, and a delayed marriage regime, were truly unique to what has been dubbed a ‘golden age’ of opportunity for women in the century succeeding the 1348-9 epidemic.³ Hence, the fortunes of women working in skilled and unskilled areas of Ruthin’s pre-plague economy, such as brewing, baking, cloth-work, and domestic service are considered in the context of the famine period conditions of 1315-22. The capacity of these women to cope with or even take advantage of pre-plague diversity is gauged against our current understanding of female adaptability in the post-plague economy and parallels are identified. Lastly, complementary evidence concerning the capacity of Ruthin’s women to acquire and/or accumulate land, and their relative susceptibility to crime (i.e. rape and abduction) is utilized to help flesh out our understanding of female status in a pre-plague town.

This paper concludes that some activities of working women traditionally thought to have been made possible by post-plague demographic decline (and subsequently altered social norms) may already have been engaged in by pre-plague urban women. It is found that crisis conditions caused by the Great Famine of 1315-22 allowed Ruthin’s women to take advantage of some specific

¹ Griffiths has suggested that about 100 towns and chartered boroughs existed in early fourteenth century Wales, whilst Dyer has put the number for England at around 700. R. Griffiths, ‘Wales and the Marches’ in D. Palliser, ed., *Cambridge Urban History of Britain Vol.1, c.600 – c.1540* (Cambridge 2000), p.681; C. Dyer, ‘How Urban was Medieval England?’, *History Today* 47 (1997) pp.34-5.

² Prominently, P.J.P. Goldberg, *Women Work and Life Cycle in a Medieval Economy*, (Oxford, 1992).

³ C. Barron, ‘The ‘Golden Age’ of Women in Medieval London’, *Reading Medieval Studies* XV (1989).

labour shortages and possibly delay marriage in favour of employment, particularly within the baking trade. Famine conditions likewise inclined other groups, such as Ruthin's more wealthy brewers, to work together to better monopolize their micro-industry. Further, it is also tentatively concluded that the economic hardships of 1315-22 may have begun to undermine existing patterns of small-scale property accumulation by young women, inclining them towards urban migration and encouraging criminal exploitation.

Erin McGibbon Smith (Edinburgh)

Female involvement in crime and misbehaviour in the manor court of Sutton-in-the-Isle, 1308-91

This paper stems from a section of my PhD thesis, entitled *Reflections of reality in the manor court: Sutton-in-the-Isle, 1308-91*. It will begin with a brief discussion of the methodology used in the study, which was based on the manorial court rolls of Sutton, Cambridgeshire. It will then focus on the court roll evidence regarding crime and misbehaviour, with particular emphasis on female involvement.

In terms of method, the study considered the Sutton court rolls over a hundred year period, focusing on four periods when the records were particularly full, namely 1308-19, 1335-45, 1356-61, and 1377-91. The business of the court was extremely broad, with nearly 200 different activities recorded in the rolls during the periods under study. Each of these activities was categorized into one of seven key indices, namely: 'the lord's rights', 'inter-peasant litigation', 'community nuisance', 'officials and court function', 'crime and misbehaviour', 'land', and 'the market'.

Having outlined this framework, the paper will focus on 'crime and misbehaviour', which encompasses offences that were socially harmful, disruptive, or outright criminal. The most interesting element about this category is the degree of change over time in the four periods studied. In particular, there was a significant increase in reported crime during the post-famine, pre-plague period of 1335-45. This peak is particularly striking both because it casts doubt on Ambrose Raftis's widely accepted argument that a decline in the 'village community' took place after the onset of the Black Death, and because it involved a significant increase in the proportion of crimes committed by women, including assault, bloodshed, housebreaking, defamation, raising the hue and cry unjustly, and having the hue and cry raised against them (justly). For the majority of these offences this represented a peak of female involvement, and there was a subsequent decline in the last half of the century.

The overall rise in crime and the female element of it will be examined both in the wider context of the Sutton rolls and in the historiography of the period. While it remains unclear whether the increase in reported female crime was caused by a real rise in offences or a decline in toleration, the paper will offer the hypothesis that it may not reflect 'reality'. There is some internal evidence in the Sutton rolls that suggests that there may have been an increased concentration on crime and misbehaviour by the jurors in this period as a result of a decrease in the recording of activities relating to the lord's rights, which was a feature peculiar to this period. In conclusion, the paper will present the possibility that when crime and misbehaviour are less tolerated in the community in general, female crime is more likely to be reported in the court.

III/B Eighteenth Century Risk Management

Chair: **Katrina Honeyman** (Leeds)

Helen Paul (Southampton)

Risks and overseas trade: the way in which risks were perceived and managed in the early modern period

This paper considers the ways in which some investors in the early modern markets viewed the riskiness of the great trading projects launched *c.* 1700. The focus will be on the trading and financial nexus of the Georgian state, the Royal Navy and the two joint-stock companies which were engaged in the Asiento trade, namely the Royal African and South Sea Companies. However, the Darien scheme will also be used as a counterpoint to this case study.

The South Sea Company's slaving activities have been blamed for increasing international tensions and precipitating war. Its trade and its financial activities have been considered by the traditional literature to be so risky that anyone investing in the company must have been behaving irrationally. A revisionist financial history literature has attempted to overturn some of the myths surrounding the South Sea Bubble of 1720. However, the wisdom of investing in any company is proved only with hindsight. The way in which investors were made aware of the riskiness of the company's trade and the economic environment, and the conceptual models which were available to them to evaluate these risks were very different to our own sources of information in the modern markets. An earlier company, the so-called Darien Company of Scotland, attracted investors without informing them of the ultimate destination of the first company voyages. Such histories initially appear to confirm the notion that our predecessors were simply irrational. However, this creates a puzzle as the schemes were developed at times when the English stock market at least was undergoing a series of changes which have been conveniently termed the Financial Revolution. Many of these innovations are the foundation for the workings of modern economies. Perhaps the key to the puzzle is to recall that the innovations were occurring as part of a fiscal-military state and that the joint-stock companies were quasi-public organizations. Such hybrids of public and private enterprises had a different way of dealing with risk than purely private trading concerns. Firstly, they could share their risks with various parts of the state apparatus, such as the Royal Navy. Secondly, they acted to keep state options open regarding long-term strategy. The state would risk losing ground to its competitors if it did not support such joint-stock concerns. Early modern investors would have to consider these factors in determining the riskiness of private investment in the companies and also reassess the situation when the state's policies started to change.

Early modern investors also had more recent experiences of regime change than modern investors in developed countries. England had experienced the Civil War, the Restoration, the Glorious Revolution and the Hanoverian Succession. Scotland lost its own Parliament. Political patronage and religious and national affiliation were key factors in determining access to an economy's resources or even retaining certain legal rights. Therefore, a regime change could have a downside risk which was close to infinity. Supporting joint-stock companies, like the Darien scheme, might be seen a less risky option than allowing the dissolution of the country's existing regime. This would be analogous with war bonds. Other reasons posited were folly, desperation and blind patriotism. The actual location of the colony was unknown to even the first colonists until after they had set sail. It is argued that religious faith also has a strong role to play in the scheme. Religious faith is seen as a credible reason for successful expeditions, such as the Pilgrim Fathers. However, its role has been left out of unsuccessful ones such as Darien. There is evidence that the Scots believed that they were not merely defending Scotland's economy against English restrictions, but that they were promoting the Protestant cause. They, not unreasonably, expected William of Orange's assistance. He was their king and a defender of the Protestant faith. Modern economic models may stress rationality over faith, but the Darien investors were acting according to their deeply held beliefs. This may not be so far from the behavioural finance school as it first appears. Additionally,

religious faith is not absent from many modern day people's lives and even influences the actions of governments.

Only twenty or so years after Darien, investors were caught up in the South Sea Bubble. Like the Darien Company, the South Sea Company has been written off as an example of foolish investors and fraudsters. If the Darien Company was supposed to be an inevitable failure as it did not have William's support, then at the least the South Sea Company could provide various signs of political patronage. After the bubble burst, the South Sea Directors were accused of fraud and their estates confiscated. From the records of these confiscations, it can be seen that some invested heavily in land. This would be irrational for those who expected to make money through a scam which had a finite time horizon. They would wish to keep most of their assets liquid in order to flee the country easily.

The ways in which investors attempted to forecast an uncertain future were varied. Some were based on views of the world which do not conform to those held by secular, rationalist, individualist Economic Man. However, they were suitable to their own context and similar views are held now. In the case of the Darien colonists and the South Sea Directors, they invested not only money but their own futures. The colonists may have had the consolation of faith. The Company Directors' choices to buy land make their involvement in a fraud or scam more difficult to explain, except by separating their bribery from the over-enthusiasm of the stock market for their shares. Early modern investors seem to have operated with their own form of bounded rationality.

Natasha Glaisyer (York)

'Lost, burnt or otherwise destroyed': who bought eighteenth-century lottery tickets?

State lotteries were an almost continual feature of British life from the last years of the seventeenth century to the first quarter of the nineteenth century. They were both a central element of the fiscal military state, and thus an important source of revenue (in fact many lotteries were very closely connected to state loans), and also a popular spectacle that stimulated many other businesses. More than other forms of investment in the long eighteenth century the state lotteries presented an opportunity for a large and diverse number of minor players to make an investment, to take a gamble.

Eighteenth-century writings, for pleasure and profit, imagined that those who purchased lottery tickets came from across the social spectrum: from poor servants whose futures might be dramatically reshaped by either repeated loss or a substantial win, to wealthy merchants who were expected to give prize money away. Anecdotal evidence exists in diaries and letters about the purchasers of lottery tickets, and newspapers often reported the winners of the big prizes; such sources suggest that lottery tickets, or shares of tickets, were bought by those of modest means as well as those with more substantial fortunes.

This paper sets out to look at one particular type of source – the records of lost state lottery tickets – to attempt to build up a broader picture of the participants in the eighteenth-century British state lottery. Owners of tickets who had mislaid or accidentally destroyed their ticket could, under certain conditions, be issued with a replacement and so be eligible to claim a prize. Although it would be difficult to maintain that these records provide a representative sample of all those who purchased lottery tickets, they do allow a methodical analysis of the sex, location and occupation of lottery ticket owners to be undertaken. These ticket holders came from all over Britain (as well as overseas), were both men and women, and sometimes clubbed together to buy tickets.

These records often include the story of how the ticket was purchased. These stories reveal that tickets were often bought through an intricate web of agents, suggesting, as scholars are finding with other types of investment in the eighteenth century, that ledgers and other sources can hide the identity of certain types of investors, and that we need to think more broadly about the types of people keen to be involved in the British fiscal military state.

Some of the records of lost tickets also reveal how the tickets were lost; there are stories of tickets being thrown in the fire because the owner believed they had been 'drawn a blank', being pulled from a pocket and lost in the snow, or simply being 'lost in the post' or unable to be found!

Anne Laurence (Open)

Portfolio management and risk at the time of the South Sea Bubble: the case of Hoare's Bank customers

It is apparent that investment risk was well understood in the days when shipping was the major vehicle for investment, but it is less clear how well this was understood with the entry of many new and inexperienced investors into the stock market during the 1720s. It is, however, difficult to estimate attitudes without some knowledge of portfolio management and few records provide evidence of investors' activity over a period of years.

