Trade and Protectionism in Interwar Germany

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When the Great Depression hit Germany in 1929 and international trade collapsed at an unprecedented pace, the government of the Weimar Republic also experienced a paradigm shift in trade policy. While previous governments had set Germany on a course of reconciliation with its neighbours, both economically and politically, trade policy now became a weapon to protect the domestic economy from falling world prices at all costs. Tariffs skyrocketed over the course of the crisis. And while Germany became less reliant on imports from major Western trading partners, imports from Southeastern Europe and Latin America began to play an increasingly important role.

Germany was not alone in experiencing a simultaneous increase in protectionism and sharp decline in trade, but to what extent one caused the other remains debated in the literature. Some have suggested that the tendency to re-orient trade relations into blocs such as the British Empire and the Reichsmark bloc in Southeastern Europe were not due to policy shifts but the result of endogenous trends.[1] More recently, de Bromhead et al.[2] have taken a new approach to the analysis of trade flows and policy by going beyond aggregate measures and looking at how the trade policy shift occurred at the good-times-country level. By constructing a data set of hundreds of goods and dozens of countries, they are able to show, based on a computable general equilibrium (CGE) analysis, that imperial preference contributed much more to the balkanization of British trade in the 1930s than the aggregate data suggests.

In this paper, I employ their methodology to Germany in the interwar period. I construct a new data set of annual imports of 535 goods from 50 countries. I estimate elasticities of substitution for these varieties and then use them in a CGE model. I find a large effect of tariffs and quotas on the total value of German imports, although it only explains a minority of the total trade collapse. Imports declined by more than 17 per cent by 1933 compared to a counterfactual with tariffs frozen at their 1929 level. However, I find no positive effect on the share of Reichsmark bloc countries in total imports. Despite the use of preferential rates, tariffs did not contribute to the geographical shift towards Southeastern Europe and Latin America.

German Trade Policy in the Interwar Period

German tariffs remained relatively stable from the 1925 tariff reform to the onset of the Great Depression. Tariffs were only moderately high at this point in comparison to other countries (see Eichengreen and Irwin[3]). Agricultural tariffs on grain and meat that had been set to a temporarily lower level rose slightly in 1926, while tariffs on automobiles were set to decrease several points.

Tariff changes before 1929 were mostly the result of new trade treaties and tended to lower rates, such as in the case of the 1927 trade treaty with France.[4] The year 1930 constituted a paradigm shift in this regard. Tariffs rose sharply after that, at first primarily in agriculture. In a series of 18 ministerial decrees between January 1932 and the appointment of Hitler to the

