Trade and Protectionism in Interwar Germany

Alexander A. J. Wulfers

St John's College

University of Oxford

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Abstract

Germany's trade policy underwent many paradigm shifts throughout its modern history, but none were as dramatic as the year 1930 when, at the height of the Great Depression, the German government abandoned a policy of moderate free trade and re-integration in the world economy to set Germany on a path towards autarky. This dissertation takes advantage of newly transcribed, highly disaggregated data on the structure of German interwar trade to investigate questions related to the causes and consequences of this paradigm shift.

I first use socioeconomic data at the district level combined with electoral data to show that Germans' voting intentions were well-aligned with their trade policy preferences. The correlation between trade exposure and votes for protectionist parties became stronger over time, both within the agricultural sector and between different industries.

I then use data on the universe of German trade to investigate the structure of the interwar trade collapse and find parallels to the 2009 Great Trade Collapse and the British trade crash during the Great Depression. The decline occurred primarily at the intensive margin. Industrial goods were hit harder in the early years than consumer goods, but this correlation is reversed in later years. Trade in non-differentiated goods fell more than trade in differentiated goods. Deflation played a much bigger role in the decline of trade values than in 2009 and the crash was less geographically balanced.

Finally, I construct a computable general equilibrium model to test the impact of trade policy on imports. I find that the shift towards protectionism alone caused a decline in trade as big as the entire 2008/09 trade collapse in Germany. This shift was concentrated in three sectors: fuel, consumer goods, and food. However, trade policy mattered very little for the geographical shift towards the Reichsmark Bloc in the 1930s.

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List of Abbreviations

AA . . . . . Auswärtiges Amt (Foreign Office)

AVI . . . . . Arbeitsgemeinschaft der eisenverarbeitenden Industrie (Association of the Iron-Processing Industry)

BEA . . . . . Bureau of Economic Analysis

BVP . . . . . Bayerische Volkspartei (Bavarian People's Party)

CES . . . . . Constant Elasticity of Substitution

CGE . . . . . Computable General Equilibrium

CNBL . . . . . Christlich-Nationale Bauern- und Landvolkpartei (Christian-National Peasants' and Farmers' Party)

COVID-19 . . . Coronavirus Disease 2019

CSSR . . . . . Czechoslovak Socialist Republic

DBP . . . . . Deutsche Bauernpartei (German Farmers' Party)

DDP . . . . . Deutsche Demokratische Partei (German Democratic Party)

DNVP . . . . . Deutsche Nationale Volkspartei (German National People's Party)

DSGE . . . . . Dynamic-Stochastic General Equilibrium

DVFP . . . . . Deutschvölkische Freiheitspartei (German Völkisch Freedom Party)

DVP . . . . . Deutsche Volkspartei (German People's Party)

ERP . . . . . Effective Rate of Protection

EU . . . . . European Union

FRG . . . . . Federal Republic of Germany

FTC . . . . . Federal Trade Commission

GAMS . . . . . General Algebraic Modeling System

GDP . . . . . Gross Domestic Product

GDR . . . . . German Democratic Republic

GESIS . . . . . Leibniz Institute for the Social Sciences

GTC . . . . . Great Trade Collapse

HPA . . . . . Handelspolitischer Ausschuss (Committee for Trade Policy)

ICPSR . . . . . Inter-university Consortium for Political and Social Research

IG . . . . . Interessengemeinschaft

KPD . . . . . Kommunistische Partei Deutschlands (Communist Party of Germany)

LAB . . . . . Länderrat des Amerikanischen Besatzungsgebietes (Council of German States in the American Occupation Zone)

MFN . . . . . Most Favoured Nation

Mill. . . . . . Million

MPIDR . . . . Max Planck Institute for Demographic Research

MPSGE . . . . Mathematical Programming System for General Equilibrium

NA . . . . . Not available

NERP . . . . . New Effective Rate of Protection

NGO . . . . . Non-Governmental Organization

NSDAP . . . . Nationalsozialistische Deutsche Arbeiterpartei (National Socialist German Workers' Party)