The customer ledgers of Hoare's Bank do provide a considerable amount of evidence about individual customers' purchases and sales of securities. This material cannot provide a definitive account insofar as customers may well have engaged in stock market activity which did not involve that bank. Nevertheless, it is possible to go some way to reconstruct the portfolios of individual customers and to look at their behaviour over a period of years.

Based on close analysis of the investments of customers of Hoare's Bank, this paper looks at how customers of the bank managed their portfolios at the time of the South Sea Bubble. Preliminary work has already shown that a considerable number of customers before 1720 put large amounts of money into lottery tickets, treating the lottery as a 'safe' repository for their money. From 1720 on, there was a wholesale move away from the lottery and into the South Sea Company which was sustained after the Bubble had burst.

This, combined with the relatively low value of investments in the East India Company and in Bank of England stock, raises questions about perceptions of risk in relation to diversification and types of financial vehicle (stock, bonds, annuities). Given the evident preference of the bank's customers for South Sea Company stock over all other forms of stock, did they spread risk by having assets in other forms such as government debt (navy bonds, exchequer bonds etc) or land? I hope, in this paper, to show how risk was spread in an attempt to understand the attitudes of this particular group of investors and to see whether there were differences between individual groups of investors (men/women/aristocrats/merchants etc.).

III/C Consumers

Chair: **Tony Wrigley** (Cambridge)

Julie Marfany (Cambridge)

Consumer revolution or industrious revolution? Consumption patterns in eighteenth-century Catalonia

Catalonia was unique among southern European regions in industrializing early and in a manner comparable to that of many parts of northern Europe, including England. The role played by consumer demand in this process from the eighteenth century onwards, however, has only recently begun to be investigated. Likewise, little is known about the impact of industrialization on living standards. This paper takes these questions as a starting-point for examining changes in consumption patterns over the long eighteenth century in one Catalan proto-industrial community, Igualada. This community was a market town in central Catalonia which expanded rapidly over the eighteenth century to become the leading manufacturer of woollen cloths by the 1760s and, after cotton began to replace wool in the 1780s, the second centre for spinning cotton and the fourth for weaving by 1820. At the same time, the town's population grew rapidly, from around 1,700 inhabitants in 1717 to 4,900 in 1787 and 7,700 in 1830. Most of this growth was driven by the expansion of the textile sector, which accounted for 28 per cent of male household heads by 1765. A family reconstitution has shown that mean age at marriage fell during this period, from a high of 25.5 to 22.5 years for men, and from 23.2 to 21 years for women, with the lowest ages being reached by those in the textile sector. The evidence of marriage contracts suggests that marriage was increasingly disassociated from the transmission of property. It is not clear yet, however, whether we are witnessing a process whereby proto-industrialization and other changes in the economy were providing new earning opportunities and thus improved income for couples, or a process of proletarianization, whereby couples were prepared to marry with fewer resources at their disposal. A related question is whether this community was experiencing an 'industrious revolution', whereby households were increasingly shifting their production and consumption towards greater involvement with the market.

This paper therefore attempts to answer some of these questions. A sample of some 490 inventories *post mortem* will be used to pinpoint the arrival of new products, such as tobacco, drinking chocolate and cotton textiles. The paper will also look at ownership of luxury goods such as paintings, books, clocks, gold and silver. Ownership of different types of goods will be measured according to occupation to assess how far down the social scale changes in consumption penetrated. The paper will also examine ownership of other kinds of property, such as land, houses, livestock and tools, to see if any changes in the material resources of households can be detected over this period. In particular, the inventories will be examined for signs of increased specialization and market orientation of production, both of which could be regarded as evidence of an 'industrious revolution'.

Joanne Bailey (Oxford Brookes) & **Angela McShane-Jones** (V&A)

The bed as an icon of early modern household

The household has been the subject of considerable scholarly interest and debate over the last half century, with research into its size and structure, the composition of its members and their emotional relationships, and more recently its role as a site of gender tensions. The material life of the household has also come under scrutiny, thanks to the burgeoning field of 'material studies', which has greatly extended our understanding of the importance of objects as they were produced, marketed, consumed and possessed. In the process, the sources used by economic and social historians and literary scholars have ranged beyond testamentary material to include court records, business and trade archives, advertisements from newspapers and trade cards, and literary sources. Disciplinary approaches are as varied, borrowed from anthropology, archaeology and psychology to name but a few. Collectively, this work has afforded unparalleled access to knowledge about the

interactions of household members, and the ownership, gendering and emotional significance of possessions in early modern households.

Although both rooted in the early modern household, these historiographies rarely interact. We propose that it is possible to draw them into a dialogue by analysing the household's three-dimensional objects, and the material experiences they embody; a conceptual framework that is rarely deployed in current scholarship. This paper thus offers an investigation into the possibilities of objects as archive, alongside the extended canon of sources, by focusing on one essential household object – the bed.

Historians of consumption have noted the ubiquitous appearance of beds in the household across the social scale. Despite this (perhaps because of it) they have ignored them as potential tools for social analysis. Equally, though the gendered use of space is beginning to be addressed, historians of the household rarely utilize its members' bodily interaction with their material environment as a way to understand family relationships. In this paper we use a variety of sources to examine the meaning of the bed: both its 'dematerialised, narrativised'¹ form present in court records, inventories, diaries, and popular literature; and as a three dimensional object, which acted as a discrete space in which key moments of household experience occurred. We will show that, in addition to its recognized economic importance as the most valuable object in the household, the bed was central to the emotional and physical operation of the household. Despite its solidity, it is the functional and symbolic fluidity of the bed that is its most notable feature. The role of the bed was regularly transformed in everyday life: practically into hiding space, or social space, and ritually through its crucial role in marriage, birth and death. The bed, we will argue, operated legally and rhetorically as a metaphor of household relations – it was a key site of struggle between spouses and even children, who sought to gain mastery of the bed-space. Thus, the household did not make the bed, the bed made the household.

Peter Scott & James Walker (Reading)

The determinants of productivity and growth for British department stores in the 1930s

Research into the determinants of productivity within particular sectors prior to the Second World War is severely limited by the absence of disaggregated data for populations of firms. For example, in the UK no individual returns appear to have survived for the only national survey of manufacturing companies, the Census of Production. As a result, research on British corporate productivity during the early twentieth century is generally restricted to analysis of sectoral-level aggregates with intra-sectoral comparisons being limited, at best, to crude data on variations by scale, regional, and sub-sector. Data limitations are particularly severe for distribution; there was no Census of Distribution in Britain until 1950 and international comparisons of Britain's relative productivity in services before 1945 have thus necessarily relied on rather crude and indirect proxies.

Yet despite these data limitations a number of scholars have been highly critical of the efficiency of British retailing during this period. Chandler argued that even British department stores concentrated on a primarily working class market, thus largely limiting their product lines to basic necessities, which in turn resulted in a relatively low minimum efficient scale for stores and required limited managerial hierarchies.² More recent analyses have generally reinforced Chandler's perception of Britain's backwardness in retailing. De Grazia charted the slow adaption of European (and, perhaps to a lesser extent, British) retailing to the challenge of American mass retailing methods during the early twentieth century.³ Meanwhile Broadberry found that the United States had overtaken Britain's productivity lead in distribution by the First World War and maintained a substantial advantage over the interwar period. This was achieved, as in other areas of market

¹ L. Auslander, 'Beyond Words', *American Historical Review* 110, 4 (Oct 2005).

² Alfred D. Chandler, *Scale and Scope. The Dynamics of Industrial Capitalism* (Cambridge: Mass, Belknap, 1990), pp.255-61.

³ Victoria De Grazia, *Irresistible Empire. America's Advance Through Twentieth-century Europe* (Harvard: Belknap, 2005), pp.130-83.

services, via America's 'service sector industrialization' – the shift to high volume, low-margin, business, which required new forms of hierarchical organization and radical technological and organizational change. Conversely British firms were slow to make the necessary investments, inhibited by a less educated workforce, a less competitive environment, and resistance to change among both workers and management.⁴

This article challenges this view of British retailing and Anglo-American productivity comparisons, at least with regard to department stores – the sector of large-scale retailing which is most easily comparable (both on account of data availability and similarities between the functional activities of stores in both countries). The department store sector is also interesting on account of its having gone through a well-documented 'managerial revolution' in America during the period from around 1890-1920. This involved a variety of managerial, technological, and other innovations, though a central feature was the systematic use of detailed accounting data on sales and costs to improve store performance. Innovations such as the retail inventory method (which allowed regular calculations of gross margins and stock without the need for physical inventory) provided regular and up-to-date statistical information, while the development of a standard classification of store expenses made it possible to compare performance across stores for the first time.⁵

The opening of a flagship London store by the American department store chief Gordon Selfridge in 1909 is generally credited as having brought with it the application of US scientific management methods to the British department store sector.⁶ By the 1920s stores such as Harrods were already using sophisticated accounting techniques to monitor sales performance and costs. Archival evidence (including reports from leading US retailers who visited major London stores) indicates only relatively minor differences in managerial techniques by the mid-late 1920s.

Industry-based surveys of department store operating costs, conducted by the Harvard Bureau of Business Research and the London School of Economics, allow direct comparison of store performance and margins for a large sample of stores in both Britain and America, representing a substantial proportion of department store turnover in both countries. Surprisingly, given the picture painted in some historical accounts of British 'backwardness' in retailing, British stores are shown to have had substantially lower gross margins, higher net margins, and much stronger scale economies and turnover rates than American stores of equivalent size. While American stores had higher labour productivity, British stores (which could draw on cheaper labour, and therefore employed it more extensively) generally compared favourably in terms of TFP.

These results are corroborated by contemporary evidence regarding the 'crisis' in American department store retailing during the 1930s. Both gross margins and expenses had been rising relative to net sales for several decades, while stores increasingly relied on aggressive and costly advertising as their means of maintaining competitive advantage. Competition via more elaborate stores and lavish customer services (such as credit, delivery, return privileges, etc.) similarly raised costs.⁷ American stores had become locked into a 'high promotion regime' and found it difficult to make a collective retreat from this high cost equilibrium in the much more difficult trading climate that followed the Great Depression.

Having established that American stores were (by most measures) less efficient than their British counterparts during the 1930s, the paper then explores whether those British stores which had made the most extensive use of the new American-style managerial techniques gained a competitive advantage over their UK rivals. This part of the analysis draws on a sample of surviving original returns from the British surveys, comprising 216 entries, representing a total of 115 separate stores.

⁴ See Stephen Broadberry, *Market Services and the Productivity Race, 1850-2000* (Cambridge: CUP, 2006), pp.84-90, 138-9, & 374.

⁵ Susan P. Benson, *Counter Cultures. Saleswomen, Managers, and Customers in American Department Stores, 1890-1940* (Urbana: University of Illinois Press, 1988), pp.54-5.

⁶ Bill Lancaster, *The Department Store. A Social History* (London: Leicester U.P., 1995), p.116.

⁷ Frank Thomson Hypps, 'The department store – a problem of elephantiasis', *Annals of the American Academy of Political and Social Science*, 193 (1937), pp.70-87, 74-9.

Rather than British stores enjoying superior performance as a result of the more ‘intuitive’ methods of management they are sometimes said to have employed, the analysis indicates that investment in the managerial revolution did yield substantial productivity improvements. Specifically, we show that stores embracing managerial incentives, new accountancy practices, enlightened welfare spending, and investment in modern office equipment, received a ‘modernization’ productivity bonus.