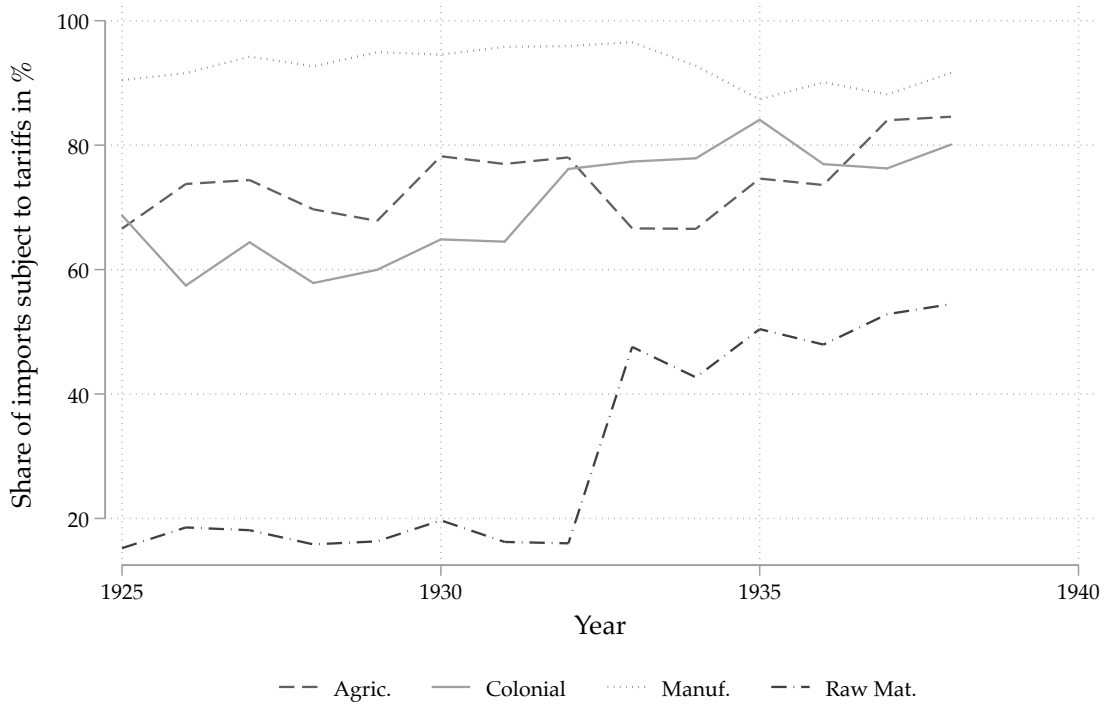
[1] B. Eichengreen and D. A. Irwin, 'Trade blocs, currency blocs and the reorientation of world trade in the 1930s,' Journal of International Economics 38, no. 1 (1995): 1–24; N. Wolf and A. O. Ritschl, 'Endogeneity of Currency Areas and Trade Blocs: Evidence from a Natural Experiment,' Kyklos 64, no. 2 (2011): 291–312.
[2] de Bromhead et al., 'When Britain turned inward: the impact of interwar British protection.'
[3] B. Eichengreen and D. A. Irwin, 'The slide to protectionism in the Great Depression: Who succumbed and why?,' The Journal of Economic History 70, no. 4 (2010): 871–897.
[4] United States Tariff Commission, Foreign-trade and exchange controls in Germany: A report on the methods and policies of German foreign-trade control (Washington, D.C.: U.S. Govt. Print. Off., 1943), 40.

chancellorship in January 1933, 225 further tariff increases were introduced.[5] Industrial duties also increased, albeit not as much and mostly as a result of falling prices. The German duties were almost all set as specific rates rather than ad valorem. When world prices began to fall during the Depression, relative rates therefore began to increase even without any government interference.[6]

I have reconstructed tariffs based on the official German legislative publication, the *Reichsgesetzblatt*, amended with information from the *Tariff Handbook for the German Reich*.[7] I began with typing up the tariffs listed in the first edition of the Tariff Handbook, published in 1925. I then adjusted the tariff rates based on each announcement in the *Reichsgesetzblatt*, both for autonomous tariff changes and new trade treaties that led to changes in the MFN rates. Two further editions of the Tariff Handbook, published in 1928 and 1938, allowed me to cross-check rates and ensure I did not miss any changes.