NSFB . . . . . Nationalsozialistische Freiheitsbewegung (National Socialist Freedom Movement)

OECD . . . . . Organization for Economic Cooperation and Development

OLS . . . . . Ordinary Least Squares

PPML . . . . . Poisson Pseudo-Maximum Likelihood

RDI . . . . . Reichsverband der Deutschen Industrie (Reich Association of German Industry)

RLB . . . . . Reichslandbund (Reich Rural League)

RM . . . . . Reichsmark

RMEL . . . . . Reichsministerium für Ernährung und Landwirtschaft (Reich Ministry for Food and Agriculture)

RWM . . . . . Reichswirtschaftsministerium (Reich Economic Ministry)

SITC . . . . . Standard International Trade Classification

SPD . . . . . Sozialdemokratische Partei Deutschlands (Social Democratic Party of Germany)

UK . . . . . United Kingdom

US(A) . . . . . United States of America

USSR . . . . . Union of Soviet Socialist Republics

WTO . . . . . World Trade Organization

WWI . . . . . World War

WWII . . . . . World War II

1 Introduction

1.1 Motivation

In the spring of 1925, the famous German economist Bernhard Harms published his book *The Future of German Trade Policy*,[1] an assessment of Germany's path towards re-integration in the world economy. Ostracized from its most important trading partners after World War I, the nation was still reeling from the aftermath of war, revolution, hyperinflation, and multiple coup attempts at the time.[2] Now, after currency reform and the Dawes Plan had laid the groundwork for economic stabilization and recovery in 1924,[3] the next critical step towards re-establishing Germany on the world

1. B. Harms, *Die Zukunft der deutschen Handelspolitik im Rahmen des Neuaufbaus der deutschen Volkswirtschaft und ihrer weltwirtschaftlichen Beziehungen*, v. 1 (G. Fischer, 1925).

2. H. Winkler, *Weimar 1918 - 1933: die Geschichte der ersten deutschen Demokratie* (Beck, 1998), 109ff., 186ff.

3. A. Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy* (Penguin Books Limited, 2007), 5f.

stage was imminent: the *Reich* government was about to re-gain its ability to independently set its trade policy.[4]

Harms described the state of German trade policy at the beginning of this new era as "chaos"[5] in comparison to the pre-war tariff system. This, he argued, had to change. He stressed Germany's increased dependence on international trade as a result of lost territory and temporarily reduced productivity after the war.[6] While he considered that an initial attempt could be made to fill this gap by intensifying agriculture on the remaining land, he ultimately only saw one way out:

> If [former French Prime Minister] Clemenceau's statement that Germany's population is too high by 20 million people is not to lead to the consequences that Clemenceau assumed, Germany must continue to develop its industrialization and create the prerequisites for increasing sales of its industrial products on the world market as planned. There is no other way.[7]

The alternative to more world market integration, Harms concluded, was

> [f]orcibly pushing the population back into the available food space with the help of increased mortality rates. May a benevolent fate save the German people from experiencing such a 'transitional period'. But fate is only benevolent when it is taken into one's own hands.[8]

Ultimately, Harms argued, trade would also benefit the German peasant farmer, as "the welfare of the German peasantry is tightly linked with industry and its prospering."[9]

Around the same time, an industrious group of politicians and civil servants – including the foreign minister Gustav Stresemann, the secretary

4. The treaty of Versailles had severely limited this by requiring Germany to grant unilateral most-favoured-nation status to the victors of the war.

5. Harms, *Die Zukunft der deutschen Handelspolitik im Rahmen des Neuaufbaus der deutschen Volkswirtschaft und ihrer weltwirtschaftlichen Beziehungen*, 93.