III/D Industrial Revolution in Britain and France

Chair: **Roger Middleton** (Bristol)

C Knick Harley (Oxford)

Cotton textiles and the industrial revolution: competing models and evidence of prices and profits

The course of prices and profits in the cotton textile industry during the Industrial Revolution illumine the nature of the economic processes at work. Some historians have seen the Industrial Revolution as a Schumpeterian process in which discontinuous technological change created large profits for innovators. The succeeding decades are seen as characterized by slow diffusion of the new technology because of technological secrecy and imperfect capital markets limited expansion of use of the new technology. Leading firms grew as profits from innovation were reinvested and eventually the new technology dominated. A more equilibrium view points out the narrow extent of technological transformation and emphasizes industry's rapid expansion of production and the rapid fall in the relative prices of the goods in which the technological change occurred. This article examines evidence of price movement and profits primarily extracted from the accounting records of three cotton firms between the 1770s and the 1820s. Although there were may have been high profits initially for Arkwright and his partners, this evidence indicates that expansion of the industry had led to dramatic price declines by the 1780s and there is no evidence of super profits in cotton textiles over the following generation.

Guillaume Daudin (Edinburgh/OFCE)

Domestic trade and regional markets in late eighteenth century France

What is the right level of analysis of economic performance? Just before the Industrial Revolution, France's population was nearly 29 million inhabitants, more than three times as much as England and Wales (8.3 million). France was probably not a unified economy: to compare it with England, we must identify its pertinent subsets. This is an important question as, for example, unified growth theory models suggest that the size of an economy is a crucial variable for its development. This paper uses an exceptional source on French domestic trade at the end of the eighteenth century to identify French regional markets in a wide range of goods

In the first part, the paper presents its source and the data. The French Revolutionary government decided in November 1793 to fight against the social ills of inflation by imposing a maximum price for numerous goods: food items (excluding grains, that had their own *maximum*), drinks, miscellaneous consumption and production goods, textiles, leather, hats, paper, iron, hardware, wood and fuel. To implement *le deuxième Maximum général*, the French government first asked the 552 French districts to put together a list of the goods they were producing or importing from abroad along with their production or importing price. Parisian administration completed the result of this enquiry and printed a full list of goods produced or imported in France. The French government sent this list back to the 552 districts and required them to list the goods they were consuming with their origin before the economic troubles linked to the Revolution. Using the compiled production prices and a formula for transport cost and trading profit rate, each district was supposed to compute the maximum selling price for each of these goods and send the list back to Paris. In the *Archives Nationales*, one can find the documents drawn up by 68 per cent of French districts. A sample of 88 districts — one per *département* — has been selected. For each of these districts, the list of the goods they were consuming along with their origin has been collected. From this list, it is possible to map the distinctive supply area of each district for 15 different categories of goods.

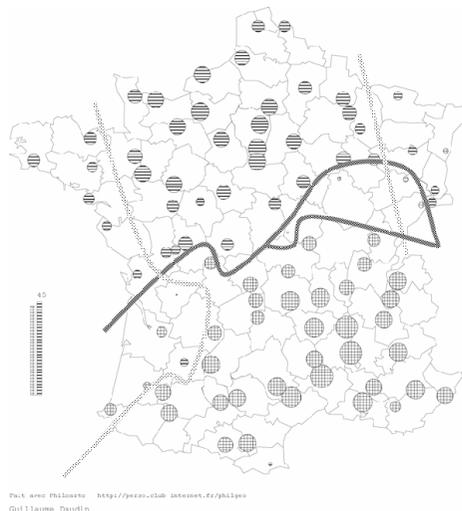
In the second part, the paper checks the data by confronting the district-level information with other sources. The geography of production that is implied by the data is compatible with the production enquiries of the late *Ancien Régime* and the early Revolution. Furthermore, the paper checks that the size of each district population is positively correlated both with the sum of the

number of goods categories supplied to different districts and the sum of the number of goods categories supplied from different districts. The district-level data are plausible.

Before accepting that the bilateral trade data are plausible as well, the third part confronts them with a theoretical gravity model. Trade gravity models have been very successful at explaining the pattern of trade data in a variety of settings. Conforming to a gravity model would make the data more plausible. In contrast with usual bilateral trade data, the data in this paper do not indicate the value of trade flows, but only their existence. Under the hypothesis that each *agent national* recorded the existence of a trade flow if it was superior to a certain threshold, one can use a logit regression in a usual gravity specification. As there is no reason to believe that each *agent national* had the same threshold, consuming district fixed effects must be introduced. Because production capacities and specializations differed between districts, supplying district fixed effects can be introduced as well. Network analysis techniques are used to compute directional transport costs between districts. Transshipment costs and the existence of a custom union — the *Cinq Grosses Fermes* — are taken into account. A gravity equation is run for each goods category. Transport costs, internal borders, transshipment costs and value to weight play the expected role.

The fourth part uses the data to identify regional markets. These are defined, thanks to the central places theory, as spatially continuous groups of districts that have similar supply areas. The paper uses a partition clustering method to identify regional markets. Similarity between two districts is measured by the proportion of common supplying districts among all actual supplying districts. The number of regional markets is determined by computing silhouettes. The silhouette of a district is the ratio between its mean similarity with all the others districts in the same regional market and its mean similarity with all the districts in the most similar regional market. The silhouette of a regional market is the mean of its districts' silhouette. A further cluster analysis using modified Rand indexes to compare partitions identifies four groups of goods.

It is impossible to isolate sizeable regional markets for bulky goods (wood, iron, paper). In the case of the higher value-to-weight goods (hardware, miscellaneous consumption and production goods) France as a whole can be treated as a regional market. For other goods (textiles, foodstuffs and drinks), a larger regional market was organized around Paris and the Seine catchment area and was opposed to a smaller regional market centred on the lower valley of the Rhône. Surprisingly, Atlantic France did not form a regional market by itself. The best candidate for a third regional market was South-West France. The following map gives the regional markets for textiles.



Alessandro Nuvolari & Bart Verspagen (Eindhoven University of Technology)

Technical choice, innovation and British steam engineering, c.1800-50

Traditional accounts of the industrialization process have, more or less explicitly, assumed that a wide range of industrial sectors rapidly benefited from the development of steam power technology. In particular, Rostow's work can be considered as representative of this view of the British industrial revolution. Accordingly, Rostow dated the 'take-off' of Britain in the years 1783-1802, linking it explicitly with the commercialization of the Boulton and Watt engine (Rostow, 1960). More recent research has suggested that such a direct link between steam power technology and the early phases of industrialization is indeed spurious. The available shreds of evidence on the diffusion of the steam engine suggest that the late eighteenth century and early nineteenth century British economy was still dominated by the widespread use of animal, wind and water power (Kanefsky, 1979). Furthermore, the economy-wide repercussions of the progressive adoption of steam technology remained circumscribed until at least the 1840s (von Tunzelmann, 1978 and Crafts, 2004). Therefore, it would seem that traditional accounts have improperly conflated the early development of the steam engine (in particular the invention of the Watt engine) with its economic significance. On the contrary, the studies of von Tunzelmann and Crafts point out that the diffusion of steam power was a particularly long and protracted process. In fact, the widespread adoption of the steam engine had to await a number of improvements that progressively reduced the power costs of the steam engine relative to other energy sources.

To a major extent, the power costs of the steam engine were determined by the degree of fuel-efficiency of the machine. In the first half of the nineteenth century, major fuel economies were achieved by using to a greater extent the principle of 'expansion' in combination with increasing steam pressures. Interestingly enough, these technological developments were introduced before the attainment of a consolidated theoretical understanding of the working principles of the steam engine. Cornish engineers took the lead in the exploration of the merits of the high pressure expansive engine design. Interestingly enough, notwithstanding its superior fuel efficiency, the high pressure engine did not find widespread application in other steam-using regions (in particular in Lancashire and in the Midlands). Thus, a large body of the engineering literature on steam technology in the early nineteenth century was informed by the debate on the different choice of technique characterizing the use of steam power in Cornwall (where the high pressure engine was generally adopted) compared with the rest of Britain, especially the manufacturing districts of the North, where the favourite option remained the Watt low pressure engine.

In this paper we reappraise the debate on the different choice of technique between the two regions using a technology-gap model of localized technical change inspired by the model presented in David (1975, chap. 1). On the basis of the contemporary engineering literature, we also construct new estimates for the capital costs and the total annual costs related with the use of different types of steam engines in various locations. Our results, contrary to the earlier estimates of von Tunzelmann (1978, p.84), indicate that, notwithstanding the differences in coal prices across regions, we cannot rule out the hypothesis of an 'entrepreneurial failure' to explain the delayed adoption of high pressure steam in Lancashire. In the last section of the paper, we investigate the possible causes of this 'entrepreneurial failure'.

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III/E Fertility and Labour Supply

Chair: **Stephen Broadberry** (Warwick)

Enriqueta Camps (Pompeu Fabra)

Poverty and children's work in nineteenth and twentieth century Spain and currently developing countries: first results

In the first part of this paper we portray the relationship between mothers' earnings, fertility and children's work in the Spanish (more specifically the region of Catalonia) context of the second half of the nineteenth century and until the Civil War in the twentieth century. Specific human capital investment in adult working women had as an outcome a sharp increase of their real wage and therefore the increase of the opportunity cost of time devoted to housework including child bearing and child rearing. Fertility evolution is endogenous to the model and decreases as a result of women's real wage increases. Human capital investment of labouring women and mandatory schooling of children shift the labour supply function to a new steady state in which the slope of the function is steeper. According to recent papers this model applies to twentieth century Spain and it causes the abolition of children's work.

Nonetheless, the model stated above does not always apply to current developing countries, at least those in the poorest parts of the world. Although in this second case globalizing forces foster the increase of participation levels by women, women's work is part time and does not allow for human capital accumulation of mothers. In addition, in this second case the increasing economic participation by women goes together with the increasing participation of children. This last fact has perverse effects since the increase of women's and children's work is highly correlated with the increase of infant mortality. In spite of the fact that female levels of participation are high, the low levels of education (and earnings) of mothers imply sacrifices of human capital investment of children. Less quantity and more quality of children arising from fertility control measures appear as an outcome of the positive feedback of the mother's education and the father's incomes.

The increase of infant mortality levels stated above has further consequences on economic development. It does not allow for Williamson's 'Demographic gift'¹ nor for Becker's 'quantity of life convergence'.²

Jordi Domenech (York)

Hours of work and wages in late nineteenth and early twentieth century England and Wales: another look at urban labour market integration

This paper revisits the debate on labour market integration in England and Wales during the second half of the nineteenth century. Using hedonic wage regressions and changes in the coefficient of variation of non-wage workplace characteristics and local disamenities, I show that the apparent integration of urban labour markets in the second half of the nineteenth century can be almost completely explained by changes in the dispersion of hours of work and of local sanitary conditions. Explanations of labour market integration should then incorporate institutional changes such as the spread of regional or national collective bargaining and improvements in sanitary conditions in British cities. As a general conclusion, this paper shows that both Timothy Hatton and George Boyer and Eddie Hunt underestimated the degree of labour market integration in the second half of the nineteenth century.

It is well established by authors like Eddie Hunt, or the tandem George Boyer-Timothy Hatton, that urban labour markets became more integrated in the second half of the nineteenth century (Hunt, 1974, p.59; Boyer & Hatton, 1993, p.728, 1994). These authors looked at nominal

¹ Bloom, D., Williamson, J.G. (1998): 'Demographic Transitions and Economic Miracles in Emerging Asia', *World Bank Economic Review* (September 1998).