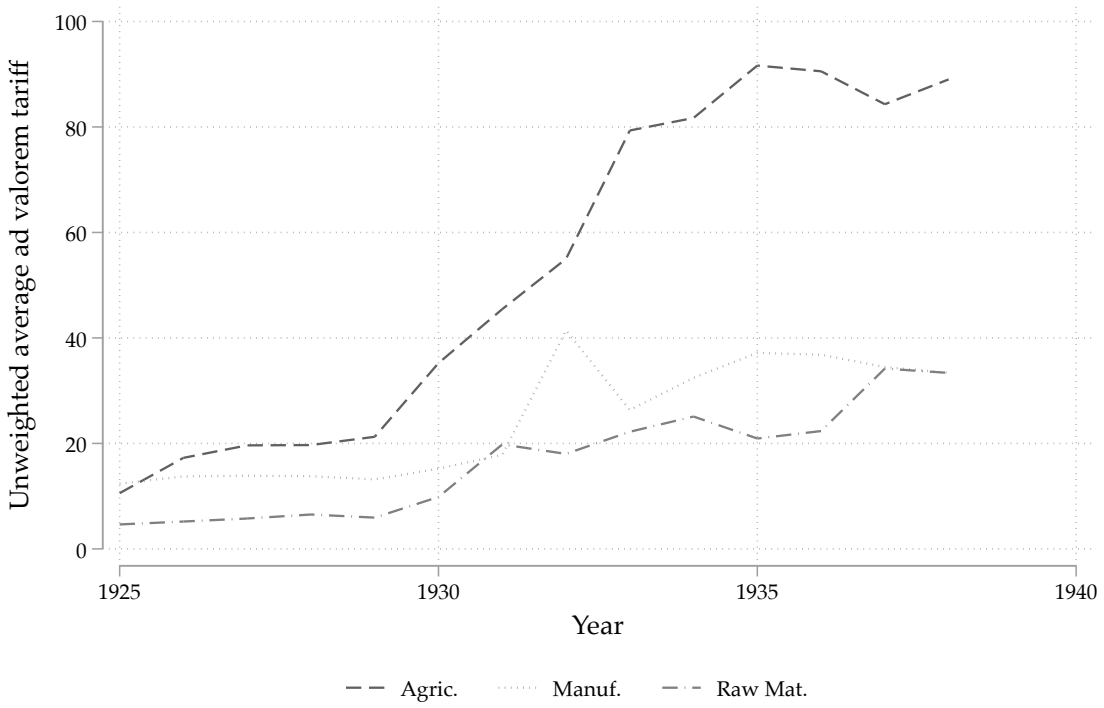
Figure 1 shows the share of German imports in my sample that was subject to tariffs over time, separated into four broad categories. Figure 2 shows the unweighted average ad valorem equivalent tariff calculated based on the value and volume of trade and the specific tariff rates from German legislative documents. In addition to tariffs, I include various other trade policy measures in the subsequent analysis. I control for quotas on British coal and Hungarian livestock, veterinary bans of meat imports, international cartel agreements, trade treaties with special provisions for imports, and different forms of clearing agreements.

Figure 1: Share of imports subject to tariffs in the trade data sample



[5] Ibid., 41.
[6] Ibid., 42.
[7] Reichsministerium des Innern, ed., Reichsgesetzblatt, 1925–1939; O. Lang, Zollhandbuch für das Deutsche Reich (Berlin: Reimar Hobbing, 1925–1939).

Figure 2: Average ad valorem equivalent tariff rate in the sample



Trade Data

The trade data I use is based on various publications of the Reich Statistical Office (*Statistisches Reichsamt*): *Der auswärtige Handel Deutschlands im Jahre 1927-1929* and the December volumes of *Monatliche Nachweise über den auswärtigen Handel Deutschlands 1930-1938*.[8] I am using a sample of 586 products imported from 48 countries and territories over a period of 14 years from 1925 to 1938. The classification of trade was not always consistent over this period in all categories: some categories were dropped in later years and new categories appeared at various points in time. I therefore needed to aggregate up some of them, resulting in 535 consistent products categories from 42 countries over the whole period.