6. Ibid., 169.

7. Ibid., 171.

8. Ibid.

9. Ibid., 182.

of state in the economics ministry Ernst Trendelenburg, and the ministerial director Hans Posse[10][11] – set out to rebuild Germany's trade relations, negotiate new trade treaties (including a groundbreaking treaty with the "hereditary enemy" France in 1927) and moderate a multitude of special interests to prevent an escalation of tariff demands – both for the benefit of Germany's dynamic manufacturing sector and the country as a whole. Stresemann, fully aware of Germany's diminished status in the political and military sphere, understood the importance of these steps in 1925 when he wrote, "I believe that today any Foreign Minister must solve the task of making foreign policy by using world economic circumstances and the one area in which we are still a Great Power – our economic power,"[12] by which he meant its strength in international trade in particular. Germany's integration into a bigger European market looked like it could mirror in the economic sphere the reconciliation of the Reich with its former enemies that Stresemann was trying to accomplish in the diplomatic sphere.

It seemed like Harms would have had much to approve of in Germany's trade policy up until 1928. Reading his book with the benefit of hindsight, however, it is hard to not see it in contrast to where German trade policy ultimately ended up: after a few years of moderation and multilateralism, the fragile consensus collapsed after 1929. The agrarian sector fell into crisis as a result of collapsing global commodity prices and the ensuing Great Depression. Facing pressure from increasingly radicalized interest groups and shrinking options due to its own compromised fiscal and monetary

10. M. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, Beiträge zur deutschen und europäischen Geschichte (Krämer, 1997), 69.

11. It is worth noting here that Hans Posse's commitment to free trade was decidedly limited. While he was instrumental in pursuing the goals of the liberal Weimar governments, he remained in his position in the RWM during the Nazi period and implemented their vision of autarky. He also envisioned an "imperialist" foreign policy as early as 1924 (E. Teichert, *Autarkie und Großraumwirtschaft in Deutschland 1930-1939: Außenwirtschaftspolitische Konzeptionen zwischen Wirtschaftskrise und Zweitem Weltkrieg*, vol. 30 (Oldenbourg, 1984), 108).

12. R. M. Spaulding, "German Trade Policy in Eastern Europe, 1890-1990: Preconditions for Applying International Trade Leverage," *International Organization* 45, no. 3 (1991): 351.

position, the German government agreed to a series of steep tariff hikes, the introduction of exchange controls, discriminatory trade barriers, and cancellations of trade treaties, until the German economy found itself in a system of barter trade and on a path towards the National Socialist dream of autarky. Retaliatory measures in other countries soon followed. Both export and import volumes fell off a cliff, not only but also because of the new barriers to the free flow of goods.

This dissertation is about the structure, causes, and consequences of this rapid decline of Germany's integration in the world economy. Who supported the protectionist turn? Which sectors were affected particularly strongly? How did the German trade collapse compare to trade collapses elsewhere? And how much did trade policy contribute to this collapse?

1.2 German Trade Policy in the Broader Context

1.2.1 An economic *Sonderweg*?

Trade barriers went up in all major economies in the 1930s but nowhere was that development more extreme than in Germany.[13] This paradigm shift in trade policy constituted one important element in how the German economic slump gave way to the rise of Hitler, inextricably linking it to the debate about whether Germany's path in modern history was somehow unique and if Germany was inherently different from other countries.

The concept of a German *Sonderweg* has been at the heart of many debates about German history over the last century. The *Sonderweg* thesis in its critical, post-1945 version, as summarised by Kocka, attempted to explain "why – in contrast to comparable, highly developed countries in the west and the north – Germany became fascist and/or totalitarian in the general crisis of

13. 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.

the 1920s and 1930s."[14] Was Germany different and, if so, what was different about it? In his seminal work on the history of Germany, Heinrich-August Winkler comes to the conclusion that

> [t]here was a "German Sonderweg." It was the long road from a country deeply influenced by the Middle Ages to modern times. The partial emancipation from the Middle Ages that Germany achieved can also be described as a partial modernization. What remained of the Middle Ages stood next to what was modern and reshaped it until the old was permeated by the new and the new by the old.[15]