² Becker, G. et al. (2005): 'Quantity and Quality of Life and World Inequality', *The American Economic Review*, March, 95:1.

wage differentials in the building trades (more especially of bricklayers) and found a decline in the size of the differential and a declining trend in the coefficient of variation of bricklayers' wages in a sample of English and Welsh cities from 1865 to 1913. The above-mentioned authors were not very specific about the causes of labour market integration, but in general terms, a decline in transport costs and migration are considered to be the main driving force behind the integration process (Hunt, 1973, p.242) (although unions and especially 'new unions' are also mentioned (Boyer & Hatton, 1994, p.94; Hunt, 1986, p.959).

So far, the debate over the integration of labour markets in Britain has not touched the issue of the integration of non-wage components of the employment package, an issue that was addressed for the US by Joshua Rosenbloom and William Sundstrom in the case of hours of work (Rosenbloom and Sundstrom, 1994). The existence of wage premiums in British urban labour markets has been documented since the pioneering contributions of Jeffrey Williamson and John C. Brown on mid-nineteenth century urban labour markets (Williamson, 1981, 1982, 1987, 1990; Brown, 1990) who uncovered the existence of large wage premiums or 'compensating differentials' in nineteenth century England in cities with higher infant mortality or higher probability of disease. In contrast with the previous literature, these exercises implicitly assumed the existence of a hedonic equilibrium within just one integrated labour market (although Brown looked at a much narrower labour market by concentrating exclusively on Northern textile towns).

In this paper, I extend the hedonic wage framework of Brown and Williamson to incorporate hours of work and then investigate the implications for the integration of labour markets. For example, in the case of the US, assuming workers care for higher wages and shorter hours, Rosenbloom and Sundstrom found hours of work to greatly decrease the degree of integration of labour markets, with workers enjoying the highest wages also enjoying shorter hours (Rosenbloom & Sundstrom, 1994). This result in fact mirrors the widely accepted result that the labour supply in the US was backward-bending (Costa, 2000), precluding the existence of premiums for longer hours. The first section of the paper looks at the shape of the labour supply in Britain, which seems to be characteristically non-backward-bending, allowing for the existence of wage premiums for longer hours of work in the hedonic wage regressions (which to some extent might be put in relation to the slow decline in hours of work in Britain after the 1860s after having pioneered the world's short-hour movement, Huberman, 2004, Bienefeld, 1972). Following Rosenbloom & Sundstrom (1994) and Kinoshita (1987), the existence of a sizeable wage premium for longer hours is compatible with the existence of a single, unified labour market.

The existence of large premiums for several workplace and local disamenities provides a different logic for the visible narrowing of wage differentials in England and Wales. Firstly, hours of work became more compressed, with the coefficient of variation for 50 cities going down by 15 per cent from 1886 to 1906. As long as there is no premium for longer hours of work, a compression of variation in hours of work will reduce wage dispersion. If wage premiums for long hours do exist, then wages will be compressed to an extent that depends negatively on the size of the wage premium. In addition, following the consolidation of the Public Health movement, mortality differentials across towns converged in the second half of the nineteenth century, especially after the 1870s (Wohl, 1981; Szreter, 1992; Mooney & Szreter, 1998). There are no adequate infant mortality data for the mid-nineteenth century that I know of, but it is possible to proxy the convergence in mortality conditions by using the estimates of life expectancy at birth in the English counties (10-year averages) calculated by Graham Mooney and Simon Szreter (Mooney and Szreter, 1998). From this study, we can see how the coefficient of variation of life expectancy went down by 15 per cent from the 1860s to the 1890s. To what extent this number proxies the change in the coefficient of variation of infant mortality is debatable but in principle it should lie quite close to the true number. Table 1 gives an overview to changes in the variables of interest here.

Table 1: *Changes in the coefficient of variation. Local averages of earnings and hours of work for bricklayers and local life expectancy*

	Nominal wages (1867-1913)	Summer hours (1886-1906)	Life expectancy (1860s-1890s)
Change in CV	-33%	-23%	-15%

Source: 1886 and 1906 Earnings and Hours enquiries, Mooney and Szeleter (1998).

Table 1b: *Means and coefficient of variations of real wages and hours of work in 1886 and 1906 in a sample of 50 cities*

	Hours 1886	Hours 1906	Real wages 1886	Real wages 1906
Mean	53.47	52.79	0.383	0.454
CV	0.0031	0.0024	0.0124	0.008

The paper is divided as follows. Section 2 presents the analysis and the main sources of data and their problems. Section 3 discusses the results for the first-stage labour supply regressions and the hedonic wage regressions. Section 4 draws the implications and concludes.

IV/A Agriculture

Chair: **Richard Hoyle** (Reading)

Ingrid Peters-Fransen (Canadian Mennonite)

Mennonites in West Prussia, 1776-89: economic status, occupation, and landholding

Mennonites, a Christian denomination dating from the time of the Reformation, left the Netherlands in the sixteenth century to settle as farmers in the Vistula Delta of West Prussia with the intent of draining the delta. Despite losing approximately 80 per cent of the settlers in the almost century-long reclamation project, they became known as good farmers: They were praised for the drainage and reclamation of land by the Polish king Wladislaus IV in a 1642 charter and were highly regarded by Frederick the Great over a century later as superior farmers. Known for his religious toleration, Frederick the Great granted the Mennonites exemption from military service in recognition of their pacifism but they had to pay 5,000 Thalers annually. A census taken in 1776 identified Mennonite households who were liable for the levy. The purchase of 296 tracts of land from 1781 to 1784 left the Mennonites in possession of about 200,000 acres (80,000 hectares) of the 400,000 acres of the best lowlands of the Vistula Delta but it also reduced the number of men available for military service because military service was tied to land ownership. In 1789, after the death of Frederick the Great, the Mennonites were once again promised exemption from military service but were restricted from buying more land. To enforce this limitation on land ownership, a census taken in 1789 identified Mennonite landholdings.

The two eighteenth-century censuses of Mennonites in West Prussia – the one taken in 1776 and the other taken in 1789 – provide us with information about their economic situation. The 1776 census of 2,638 households records the name of the head of the household, location, occupation, household size, number of servants, landowning status, and economic status (classification by Prussian officials); the 1789 census of 2,443 property holdings (held by 2,207 owners) records the name of owner and the location and size of plot. Each census individually provides a picture of Mennonites in eighteenth-century West Prussia but the databases can be merged, if only incompletely, to add the size of the landholding to the original census data. The merging of the census data is fraught with difficulties and results in a significant decrease in the number of observations: 13 years have passed between the two censuses and the owners in 1789 are not the same as the owners in 1776, the owners in 1789 may hold multiple plots, and given the relatively small number of names (14 entries with the name Peter Dick in the 1776 census and 9 entries with the equivalent name Peter Dyck in the 1789 census, for example), it is difficult to identify individuals at times. Nonetheless, the merged database has 471 entries.

There are two lines of enquiry that are pursued. First is the question of whether the portrayal of Mennonites in West Prussia as farmers, and superior farmers at that, is substantiated by the 1776 data. What occupations did the Mennonites have and what occupations were they successful at? Given that Frederick the Great compared West Prussia to Canada and its inhabitants to the Iroquois (a native group in North America), one would suspect that West Prussia was primitive and largely agricultural so it is somewhat surprising that only 70 per cent of the Mennonites were farmers. Given their ownership of some of the most fertile land and their reputation as superior farmers, one would suspect that the economic status of Mennonite farmers would be good but it is those who are plying their trades in the Danzig environs who are disproportionately better off. The other line of enquiry is to compare Mennonites in West Prussia to other populations in the eighteenth century. Compared to other commoners, Mennonites were land-owners and the average land-holding of approximately 40 acres is comparable to average land-holdings in other places where aristocracy are included among the land-owners. Similar to other studies, the economic status of close to 25 per cent of the Mennonites was middling or better.

The data collected in the censuses in 1776 and 1789 do not support the general picture painted of Mennonites as better-than-average farmers. Mennonites appear to have been largely representative, constituting 2 per cent of the population of West Prussia and 2 per cent of the

population of Danzig. Their status as land-owners, and owners of approximately 50 per cent of the most fertile land, did not translate into good economic outcomes for the agricultural population. The category of 'schlecht', or in direct translation 'bad', which I am interpreting to be common, was assigned to approximately 75 per cent of the population. It was urban dwellers living in the Danzig region (but not those in Elbing), rather than rural, who were better off economically than average.

Juan Carmona & James Simpson (Carlos III, Madrid)

Why sharecropping? Explaining its presence and absence in Europe's vineyards, 1750-1950

The traditional view that sharecropping was a cause of the low productivity in European agriculture prior to the Second World War has been challenged by economic historians in recent years. Therefore while sharecropping might produce a potential sub-optimal use of labour and capital, as Marshall argued, it is often argued today that the contract was efficient both at reducing monitoring costs and in allocating risk, especially when markets were weak for working capital. Thus, rather than a causality which runs from sharecropping to low productivity and poverty, most economic historians today argue that it runs in the opposite direction.

Yet the presence of sharecropping still requires to be explained. If it was a relatively efficient contract, why was it not found more often? European agriculture was highly diverse, but the presence of risk (widely fluctuating yields and prices), low level of human capital, poverty, monitoring costs and the need for work incentives were widespread. Under what conditions can it be said that sharecropping was likely to be the preferred form of tenure, and under what conditions was it likely to be absent?

In this paper we try to identify when sharecropping was preferred to other forms of working the land, such as wage labour, small owner-occupiers or fixed rent contracts. To simplify our task we concentrate on the vine and two products: beverage and fine wines. The vine was widespread in France and, if sharecropping was widespread in some regions, it was almost totally absent in others. For example, in the late nineteenth century sharecropping was found on three-quarters of Beaujolais' vines, yet it was almost entirely absent on the neighbouring vineyards around Lyon or in Burgundy's fine wine production 60 kilometres further north. Viticulture has also figured extensively in the current debates on European sharecropping (Hoffman, 1984; Epstein, 1994; Cohen & Galassi, 1990; Galassi, 1992 and 2000; Carmona & Simpson, 1999; Ackerberg & Botticini, 2000 and 2002; Biagioli, 1987). Most of these debates focus on monitoring costs, suggesting that wage labour and fixed rental contracts will lead to problems of moral hazard as the vine is easily damaged (Hoffman, 1984; Carmona & Simpson, 1999; Allen & Lueck, 2002; Ackerberg & Botticini, 2000); risk aversion that is mainly linked to poverty (Young, 1794; Ackerberg & Botticini, 2002); or a situation of 'lock-in' (Carmona & Simpson, 1999).

This paper suggests three other hypotheses. First, that the appearance of new vine diseases in the second half of the nineteenth century increased risk and discouraged specialization, making sharecropping more attractive. Second, that the increasing economies of scale found in the long-distance marketing of wine would favour large landowners and sharecropping, although this trend would be checked by the widespread appearance of co-operatives after the First World War. Finally, that sharecropping contracts shifted away from attempting to resolve problems of the limited access to credit by tenants, to providing a wide and flexible range of labour contracts for landowners.