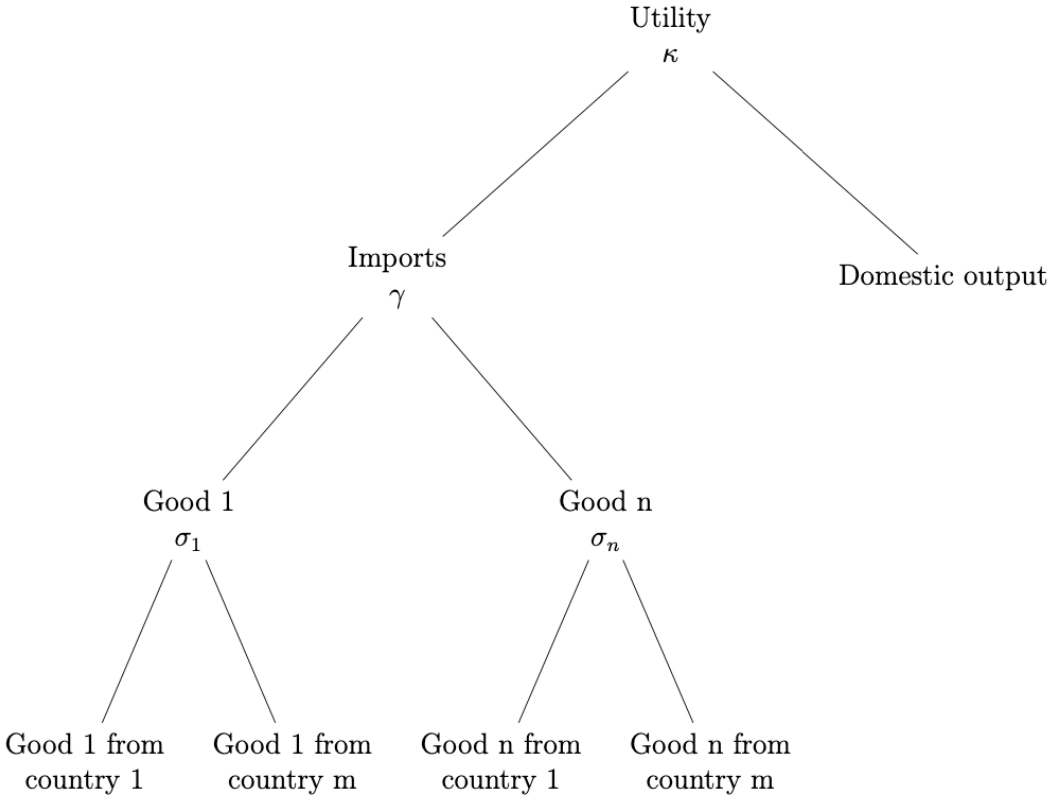
Theoretical Framework

I use the same notation as de Bromhead et al.[9]: a nested constant elasticity of substitution (CES) utility function, illustrated in figure 3. The domestic consumer makes three decisions in this model: first of all, whether to import or consume a domestic good. κ is the elasticity of substitution between importing and consuming domestic goods. Secondly, the consumer has a choice between different goods to consume. The total import value therefore depends on the composition of the bundle of all goods $g \in G_t$, the set of all imported goods at time t. The functional form is again CES, where γ is the elasticity of substitution between these goods. Finally, the consumer can choose between different import sources for every imported good, out of the subset $I_{gt} \subset C$ of countries supplying good g to Germany in year t. σ_g is the elasticity of substitution between two different varieties of the same product category from different countries.

[8] Statistisches Reichsamt, Der Auswärtige Handel Deutschlands in den Jahren 1925-27 (Reimar Hobbing, 1928); Der Auswärtige Handel Deutschlands im Jahr 1929 (Reimar Hobbing, 1930); Monatliche Nachweise über den auswärtigen Handel Deutschlands (Reimar Hobbing, 1930–1939).
[9] de Bromhead et al., 'When Britain turned inward'.

These three functions together define the demand side of the framework. In order to simulate the model, I need to first estimate the elasticities: σ_g for each of the 535 goods, γ, and κ.

Figure 3: Nested CES utility function



Estimating the elasticities

I use the structural gravity equations from Anderson[10] to estimate the elasticities of substitution for the choice between goods from different countries, the σ_g for each of the 535 goods. Because the sample size for most of the product categories would be too small. I divide all goods into nine broader categories, for which I then estimate σ_h. This assumes that the elasticity of substitution will be the same within each of these nine categories. After some rearrangement I use the equation

$$\ln(V_{gct}^{W}) = \ln(GDP_{ct}) + \ln(E_{ct}) - \sigma_h \Sigma(\ln(b_i)\delta_{icgt}) + d_{gt} + d_{gc} + u_{gct}.$$

V_{gct}^{W} is the value of trade at world prices. t_{gct} is the tariff rate and b_i and δ_{icgt} are variables for other trade policy measures. E_{ct} is the exchange rate and d_{gt} and d_{gc} are fixed effects.

Table 1 shows the results of the regressions. I use a Poisson pseudo-maximum likelihood (PPML) estimator with a log-linear equation. Seven out of nine categories have the expected negative sign indicating that an increase in the tariff was associated with a decrease in trade. However, only two of those, grain and animal products, are significantly different from zero.

[10] J. E. Anderson and Y. V. Yotov, 'The changing incidence of geography,' American Economic Review 100, no. 5 (2010): 2157–86.