While some have argued that there is no such thing as a default historical trajectory, Winkler points out that "[t]he term 'western democracies' refers to a common feature of the states from whose political development the German one stood out sharply until 1945."[16] The concept of a *Sonderweg* had emerged in the 19th century as a justification for a German political culture that was much more hierarchical than that of the nation-states of the West. However, in the aftermath of the Holocaust, its meaning underwent a radical change. The question now was whether Germany was fundamentally different from the West in a way that would explain the breakdown of civilization under Hitler. Germany's history of "revolution from above" and the enlightened absolutism of Frederick the Great implied, according to Winkler, an "inalienable stamp that excluded the Germans from the community of Western European ideals."[17]

One group that has played an important role in historians' attempt to understand Germany's trajectory was the East Elbian landowner class, the Prussian *Junkers*. They, along with the senior civil servant class and the Prussian officer corps of Bismarck's "second Reich", represented "élites of

14. J. Kocka, "German history before Hitler: The debate about the German Sonderweg," *Journal of Contemporary History* 23, no. 1 (1988): 4.

15. H. A. Winkler, *Der lange Weg nach Westen: Deutsche Geschichte vom "Dritten Reich" bis zur Wiedervereinigung*, vol. 2 (CH Beck, 2000).

16. Ibid.

17. Ibid.

pre-industrial origin", who "retained much power and influence well into the twentieth century."[18] Kocka cites Hans-Ulrich Wehler's interpretation of the *Kaiserreich* that existed between 1871 and 1914 as a society that "appeared to be a strange mixture of highly successful capitalist industrialization and socio-economic modernization on the one hand, and of surviving pre-industrial institutions, power relations and cultures on the other."[19] The upheavals of World War I and the German revolution of 1918/19 could, according to the *Sonderweg* thesis, only partially replace this ambiguous system.

Kocka[20] has called the *Sonderweg* thesis a "meaningful, though not necessarily accurate, contribution to historical understanding." The idea has since lost a lot of its influence, with Whaley writing in 2020: "It is now common to read that the *Sonderweg* is passé and it is certainly true that few current German historians espouse anything like the version of this master narrative that was current in its heyday,"[21] the 1960s and 1970s. Baranowski has argued against the idea of German exceptionalism with regards to the Prussian Junkers' role, writing that they were "not alone in demonstrating their capacity for survival and adaptation"[22] among European élites, but that their role should nonetheless not be dismissed: "East Elbian estate owners, especially the Junkers, contributed more to the devastation that characterized the first half of the twentieth century than their counterparts elsewhere."

The *Sonderweg* question has, in more recent years, found its way into the economic history literature on the Weimar Republic. Adam Tooze has argued that while accounts of National Socalism as "political religion" may be important to "sensitiz[e] us to the sheer otherness of the Third Reich", it is very difficult to understand the support the Nazis enjoyed "without reference

18. Kocka, "German history before Hitler: The debate about the German Sonderweg," 4.
19. Ibid., 5.
20. Ibid., 3.
21. J. Whaley, "Helmuth Plessner and The Delayed Nation," *Journal of European Studies* 50, no. 1 (2020): 128.
22. S. Baranowski, "East Elbian Landed Elites and Germany's Turn to Fascism: The Sonderweg Controversy Revisited," *European History Quarterly* 26, no. 2 (1996): 230.

to economic factors."[23] The field has been most prolific in its analysis of voting behaviour in this period. King et al. have pointed out that the "Nazi voting literature rarely draws on the extensive economic voting behaviour literature or on modern statistical methods" and has treated the elections of the early 1930s as "unique events and comparison with other elections as mostly irrelevant."[24] Their detailed look into the disaggregated data on Weimar elections reveals, however, that voting behaviour was decidedly "ordinary" with regards to the variables they investigate and that "the most widely accepted existing theories of this era cannot distinguish the Weimar elections from almost any others in any country." Lehmann[25] has conducted a similar analysis of the voting behaviour in the German Empire during the trade policy paradigm shifts of the 1880s and finds that economic theory predicts political alignments in questions of protectionism fairly well.