The paper has five sections. The first provides a brief outline of the current debate on sharecropping in European agriculture and its presence in viticulture. This is followed by a discussion on the transformation of viticulture during the period, and how this changed the contractual needs of economic agents. We then attempt to understand the presence and absence of sharecropping in different regions. First, with fine wine production in areas such as Bordeaux and Burgundy (Cote d'Or), where special contracts known as 'prix-facteur' were developed which combined some features of labour contracts (fixed salary) with those of sharecropping (benefits related to production and price). Second, with the geographical shift in production to the Midi after 1850, and the associated technological changes found in grape production and wine-making. Finally,

we consider the changing nature of sharecropping in the Beaujolais region from the seventeenth century.

We conclude that sharecropping contracts were highly adaptive to changes in factor and commodity markets, and that they appeared and disappeared with frequency over time, suggesting that there were few problems of institutional ‘lock-in’. Although entry costs in viticulture remained low, the need to compete in distant markets implied that small growers found themselves at a disadvantage, but the growing presence of co-operatives reinforced the position of the small family farm, rather than a system of sharecropping where landowners sold the wine.

Nick Hanley, Kostas Angelopoulos, Dugald Tinch, Althea Davies (Stirling), & Fiona Watson
(Past Experience)

The effects of agriculture on biodiversity, 1600-2000

Addressing the causes of biodiversity loss has been an important theme in environmental economics work in the recent past, as evidenced for instance in work by Barbier on drivers of rainforest loss. But at the empirical level, this work has been limited to looking either at recent cross-sectional data (for example, species loss by country) or at rather short-duration time series data, typically looking no further back than the 1970s. At the same time, conservationists around the world, but especially in Europe, have lobbied for policies which restore currently-degraded ecosystems to some past ‘ideal’, often without a clear picture of what this past system looked like, or how it functioned in the context of past local, national and global economic pressures.

In this paper, we make use of the technique of pollen analysis to re-create a picture of plant biodiversity in Scotland up to 1,000 years ago. We then construct a numerical index of biodiversity based on this analysis. Panel data analysis techniques are then used to regress this indicator on socio-economic and natural system ‘drivers’, which we build up partly from detailed documentary historical analysis, and partly from long-term climate records. The socio-economic drivers consist of agricultural prices, measures of technological change, and of changing land ownership. Our econometric approach allows us to capture both demand and supply side shifters for livestock prices, in a way which allows us to use livestock prices as a proxy of (unobserved) stocking rates. Ecological theory suggests that stocking levels should be a key determinant of plant diversity.

We are unaware of any other study which has been able to take such a long-run view of these questions, from the perspective of economics.

The case study is plant biodiversity change in the Scottish uplands. Twelve farm sites were selected for analysis, representing a range of environmental, cultural and economic conditions. Pollen samples were taken from peat cores extracted from each site. Layers in these samples were then dated using a mixture of carbon¹⁴ and lead²¹⁰ dating. Plant species represented in these peat layers were then identified from pollen remains (the pollen signal ‘picks up’ contemporary plant species in a radius of between 50m-1000m at our sites), and from this a biodiversity index was constructed, representing the diversity in plant species at each point in time for each site where a pollen date is obtained. A simple plot of these data shows our measure of biodiversity falling and rising over time; there is no monotonic ‘post agricultural improvement’ trend in biodiversity.

To relate these movements in estimated diversity over time to environmental, economic and social factors, a panel data analysis was undertaken. Assembling the independent variables for this analysis was a difficult task. We chose to restrict the quantitative analysis to the period beginning in 1580, since historical data is scarce in Scotland before this period. We then analysed original historical sources (farm records, court records, local administration records) to compile observations for a range of factors for each site over the period 1600-2000.

A 20-year time-step was used to construct the panel. Data was collected on:

- Local relative prices for arable crops and livestock (sheep, cattle)
- Wages
- Land ownership and land tenure change
- Technology change, such as new breeds, varieties or cultivation techniques

- War and other extreme civil events
- Extreme weather events
- Trends in climate
- Population

Results show that periods of rising livestock prices are associated with falling levels of plant diversity, as farmers increase stocking rates. Falling prices lead to rising levels of biodiversity. Technology change variables do not show up as statistically significant over time, although a measure of how intensely the site was cultivated year-round is significant. Our climate change or extreme weather event variables did not turn out to be statistically significant either.

We conclude by noting that the combination of paleo-ecology, history and economics can give original and powerful insights into long term changes in biodiversity in areas where an adequate peat sequence can be found, and where adequate documentary sources exist. This, however, is a tough call.

Note: we thank the Leverhulme Trust for funding this research.

IV/B Health and Fertility

Chair: **Judith Spicksley** (Cambridge)

Sara Horrell (Cambridge), **David Meredith** & **Deborah Oxley** (UNSW)

In the foothills of Mt. Waaler: body mass and life chances in mid-Victorian London

Height, weight and body mass are three key anthropometric measures of the nutritional status of present and past populations. They measure living standards, especially food adequacy and resource distribution; under-nourishment and economic performance; and health. Hans Waaler's classic longitudinal cohort study of 1.7 million Norwegians in the 1960s and 1970s established a set of identities between height and body mass with morbidity and mortality. Tall men with a body mass of between 23 and 25kg/m² suffered comparatively low health risks, while the short and malnourished were at a distinct disadvantage. The same factors that led to short stature also compromised the quality of vital organs and the body's resistance to biological challenges. Over the last century, improvements in nutrition led to gains in height, weight, bodily robustness and longevity – or, more boldly, to a techno-physio evolution (Fogel & Costa 1997). Mean heights of Englishmen have gained 9cm, mean weights 19kg, and life expectancy has doubled (Fogel 2004). This modern-day triumph has been labelled as 'climbing Mount Waaler' (Deaton 2005).

This paper employs individual-level data on the heights and weights of 32,000 prisoners incarcerated in London in the third quarter of the nineteenth century. It includes boys and girls, men and women, the young, the elderly. Consequently, it offers insights into ageing, as well as a direct measure of cumulative and current nutritional status. Velocity of growth, terminal heights, and differences between groups in society, are identified. Body mass is mapped for different groups, and over the lifecourse. Comparison is made with James Riley's study of the Beddoe Men (Riley 1994). Finally, the paper uses iso-mortality-risk and iso-morbidity-risk curves to suggest the health impacts of under nourishment at this time. The implications for human welfare, labour markets and poor households are considered.

Gareth Austin (London School of Economics), **Jörg Baten** (Tuebingen and CESifo) & **Alexander Moradi** (Oxford)

The anthropometric history of Ghana, 1880-2000: an exploration

The height development in Africa before the mid-twentieth century is still one of the almost completely unexplored fields in anthropometric history. Heights can shed light on the biological components of the standard of living, as they proxy net nutritional status of populations, and tend to be correlated with health and longevity. It has proven extremely difficult to mobilize anthropometric data in sufficient quantity and quality for the African continent. Finally, in attestation forms of the Gold Coast Regiment, we found height data from the colonial period that allows height estimation for 1880s to 1920s birth cohorts.

Ghana provides interesting insights into African ecological diversity, as the north and south of the country are fairly typical of, respectively, the savanna and forest zones of West Africa. Ghana's experience during colonial times is also extremely interesting. In late-nineteenth and early-twentieth century Ghana major economic and social changes took place that tremendously shaped the daily life of the indigenous population. The development of the agricultural export economy, already under way after the ending of the Atlantic slave trade, was consolidated by the adoption of cocoa, of which Ghana became the world's leading producer. Cocoa farms, and European-owned mines, attracted extensive migrant labour to the forest zone, from the savanna areas from which slaves had previously been imported. How far did the indigenous population benefit from these developments?

In our analysis we also include anthropological studies and survey data for the 1940s to 2000 period, such as the Ghana Demographic and Health Surveys and the Ghana Living Standard Surveys. Thus, for the first time, a long run trend can be estimated for an African country. Preliminary results from a number of observations of an initial feasibility study indicate that the difficult situation of the 1880s and 1890s led to a stagnation of heights, partially caused by the violent conflicts of the time.

Between 1900 and mid-twentieth century, the anthropometric values improved substantially. The increment exceeds the one that could be considered a peace dividend. In fact, the biological component of the standard of living has developed more positively than previously thought. The African peasantry has flourished and poverty fell significantly. It might also have been partially caused by the spread of knowledge about hygiene and by public health measures, which were typical for early-twentieth century developments. The development after independence displays much lower height increases. A nutritional crisis occurred in the 1970s when Ghanaians were hit by a severe economic crisis. Finally, the regional welfare differences within early-twentieth century Ghana can be assessed for the first time. Northern Ghana, despite its comparative poverty in cash terms, appears to have benefited from its higher cattle ratio: protein malnutrition was somewhat less pronounced in this region.

Mikolaj Szoltysek (Cambridge)

The missing link: Central European family patterns and the reconsideration of P. Laslett's hypotheses

Much of the study of historical family forms has been focused on codifying, cataloguing, classifying as well as mapping (Le Play 1937/1879; Laslett 1977; Wall 2001). Although since the era of Federic Le Play's pathbreaking studies the field has been entered by the genres of revisionists and undergone severe challenges and transformations (Laslett 1972; Berkner 1972; Goody 1996; Mitterauer/Sieder 1983; Mitterauer 2003), advancing a system for categorizing family types and for picturing their geographical distribution in historical Europe continues to be one of the central preoccupations of comparative family history (Plakans & Wetherell 2001; Thornton 2005). As far as their authors are concerned, pronounced efforts have been made to anchor these classificatory ventures in complex structural-functional explanations of overarching comparative ambitions (Laslett 1977; Laslett 1972; Hajnal 1982; Laslett 1983; Mitterauer 2003; Kaser 2002). In all these debates the place of Central Europe was rather ambiguous and Janus-faced. It has often been portrayed as being somewhere between the extremes of the western and eastern types (Laslett 1983; Plakans & Wetherell 2001). But in none of these endeavours, however, has an attempt been made to describe precisely where 'the west' ended and where 'the east' began.

It is now clearly recognized that both Laslett's and Hajnal's generalizations about Central European family structures must be considered as highly speculative, because in the 1970s and early 1980s they were based on few and scattered data (Laslett himself did not include any sources from Poland; Laslett 1983: pp.526, 529). These shortcomings continue to afflict recent comparative studies. Despite an enormous expansion of research in family history and demography operating now within Eurasian comparative setting (Fauve-Chamoux & Ochiai 1998; Derosas & Oris 2002; also Wall 2001), the picture of family forms in Central Europe remains highly incomplete.

In this presentation an attempt will be made to fill this gap. Our principal goal will be to reassess the picture of Central European family patterns within an (all-) European setting. An analysis of nearly 100 parishes and localities from territories of the historical Kingdom of Poland (including the Kingdom's core areas, as well as Silesia and the easternmost regions of present-day Ukraine and Byelorussia) from the end of the eighteenth and the beginning of the nineteenth centuries will be carried out. In order to determine the actual position of this area on the map of Europe's historical family forms, an extension of Laslett's classificatory scheme will be applied. Statistical tools such as analysis of variance and cluster analysis will be used to test the homogeneity/heterogeneity of the Polish sample in terms of the incidence of particular household forms, the presence of servants and lodgers and people's life course patterns. These results will be compared with data from other European regions. Special attention will be paid to comparisons with the sample of English households collected by the members the Cambridge Group.