Table 1 PPML estimation results

VARIABLES	(1) Total	(2) Grain	(3) Animal	(4) Mach.	(5) Minerals	(6) Textiles	(7) Misc. Inputs	(8) Miscindustr.	(9) Food Oils	(10) Colonial
Log(1+Tariff)	**-0.766**	**-1.356**	**-0.622**	**0.122**	**0.214**	**-0.153**	**-0.373**	**-3.296**	**-7.633**	**0.101**
	(0.262)	**(0.458)**	**(0.620)**	**(0.398)**	**(0.593)**	**(0.430)**	**(0.132)**	**(1.440)**	**(4.655)**	**(0.863)**
TreatyCountry	0.162	0.0388	0.312	0.189	0.215	0.310	0.0407	-0.474	0.192	0.0626
	(0.121)	(0.461)	(0.209)	(0.089)	(0.383)	(0.158)	(0.190)	(0.180)	(0.124)	(0.144)
Treaty Good	0.545	0.594	0.502	0.0288	0.585	-1.509	-0.945	1.173	2.389	-0.266
	(0.265)	(0.760)	(0.243)	(0.138)	(0.477)	(0.351)	(0.459)	(0.269)	(0.866)	(1.054)
Log(GDP)	1.103	1.201	0.528	1.283	0.537	0.205	1.995	2.367	-0.114	0.242
	(0.475)	(0.666)	(0.932)	(0.434)	(0.942)	(1.072)	(0.986)	(0.500)	(1.150)	(0.321)
Log(Ex. Rate)	-0.042	0.0604	-0.022	0.640	-0.280	0.0878	-0.199	0.142	-0.003	-0.017
	(0.024)	(0.089)	(0.015)	(0.372)	(0.215)	(0.110)	(0.131)	(0.187)	(0.168)	(0.116)
Clearing Agr.	0.308	0.303	-0.006	0.664	0.286	0.0672	0.264	0.791	0.306	0.612
	(0.131)	(0.265)	(0.152)	(0.172)	(0.280)	(0.537)	(0.251)	(0.188)	(0.272)	(0.146)
Quota	-0.355				-0.537					
	(0.235)				(0.222)					
Comp. Agr.	-0.062						-0.238			0.0666
	(0.178)						(0.309)			(0.114)
Cartel	0.228			-0.181	0.349	-0.647				-0.350
	(0.116)			(0.099)	(0.139)	(1.015)				(0.800)
Constant	-1.564	-1.671	4.823	-7.993	3.347	5.827	-10.68	-18.65	11.64	7.815
	(4.876)	(6.878)	(8.735)	(4.595)	(10.16)	(11.24)	(10.31)	(5.748)	(12.14)	(2.813)
Observations	88,956	2,238	2,969	27,533	10,319	16,291	18,294	3,454	4,910	2,393

Robust standard errors in parentheses

In order to estimate γ, I can make use of the first-stage results from the estimation of the σ_hs. I can use these results to calculate the CES quantity M_{gt} and corresponding prices p_{Mgt} for the 535 products and 14 years in my sample. I use bootstrapping to repeatedly estimate the σ_h values based on equation 11 with new subsamples from the data, constructing values for M_{gt} and P_{Mgt} and then estimating γ. This procedure gives me an estimated mean for γ of 0.770 with a standard error of 0.286.

Finally, I am interested in the value of κ, the elasticity of substitution between imported and domestic goods. I use an Ordinary Least Squares regression, in which I regress total imports in a year divided by total expenditure on the unweighted average tariff using aggregate data from Ritschl and Spoerer[11] and Fremdling and Staeglin.[12] The resulting estimate for κ is a coefficient of 1.169 with a standard error of 0.245.

Counterfactual scenarios

I can now use the elasticities to simulate counterfactual scenarios and see what would have happened to the German imports if trade policy had remained constant in the Great

[11] A. Ritschl and M. Spoerer, 'Das Bruttosozialprodukt in Deutschland nach den amtlichen Volkseinkommens- und Sozialproduktsstatistiken 1901-1995,' Jahrbuch für Wirtschaftsgeschichte 38, no. 2 (1997): 27–54.

[12] R. Fremdling and R. Staeglin, 'Output, national income, and expenditure: an input– output table of Germany in 1936,' European Review of Economic History 18, no. 4 (2014): 371–397.

Depression. I choose 1929 as the last year of moderate trade policy. I calibrate a CGE model based on the disaggregated import data and policy parameters. Then I freeze all tariffs at their 1929 value and run the model again, using the elasticities that I previously estimated. To account for the fact that elasticities are econometrically estimated, I draw 1000 values for each of them from normal distributions with the previously estimated means and standard errors. Based on these 1000 values, I run the model 1000 times and receive a distribution of counterfactual scenarios.