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IV/C Great Depressions

Chair: **Paolo di Martino** (Manchester)

Peter Fearon (Leicester)

Work relief, dole and unemployment during the New Deal: a Kansas case study

Persistent mass unemployment was one of the most perplexing issues facing policy makers in the United States during the Great Depression. The most widely accepted estimate of national unemployment charts its rise from just over 3 per cent of the labour force in 1929 to 25 per cent in 1933. From that point the numbers out of work began to decline but even in 1937, the best year for the economy during the 1930s, over 14 per cent of the civilian labour force was out of work. The costs of continuing unemployment had a marked influence on government policy. By the late 1930s the United States was committing a greater share of its national product to social spending than any other industrialized country. Between 1933 and 1940, for example, over six million households were assisted each month by federal works programmes, or by other forms of public assistance. In early 1934, when a peak was reached, these households contained over 28 million people and even during the fall of 1937 more than 13 million fell into this category.

Although committed to helping people who through no fault of their own had fallen on hard times, New Dealers feared the creation of a dependency culture. They, unlike the nation's growing body of social workers, were strong supporters of means testing for all relief applicants and were also vigorously opposed to dole payments. As a result, US policy makers emphasized the benefits of work relief to the point of obsession. They firmly believed that creating work projects for the needy unemployed would maintain both morale and work skills, and make them more attractive to the private sector employer. Dole payments, on the other hand, were a sure way to destroy the energy and confidence of the jobless.

Because of the economic collapse, millions of Americans looked to Washington for help where previously their local communities had ministered to them. However, compared to Britain, France and Germany the US had a small central government. Although federal involvement in welfare provision increased dramatically under the New Deal, inevitably the states and the localities still had an essential role to play in caring for their destitute. The large number of relief initiatives necessitated the creation of a vast bureaucracy, not only in Washington but also in the states and the counties. Indeed, the relief programmes should be seen as a partnership between Washington and the state administrations which had to implement federal policy. Local social workers had to provide a continuing welfare service to enable clients to move from a state of dependence to one of self-support.

I will concentrate on the operation of the most significant New Deal relief agencies: the Federal Emergency Relief Administration (FERA), the Civil Works Administration (CWA) and the Works Progress Administration (WPA) in Kansas. Kansas is an interesting choice for a case study because the relevant archive material is excellent. Moreover, in late 1933, the state relief administration was identified by federal field agents as being one of the most efficient in the country. It is interesting to note that Kansas was able to deliver New Deal relief programmes so effectively even though a Republican administration controlled the state during the years 1933-36.

Because New Deal relief policy depended upon the creation of an effective partnership between the states and Washington a single state case study can illustrate national rather than merely parochial problems. Amongst the questions that guide this analysis are: What was the relationship between Washington and Kansas? How did it evolve? Were there any points of conflict? What were the characteristics of the state's unemployed? How was work relief managed? Was federal funding sufficient? What were the implications of means testing? How were work relief clients chosen? How was the wage structure derived? Was work relief effective in providing a supportive environment so that those employed could readily move to private sector employment? Were the appropriate skills developed in the men and women who secured project work? Did those employed on work relief projects search for alternative jobs, or were they provided with a level of security that acted as a

deterrent to private employment? Should relief workers be classified as employed rather than unemployed? What were the costs and the benefits of work relief?

Gary Shea & Alex Trew (St Andrews)

Dynamic financial coalitions and economic growth in the UK

1. Theoretical introduction and background

The emergence of a new growth theory which makes endogenous the rate of growth of technological progress or intangible capital (such as human capital) accumulation in determining the long-run growth rate of an economy has gained great favour since its introduction (Romer, 1986, 1990; Lucas, 1988).

Our research seeks to establish a growth theory that can account better for persistent disparities in income levels, as well as improve our understanding of the rapid growth seen in some countries since the middle of the twentieth century. We intend to combine expertise from economic history, finance, theory and development, and use modern techniques to consider the micro-foundations of growth. Initial research has proved very fruitful (Trew, 2006; Nolan, Shea & Trew, 2005).

2. An historically-congruent theory of dynamic financial coalitions and growth

A simple insight from the historical literature has framed the way in which we have developed theories: Individuals form coalitions of agents to provide finance for investment projects where fixed costs are a large element of total costs. The mass of the coalition, the spatial dispersion of its members, and the degree of trust between agents are all key to the development experience in this context, and all enter into the crucial decision over production technologies (Trew, 2007).

The Industrial Revolution in Western Europe holds a number of key facts that aid our understanding of the growth process. Cottrell (1980) and Harris (2000) both point to the importance of information problems, of spatial dispersion and of the legal and institutional environment. In the initial stages of low growth and underdevelopment, financial coalitions are small and invest in small, local, low-return projects. In the later stages we see specialized financial intermediation in the shape of banks and equity markets that facilitate higher levels of sustained growth in incomes.

We have developed two theories that can account for these stylized facts: the first is based upon a simple top-down specification of the finance-growth mechanism; the second looks to understand the micro-economic roots of observed phenomenon.

3. Illustrations from early Lancashire railway development

The finance of industry *per se* has been shown not to have constrained economic development. Problems in raising finance for investment largely occur where the fixed cost as a proportion of the total investment is large. Large-scale infrastructure projects, undoubtedly crucial for the development of an economy are thus prime examples of the class of investments in which financial conditions can have a large effect on economic growth. This has been demonstrated in a number of studies, such as Milward & Saul (1973), Mathias & Postan (1978), Buchanan (1986), and Turnbull (1987), *inter alia*.

We analyse a unique and highly detailed historical dataset (Shea), which covers micro-data of actual coalition formation in the finance of UK infrastructure (primarily canals and railways, but including also gas and waterworks projects). In this paper we concentrate on the development of early railways in Lancashire (1825-36) and show how data pertaining to them can be combined to depict a broad, disaggregated and evolving picture of financial coalitions. Initial analysis strongly supports both the more general suppositions of historians on the ways in which finance is collected, specifically via regional coalitions, and is consistent with our theoretical efforts.

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Monique Ebell & Albrecht Ritschl (Humboldt, Berlin)

Britain's great depression, 1920-80: a general equilibrium approach

Numerous attempts have been made in the literature to link Britain's disappointing levels of investment and per-capita income in the interwar and postwar period to trade union activity and monopolization. In this paper, we adopt a unifying perspective on Britain's macroeconomic performance between the depression of 1920 and the supply-side reforms of the 1980s. We calibrate a model of monopolistic competition and search frictions in labour markets, in which unions appropriate their share of monopoly profits through collective bargaining. We argue that pro-union reforms after World War I combined with monopolistic structures in the British economy to establish a new steady state, characterized by below-trend levels of income and employment. We find that this equilibrium essentially persisted throughout the postwar period until the 1970s. We also offer a new interpretation of the supply side reforms of the 1980s, arguing that privatization and competition policy were key in reducing monopoly rents and thus the incentives for workers to unionize. As a result, the British economy has begun converging towards a new steady state characterized by higher per-capita incomes, investment rates, and lower degrees of unionization.

IV/D Finance, Cycles and Globalization

Chair: **David Chambers** (Oxford)

David S Jacks (Simon Fraser), **Christopher M Meissner & Dennis Novy** (Cambridge)
Trade costs in the first wave of globalization

Trade costs impede international economic integration. They also drive many key findings in the contemporary open-economy macroeconomics literature. Amazingly, economists know little about the magnitude, evolution and determinants of these obstacles to international trade. While research on the nineteenth century trade boom has tracked certain costs like freight rates and tariffs reasonably well, and proxies for information costs and monetary regimes have been examined, the magnitude and impact of a host of other important impediments to trade remain unexplored.

In this paper, we present a new comprehensive measure of trade costs during the first wave of globalization from 1870 to 1913. We derive this from a micro-founded multiple-country general equilibrium model of trade in differentiated products that incorporates trade costs. These costs are broad and encompass not only shipping costs and tariffs but also many other informational, institutional and non-pecuniary barriers to trade. The model yields a ‘gravity’ equation of international trade which we then use with trade and output data to compute implied bilateral trade costs. The outcome is a theoretically consistent measure of bilateral trade integration which can then be averaged over trading partners to provide a measure of overall integration with the global economy.

Measured trade costs exhibit considerable variation over time and space. The baseline findings demonstrate that the average level of trade costs fell by 10 per cent in the 40 years before World War I. This decline explains nearly 40 per cent of the total growth in bilateral exports. We attribute the rest of the growth of international trade to economic expansion. The fall in trade costs also fell much more quickly between 1870 and 1880 than between 1880 and 1913.

Trade costs dropped more slowly amongst the most advanced countries of the period than they did between core and periphery nations. Nearly all the increase in trade integration amongst the richest countries between 1870 and 1913 was due to economic expansion. Country pairs like France and the UK and the US and UK have flat or slightly rising measures of trade costs. Neither did these countries experience large declines in their trade costs after 1870 with their major trading partners. Nevertheless, the North Atlantic region had the lowest trade cost levels throughout the period. Conversely, declines in trade costs explain the majority of the increase in integration between the less developed and the richer countries in the same period. Different regions faced different drivers of trade.

Changes in trade costs were not as large as suggested by the roughly 2 per cent annual decline in freight indexes between 1870 and 1913. Our trade cost measure declined at a rate of about 0.2 per cent per year for the average country pair. We argue that transportation costs are only one input into trade costs. The novel interpretation of the late nineteenth century is that changes in overall trade costs were ostensibly small. However, large increases in trade can occur even when trade costs only change a little in standard macro models.

In terms of levels, the median country pair has a trade cost equivalent to imposing a tariff on the price reigning in the export market of 90 per cent. At the same time, their values (again in tariff equivalents) range between 28 per cent to nearly 228 per cent. In 1913, the median tariff equivalent had decreased slightly to 76 per cent, and the bottom and top end fell somewhat to 25 per cent and 199 per cent. The most highly developed countries seem to have the lowest average trade costs. On the other hand, small, remote, and less developed countries seem to have the highest levels.

After examining these levels and trends, we turn to the determinants of trade costs. This exercise demonstrates the sensibility of our trade cost measure. Conventional wisdom is that transportation improvements were the key to the increase in international integration prior to 1913. But recent work on nineteenth century commodity markets has shown that falling trade costs were driven by factors such as monetary regimes and trade policy rather than technological factors

affecting shipping costs. Other papers in the gravity vein have looked at bilateral trade flows between 1870 and 1913 and found that monetary regime coordination, as well as cultural and political factors, played a very important role in explaining trade patterns. We seek to expand on these studies by looking at these and other components including shipping costs, geographic constraints, institutions and cultural links, policies and non-tariff barriers.

Our evidence suggests proximity was the most important factor in explaining the variation in the data amongst all of the various determinants of integration. Secular reductions in maritime shipping costs and other overland freight costs decreased the wedge of distance so that other factors increased their relative importance in driving integration in the years just prior to 1913. Also, shared legal institutions and administrative practices that former Latin American colonies inherited from their colonial period did not lead to lower trade costs amongst them while a shared language and membership in the British Empire increased integration. These two latter factors seem to be as important as tariffs and exchange rate policy in affecting the size of trade costs. It is possible that information flows, informal and formal contracting mechanisms, marketing techniques and financial factors also play a role, but only limited qualitative information is available so far. A sizeable fraction of trade costs remains unexplained by all of these observables and so this paper provides a challenge for further research on these issues.