Figure 4: Counterfactual simulation for total import value

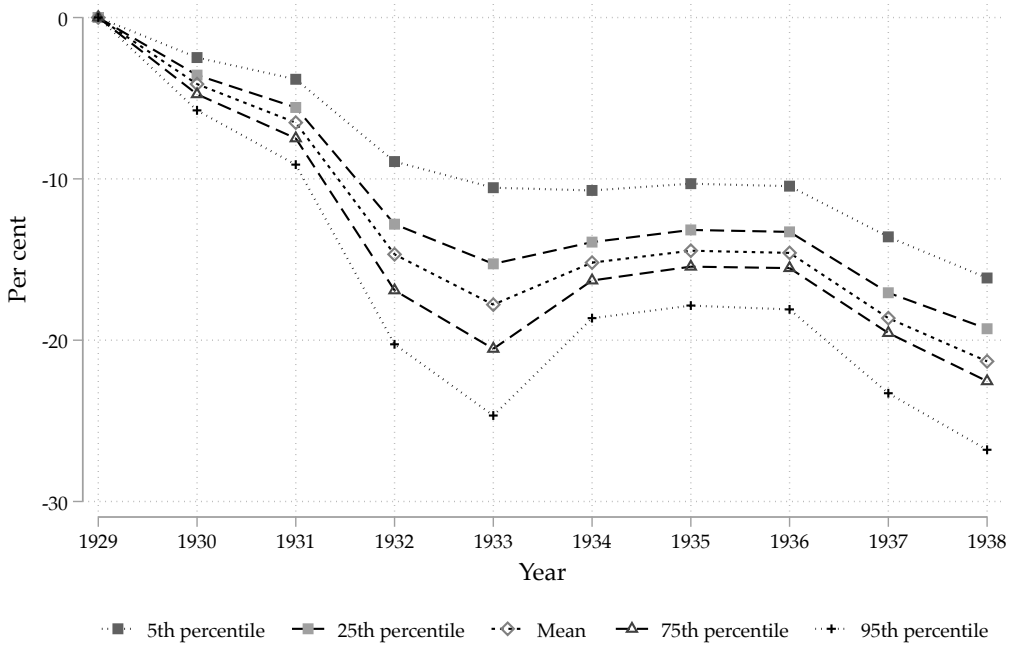
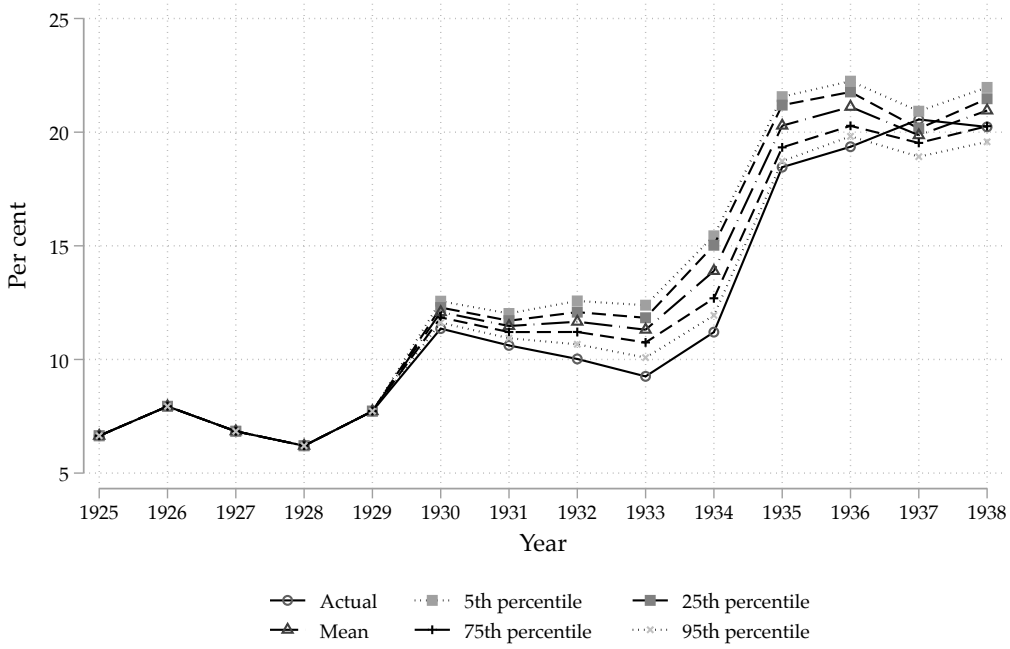