Albrecht Ritschl (Humboldt, Berlin) & **Martin Uebele** (Humboldt, Berlin and Warwick)
Stock markets and business cycle co-movement in Germany before World War I: evidence from spectral analysis

Among the industrialized countries, Germany compares relatively favourably in terms of our knowledge about national income and output in the nineteenth century. No less than four different estimates exist that go back to the early 1850s. However, there are major differences between these series regarding their business cycle characteristics. All available estimates rest on the seminal work of Hoffmann (1965) and earlier work of Hoffmann & Müller (1959). Hoffmann and his collaborators collected and aggregated a vast amount of data to produce independent estimates of output, expenditure, factor income-cum-employment, and the income tax base. The inevitable inconsistencies and deviations have generated a literature that called for improvements and corrections of the most obvious problems (Fremdling, 1988 and 1995; Holtfrerich 1980).

Recent work by Burhop & Wolff (2005) is a systematic attempt to apply these corrections and obtain revisions of all four data series for the pre-1914 period. However, even these improvements yield business cycle chronologies that are inconsistent with each other.

The above-mentioned uncertainty about the business cycle chronology for the later nineteenth century is special. Rivalling GNP estimates presented for the US by Balke & Gordon (1989) and Romer (1989) differ in their volatility, but far less so in the business cycle dates they imply. Two independent estimates of British GNP presented by Feinstein (1972) exhibit minor differences in levels but not in the business cycle chronology. In contrast to that, discrepancies between the various German series are so substantial that no consensus view of the business cycle between 1871 and 1913 has emerged so far.

This paper sets out to shed further light on this issue by introducing additional information. We refrain from refining one or the other of Hoffmann's series which, given the improvements made by Burhop & Wolff (2005), would be subject to decreasing returns. Instead, our approach is to exploit the information content in a completely different set of data that has been neglected in the debate so far.

These data include both the stock market and various disaggregate indicators of real activity. After 1870, when stock market law in Germany was deregulated massively, a public offering boom set in. It resulted in a ratio of market capitalization to GDP of over 40 per cent, a level that was only reached again in the 1990s (Rajan & Zingales 2003). Thus, stock prices reflected information on a substantial portion of the German economy. If the stock market was exicent at the relevant horizons, this information can be exploited to help establish a unified business cycle chronology, and to

determine the information content of the rivalling national output series at the business cycle frequencies.

According to established asset pricing models, stock prices should be pro-cyclical and lead the business cycle (Campbell, Lo, & MacKinlay 1997; Cochrane 2001). This property also carries over to stochastic growth models with capital. Boldrin, Christiano & Fisher (2001, 1995) and Jermann (1998) found that production models with capital adjustment cost and habit persistence provide a good characterization of major business cycle facts. In these models, costly adjustment of the capital stock drives a wedge between the price of existing and new capital goods, inducing a positive correlation between this relative price, or Tobin's q , on the one hand and investment and output on the other.

We explore this connection between stock prices and real activity both in the time and frequency domain, focusing on the relevant business cycle frequencies. We find significant co-movement between the stock market and most of the German GNP estimates at similar frequencies. As most available series are either constructed from nominal data using price deflators, or are a convolution of real and nominal series the patterns of coherency are seriously affected by deflating. For this reason, we focus much of our attention on nominal series, both for national product and stock market prices.

We find the closest co-movement with the stock market is exhibited by nominal wages, a sub-series of Hoffmann's (1965) income/employment estimate. Wages trail the stock market by one to two years, and show an impressive co-movement with the financial market.

Our results are corroborated by inspection of disaggregate indicators of real investment. Wagenführ (1933) and Spiethoff (1955), among others, presented and examined disaggregate indicators of investment like coal and steel production. We show that rather than just reflecting price level movements, nominal stock prices and nominal wages exhibit substantial co-movement with such indicators of real investment and general business cycle activity. Our results clearly support the traditional NBER business cycle chronology for Germany established by Burns & Mitchell (1946), as well as the results of Spiethoff (1955). At the same time, the compromise estimate by Burhop & Wolff (2005), along with the business cycle chronology they suggest, appears to perform poorly under any of these additional checks.

Carlo Brambilla (Bocconi) & Giandomenico Piluso (Siena)

Are banks procyclical? Evidence from the Italian case, 1896-1975

During the last years, a number of studies on banking systems' pro-cyclicality were published (Rajan, 1994; Bikker & Hu, 2002; Goodhart, Hofmann & Segoviano, 2004); such an issue, often developed as a consequence of Basel agreements on risk ratios, has to do both with credit crunch phenomena and with stability of financial intermediaries (Bliss & Kaufman, 2003). Indeed, many studies have emphasized the relationship between business cycles and financial stability in order to provide models and analysis for central bankers and financial regulators. This kind of approach is often referred to as macro-prudential analysis and can provide authorities responsible for preserving financial stability with useful tools (Kaminsky 1999; Logan, 2000). Usually, analysis takes into consideration medium-term periods, whereas studies on the long-run relationship between business cycle fluctuations and the banking system are astonishingly lacking. That is, it is hard to reach robust assessment on the macroeconomic relations between business cycles and financial systems while structural changes occur. In particular, it is currently not possible to assess how important such a relation (if any) is when institutional breaks and/or technological innovations take place.

Economic literature generally considers banking systems as naturally pro-cyclical, without distinguishing among different patterns of bank specialization. Banking systems would suffer – and to some degree amplify – cyclical variations in credit demand and in borrowers' behaviour (Berger & Udell, 2002; Beranger & Teiletche 2003; a counter-cyclical hypothesis is in Eber, 1998). Thus, pro-cyclicality would affect the continuity of capital formation processes, hence having a significant impact on the determination of growth rates and timing (Demirgüç-Kunt & Levine, 2001). Usually, the pro-cyclical behaviour of credit systems is measured through an indicator of credit institutions'

performance, as given by profit rates (for example, Bikker and Hu cross-section analysis on 26 countries in the last 20 years).

Historical-economic literature tends to largely confirm such hypotheses referring to specific events and business cases (single financial institutions, banking crises, etc.). Findings suggest that banking systems are characterized by various degrees of pro-cyclicality depending on functional specialization patterns chosen by intermediaries. In this sense, despecialized banking systems would be subject to cyclical fluctuations and to the worsening of firms' financial position more often than specialized ones, therefore requiring monetary authorities to adopt expansive policies to preserve macroeconomic stability. In the Italian case, such a macroeconomic constraint would explain great banks bail-outs in the 1930s and the banking system reform culminated in the Bank Act of 1936 (Toniolo, 1978 & 1993; de Cecco, 1997).

According to historiography, Italian universal banks showed strong pro-cyclical behaviour in the 1890s-1930s period (Confalonieri, 1974, 1982 and 1994). The 1930s crisis is a major example of that: when the economy slowed down while monetary restriction policies were being adopted, universal banks reduced their loans to firms (in which they often held participations or even had gained control), thus causing negative effects on capital accumulation (Ferri, 1994). The mid-1930s banking system reform would have reduced pro-cyclicality, thanks to the introduction of specialization in credit supply (Cotula, 1999).

The paper aims to verify pro-cyclicality of the Italian banking system in the long run, from 1896 to 1975, adopting a quantitative approach. The analysis considers both the banking system (as a whole and in its different components: commercial banks, savings banks, cooperative/not-for-profit banks, and bank-like institutions), and the five largest banks ranked by total assets (the only indicator available on such a long series). We collected balance sheets figures from two different databases realized by the Bank of Italy, reclassified to obtain homogeneous data (Cotula et al., 1996; Banca d'Italia, *Bollettino bimestrale*, 1937-1975). As for macroeconomic variables (GDP and GDP per capita, and investments – as a whole and by sector) we use historical series provided by Rossi, Sorgato and Toniolo (1993) (see also Ardeni & Gallegati, 1994). Unfortunately, available data do not allow us to employ methodologies such as the 'institutional memory hypothesis' (Berger & Udell, 2002) or to follow commonly used approaches based on loan loss provisions and bad debts data (for example, Quagliariello, 2006). Indeed, the lack of information on interest rates applied to different borrowers (by size, sector, technology, ownership, etc.) and on non-performing loans compelled us to employ rougher indicators: profitability, as a proxy of bank screening capability; total assets, as a proxy of credit supply; asset composition, to better control for credit crunch; and bank survival. The analysis also takes into account temporal lags usually recorded between banks' operations and growth/depression phases.

Such a long term quantitative analysis (about 70 years) is the first attempt to verify the banking systems pro-cyclicality hypothesis for a European late comer country. Moreover, this approach will permit us to check whether universal banks are more sensitive to business cycle fluctuations than other intermediaries, both in the sense that they strongly amplify business cycle effects (if monetary authorities fail to provide stabilization policies) and that they react more than other credit intermediaries to stagnation and recession phases, as stated by some scholars who emphasize the counter-cyclical behaviour of savings institutions as compared to pro-cyclical universal banks (De Mattia, 1990). Eventually, we try to verify whether the whole banking system was more pro-cyclical before 1936 than after the banking reform, and if banks' behaviour anticipated or followed variations in the most relevant economic indicators considered. That may shed light on whether, and to what extent, the 1936 Bank Act contributed to the reduction of bank pro-cyclicality effects on Italian economic growth capabilities.

IV/E Business Productivity

Chair: **Valerio Cerretano** (Bolzen/Bolzano)

Gil Montant (Caen)

Northern French coal companies' performances in 1935-45: a panel data analysis

This analysis is about Nord-Pas-de-Calais (NPC) coal firms during the years 1935-45. During the interwar period, the NPC coal basin was the main one in France. The fact that France has never been self-sufficient in coal mineral reinforced NPC's strategic importance. The French government encouraged Northern collieries to reinforce collusion on a regional level in order to resist foreign pressure so that during the thirties, coal companies evolved through collusive strategies. During the second part of the thirties French government's intervention in NPC collieries was reinforced by laws introduced on 18 and 19 August 1936 that introduced a control on coal prices. The law of 11 July 1938 on war-time economy reinforced the State's presence on the economic level. Government's intervention in Northern coal companies was due to the necessity for the national war industry to obtain coal mineral mainly from domestic basins. A decree, dated 4 October 1939, caused coal firms to lose their ability to sell their own product. Government's presence inside collieries was confirmed during the beginning of the 1940s through various decrees.

Through this econometric analysis, we try to respond to the following two questions: (i) Despite the laws of August 1936 on coal prices, were Northern collieries still maximizing profit firms? (ii) Did the introduction of the decree on war economy induce a significant change in NPC coal companies' behaviour?

We test the hypothesis that NPC coal companies operated inside a competitive environment until October 1939 – in the sense that firms maximized their profits – after which they were not able to freely pursue such an objective due to the State's presence inside the coal industry.

The statistical material used is an annual panel data sample of 10 firms corresponding to nearly 70 per cent of the NPC basin's production. These data have been collected through personal searches developed in Northern France's archives, namely *Centre des Archives du Monde du Travail* and *Centre Historique Minier*. Annual individual profit data have been obtained from companies' annual balance sheets. Our panel data sample allows us to shed light on the main determinants of NPC firms' profits. We base our analysis on theoretical results derived from Industrial Organisation (I. O.) models based on the profit-maximizing hypothesis. We consider also different annual indexes (excess production capacity; individual market share; import index; etc.). The general specification of the model considered is given below:

$$\text{PROFIT} = f(\text{CAPA}, \text{PARTIND}, \text{QHINDIV}, \text{CONJ}, \text{QHLORR}, \text{TIME}, \text{PE}, \text{DUMMIES})$$

With PROFIT: Individual profits; CAPA: Excess capacity of NPC's coal production; PARTIND: Individual market shares; QHINDIV: Individual coal production; CONJ: French industrial production; QHLORR: Coal production from *Lorraine* coal-basin; TIME: time trend; PE: Imports of coal, coke and briquettes; DUMMIES: various binary variables.