Figure 5: Counterfactual simulation for share of trade bloc



Graph 4 shows the results of the CGE analysis. It depicts the relative difference in per cent between the real import values and the simulated import values with frozen 1929 tariffs and quotas. The increase in tariffs and quotas in the 1930s reduced the German value of imports by, on average, 17.8 per cent until the year 1933, with a 95 per cent confidence interval between

10.5 and 24.7 per cent. As the German economy began to recover but imports remained low, this effect kept growing to 21.3 per cent in 1938 (confidence interval between 16.1 and 26.8 per cent. While these confidence intervals are very wide, the effect even at the lower bound is very big. However, in the context of the Great Depression, such a decline is not big enough to explain a majority of Germany's trade decline. The value of imports fell from 14.228 billion Reichsmark at its high point in 1927 to 4.204 billion Reichsmark in 1933. Further disaggregation shows that this impact of trade policy on total trade was entirely concentrated in the categories of food, consumer goods, and fuel, while there was no significant impact on industrial imports.

Graph 5 shows what effect the tariff shifts had on the increase in the share of the Reichsmark bloc countries in German imports. The answer, in short, is none. While Germany introduced some preferential tariffs for the countries of Southeastern Europe, these seem to not have made up for the enormous increase in agricultural tariffs. Since agriculture and raw materials made up the lion's share of imports from the bloc countries, trade policy changes in these sectors hit them especially hard. The simulation results suggest that with tariffs and quotas frozen at their 1929 level, trade with the Reichsmark bloc would have constituted a slightly lower share of overall German imports than under the protectionist policies of the 1930s. There is a significant effect on only the strategically important goods (agriculture and raw materials) but even that is relatively small.

Literature

Anderson, J. E., and Y. V. Yotov. 'The changing incidence of geography.' *American Economic Review* 100, no. 5 (2010): 2157–86.

de Bromhead, A., A. Fernihough, M. Lampe, and K. H. O'Rourke. 'When Britain turned inward: the impact of interwar British protection.' American Economic Review 109, no. 2 (2019): 325–52.

Eichengreen, B., and D. A. Irwin. 'The slide to protectionism in the Great Depression: Who succumbed and why?' *The Journal of Economic History* 70, no. 4 (2010): 871–897.

Fremdling, R., and R. Staeglin. 'Output, national income, and expenditure: an input–output table of Germany in 1936.' *European Review of Economic History* 18, no. 4 (2014): 371–397.

Lang, O. Zollhandbuch für das Deutsche Reich. Berlin: Reimar Hobbing, 1925– 1939.

Reichsministerium des Innern, ed. Reichsgesetzblatt, 1925–1939.

Ritschl, A., and M. Spoerer. 'Das Bruttosozialprodukt in Deutschland nach den amtlichen Volkseinkommens-und Sozialproduktsstatistiken 1901-1995.' *Jahrbuch für Wirtschaftsgeschichte* 38, no. 2 (1997): 27–54.

Statistisches Reichsamt. *Der Auswärtige Handel Deutschlands im Jahr 1929*. Reimar Hobbing, 1930.

---. *Der Auswärtige Handel Deutschlands in den Jahren 1925-27.* Reimar Hobbing, 1928.

---. *Monatliche Nachweise über den auswärtigen Handel Deutschlands*. Reimar Hobbing, 1930–1939.

---. *Statistisches Jahrbuch für das Deutsche Reich*. 1925–1939.

United States Tariff Commission. *Foreign-trade and exchange controls in Germany: A report on the methods and policies of German foreign-trade control*. Washington, D.C.: U.S. Govt. Print. Off., 1943.

Wolf, N., and A. O. Ritschl. 'Endogeneity of Currency Areas and Trade Blocs: Evidence from a Natural Experiment.' *Kyklos* 64, no. 2 (2011): 291–312.