First, we estimate from 1935 to 1945 a model in which annual individual profits data are explained by various variables mentioned above and two dummies DUM3538 et DUM3539 respectively equal to one during the periods 1939-45 and 1940-45. These dummies are introduced in order to consider a possible change in October 1939.¹ Estimates on various specifications show that binary variables differ significantly from zero so that there exists a change in 1938-39. Next, we consider two sub-periods around 1938-39. In the 1935-38 sub-period, various specifications of the model are estimated. A similar approach is performed in 1939-45. By comparing estimates obtained in the two sub-periods, we show that the sign of coefficients associated with several variables (CONJ, PE, CAPAIND) are reversed from one period to the second one. Interpretation of each estimate permits us to show that in spite of the laws of 18 and 19 August 1936, Northern French coal companies

¹ Note that data considered in the econometric analysis are yearly data.

operated in a competitive economy in the first sub-period while after 1939 they operated inside a planned environment. A significant change in NPC firms' strategic behaviour can be highlighted between ex ante and ex post periods.

Takashi Hirao (Tokyo University of Science, Suwa)

The invention of tradition: corporate paternalism at the Wills Branch of Imperial Tobacco Company

Hobsbawm and Ranger, in their book, *The Invention of Tradition*, showed that what we believe as tradition could have no continuity with its past, be deliberately invented, and largely factious. They defined invented tradition as follows: "Invented tradition" is taken to mean a set of practices, normally governed by overtly or tacitly accepted rules and/or a ritual or symbolic nature, which seek to inculcate certain values and norms of behavior by reputation, which automatically implies continuity with the past.' (p.1)

They also discussed about when tradition was invented. They indicated that: 'in short, they are responses to novel situations which take the form of reference to old situations, or which establish their own past by quasi-obligatory repetition.' (p.2). They regarded invented tradition as a process of formalization and re-utilization characterized by reference to the past.

This paper aims to expand our understanding of invention of tradition by identifying the mechanisms by which tradition is invented and accepted as such. Particularly, it examines how tradition is invented and accepted through the interaction of various actors when there is no central figure of inventing tradition. According to Hobsbawm, the most clearly exemplified 'tradition' is deliberately invented and constructed by a single initiator, as mentioned in the Boy Scouts by Baden Powell.

Therefore the purpose of this study is to examine when and how the idea about the traditional labour practice of paternalism was invented as corporate culture at the Wills Branch of Imperial Tobacco Company Ltd.

It is generally understood that paternalism in British industry disappeared with the rise of the modern firm in the late nineteenth century. There are many reasons why paternalism ended, mainly the expansion of administrative organization, the decay of family ownership, and the loss of the strong ties between employer and employee deriving from the master-servant relationship. However, what is discussed here is how paternalism was reconstructed in modern industrial relations. Where new industrial relations caused the loss of old authority, uncertainty and unrest between employees could arise. Therefore legitimating new authority became essential for the stabilization of such industrial relations. In this respect, paternalism could be invented as a tradition by salaried, professional managers, who, as a new class, needed to justify their exercising authority in order to reorganize industrial relations without any conflict. In short, paternalism was a managerial ideology for modern labour policy.

Indeed salaried, professional managers who replaced the Wills family after the First World War could allay their workers' anxiety about the new authority by making a claim on traditional rule with reminiscent statements, ('our House' or 'a Happy Family', in the house magazine, *Wills's Works Magazine*, published in 1922). This publication was almost simultaneous with these changes in the managerial structure and with the introduction of the various welfare schemes, the membership of which the new managers restricted to the Wills Branch (instead of the whole ITC). Therefore the welfare schemes at the Wills Branch were carried out as labour policy to embody the corporate culture, which professional, salaried managers invented as paternalism by making a claim on the traditional labour practice of the former firm, W.D. & H.O. Wills Ltd.

IV/F Social Mobility in the Long Term

Chair: **Matthias Morys** (Oxford)

Jesper Roine (Stockholm School of Economics) & **Daniel Waldenström** (Research Institute of Industrial Economics)

The evolution of top incomes in an egalitarian society: Sweden, 1903-2004

This study presents a new homogenous series of top income shares in Sweden over the period 1903-2004. We find that, starting from levels of inequality approximately equal to those in other Western countries at the time, the income share of the Swedish top decile drops sharply over the first 80 years of the twentieth century. Most of the decrease takes place before the expansion of the welfare state and by 1950 Swedish top income shares were already lower than in other countries. The fall is almost entirely due to a dramatic drop in the top percentile explained mostly by decreases in capital income, while the lower half of the top decile – consisting mainly of wage earners – experiences virtually no change over this period. In the past decades top income shares evolve very differently depending on whether capital gains are included or not. When included, Sweden's experience resembles that in the US and the UK with sharp increases in top incomes. Excluding capital gains, Sweden looks more like the continental European countries where top income shares have remained relatively constant. A possible interpretation of our results is that Sweden over the past 20 years has been a country where it is more important to make the right financial investments than to earn a lot to become rich.

Jason Long (Colby College)

Social mobility within and across generations in Britain since 1851

The degree of socioeconomic mobility in a labour market has important implications for economic efficiency and for economic equality. Social and occupational rigidities hinder the efficient allocation of labour and exacerbate inequalities in the distribution of earnings, wealth, education, and other social indicators. The empirical analysis of mobility from a historical perspective has been limited by the availability of appropriate data; economic historians typically lack the sort of longitudinal or survey data used by modern economists and sociologists to study mobility. Existing studies of mobility in nineteenth-century England rely on data from marriage registries, which are subject to some serious limitations. The most serious is the 'snapshot' problem: in observing father and son's occupation at one point in time, when the son is typically a relatively young adult, it is doubtful that one observes true occupational mobility over the course of two generations. It is quite likely that many sons would have changed job and social class after marriage and that upward mobility would dominate downward as sons gained skills and experience. Mobility measures derived from marriage registries would therefore be likely to underestimate the true degree of intergenerational mobility, with estimates of upward mobility being particularly downward biased. Related to this is the other fundamental and serious limitation of the marriage registries as a source: they offer no information at all on intragenerational mobility, that is, mobility over the course of the individual's work life.

I address these problems by using a rich new data source to measure both inter- and intragenerational social mobility in nineteenth-century England and Wales. With information on more than 54,000 males from three generations, linked across three censuses from 1851 to 1901, it is possible to observe social mobility along two dimensions: (1) across generations from 1851 to 1881 and from 1881 to 1901, controlling for life-cycle effects in both cases, and (2) within a generation from 1851 to 1881. Results from these data are then compared with results generated from a parallel linked census dataset from the US from 1850 to 1880 and with results generated from British data collected in 1972. I find that the rate of intragenerational mobility in Britain from 1851 to 1881 was substantial: 44 per cent of males in their twenties changed occupational class over the period. For this reason, previous estimates of intergenerational mobility are significantly too low. Half, rather than a third, of sons ended up in a different class than their father, and 27 rather than 19 per cent

moved up. If mobility in Britain was greater than previously believed, still it was significantly lower than in 1970 and lower than in the US in the nineteenth century. From the nineteenth century, however, Britain and the US have moved in opposite directions, with mobility increasing in Britain and dramatically decreasing in the US.

Alastair Owens, Claire Swan (Queen Mary, London), **David R Green** (King's London) **Josephine Maltby** (York) & **Janette Rutterford** (Open)

The final balance: death, wealth and geography in England and Wales, 1870-1903

This paper presents the findings of a major study of personal asset holding and indebtedness in England and Wales between 1870-1903 (part of a larger ESRC sponsored research programme on women and investment in Britain, 1870-1930). Drawing upon evidence from estate duty accounts, the paper will explore two main issues. First, what was the structure and composition of men's and women's assets at the point of their death and how did this change over the period? This section will explore the variety of types of wealth, including investment in the financial markets, money held as cash, personal property and real estate. It will explore how these portfolios altered over time in the context of changing legal and economic circumstances. A particular concern is to consider the differences in the composition of men's and women's estates in order to assess questions relating to gender, risk and economic agency. Secondly, it will examine the regional composition of different types of wealth holding, focusing on the contrasts between major towns and cities, and comparing London with the rest of the country. The findings add a new level of detail and understanding to existing studies of wealth holding in Victorian Britain and provide important insights into the social extent of engagement with financial markets and credit relations. In particular, they offer new evidence of the financial and economic position of women during a period of important legal and institutional change.

Economic History Society Annual Conference

28 – 30 March 2008

University of Nottingham

Call for Academic Papers

The 2008 annual conference of the Economic History Society will be hosted by the University of Nottingham from 28 to 30 March.

The conference programme committee welcomes proposals in all aspects of economic and social history covering a wide range of periods and countries, and particularly welcomes papers of an interdisciplinary nature. Preference may be given to scholars who did not present a paper at the previous year's conference. Those currently studying for a PhD should submit a proposal to the New Researcher session; please contact Maureen Galbraith (ehsocsec@arts.gla.ac.uk) for further information.

The committee invites proposals for individual papers, as well as for entire sessions (3 speakers, 1.5 hours duration). The latter should include proposals and synopses for each paper in the session, although the committee reserves the right to determine which papers will be presented in the session if it is accepted. If a session is not accepted, the committee may incorporate one or more of the proposed papers into other panels.

For each proposed paper, please send (preferably by e-mail) a brief c.v. and a short abstract (including name, postal and e-mail addresses) of 400-500 words to:

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For full consideration, proposals must be received by 17 September 2007. Notices of acceptance will be sent to individual paper givers by 16 November 2007.

Should your paper be accepted, you will be asked to provide the following:

- A brief non-technical summary of your paper for the 'Media Briefings' section of the Society's website (by 4 January 2008).
- An abstract of the paper for inclusion in the conference booklet (by 4 January 2008).
- An electronic copy of your full paper, or a web address where the paper is available for consultation (by 3 March 2008).

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 (ehsocsec@arts.gla.ac.uk). It is important that a completed application form is included with the paper proposal and the brief c.v. which are submitted to the conference committee for the September deadline. Only in exceptional circumstances will later applications for support be considered.

Economic History Society Annual Conference

28 – 30 March 2008

University of Nottingham

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The annual conference opens with papers presented by new researchers. They offer those completing doctorates the opportunity to present their work before professional colleagues and to benefit from informed comment.

The session will be held on the afternoon of Friday 28 March 2008. Those wishing to be considered for inclusion in the programme at Nottingham must submit a synopsis by 3 September 2007. This should provide a firm title, a succinct summary of the principal themes and methodology of the paper, and an outline of probable conclusions.

The synopsis should be of not more than 500 words. It must be accompanied by a clear statement of the progress of research, intended date for submission of thesis, and a statement of support from the supervisor. 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 4 January 2008 for circulation in the conference booklet. Each new researcher will have the opportunity to speak for twenty minutes, followed by ten minutes of discussion. Two prizes of £250 will be awarded for the best papers presented at the Conference by new researchers. The procedure for judging papers will be circulated to all participants.

The Economic History Society is able to offer limited financial support to enable new researchers to attend the Conference when this is not available from their institution.

Synopses, in MSWord, (including name, affiliation, postal and e-mail addresses) and any enquiries should be directed (preferably by e-mail) to:

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