In a comparative study, de Bromhead et al. have asked whether "German Lessons Generalize" with regards to the rise of political extremism in the Great Depression. They find that political institutions (such as a minimum electoral threshold), economic deprivation, a long experience with democracy, and the outcome of World War I all helped or hindered the rise of extremist parties more generally in the interwar period, not just in Germany.[26] As Broadberry has shown, Germany certainly was structurally quite different at least from the United Kingdom with regards to productivity estimates: Interwar Germany was simultaneously a modern manufacturing economy

23. A. Tooze, "The Economic History of Nazi Germany," in *Nazi Germany*, ed. J. Caplan (2008), 168.

24. G. King et al., "Ordinary economic voting behavior in the extraordinary election of Adolf Hitler," *The Journal of Economic History* 68, no. 4 (2008): 952.

25. S. H. Lehmann, "The German elections in the 1870s: why Germany turned from liberalism to protectionism," *The Journal of Economic History* 70, no. 1 (2010): 146–178.

26. This generalization is not possible for various other distinct aspects of German society: the religious division with a strong party allegiance along denominational lines found in the Weimar Republic, with the Centre Party as the voice of political Catholicism and the DNVP as a distinctly Protestant party; the "existence of a pre-1914 Junker-style agrarian elite"; and the strong electoral gains of the far-left as a result of the Great Depression (see A. de Bromhead et al., "Political extremism in the 1920s and 1930s: Do German lessons generalize?," *The Journal of Economic History*, 2013, 373).

with high productivity in its industry, broadly comparable to the UK, and incredibly backwards in its agricultural sector where productivity lagged significantly behind that in the UK, but which still accounted for a large share of total employment in the German economy.[27] However, Germany was hardly the only country with a large agricultural labour force at the time. While 30.5 % worked in farming in Germany, 25 % did so in the United States, 40.7 % in Sweden, 40.3 % in Czechoslovakia, and more than 70 % in less industrialized economies like Poland or Romania.[28] German agricultural workers were overpaid relative to this low productivity, which made the sector less competitive,[29] a division that is also reflected in its trade policy interest groups: German manufacturing competed in a global market and benefited from free trade, while German agriculture had most to gain from a high-tariff regime.[30].

The existence of the Junker elite and its role in German politics is also the basis of Alexander Gerschenkron's explanation for the rise of National Socialism in *Bread and Democracy in Germany*.[31] Gerschenkron traces the enduring power of the landlords in the German political system from the Wilhelmine Empire to the Second World War. In his book, written before the end of the war, Gerschenkron uses his historical analysis to argue for

27. S. N. Broadberry, "Anglo-German productivity differences 1870–1990: A sectoral analysis," *European Review of Economic History* 1, no. 2 (August 1997): 247–267; S. N. Broadberry, "How Did the United States and Germany Overtake Britain? A Sectoral Analysis of Comparative Productivity Levels, 1870-1990," *The Journal of Economic History* 58, no. 2 (1998): 375–407; S. Broadberry and C. Burhop, "Comparative Productivity in British and German Manufacturing before World War II: Reconciling Direct Benchmark Estimates and Time Series Projections," *The Journal of Economic History* 67, no. 2 (2007): 315–349.

28. H. James, *The end of globalization: lessons from the Great Depression* (Harvard University Press, 2001), 111.

29. S. Broadberry and C. Burhop, "Real Wages and Labor Productivity in Britain and Germany, 1871-1938: A Unified Approach to the International Comparison of Living Standards," *The Journal of Economic History* 70, no. 2 (2010): 400–427.

30. Germany was not alone in Europe in having a very large agricultural sector in the interwar period and it is Britain, not Germany, that constitutes the exception in this regard, as pointed out by Tooze (*The Wages of Destruction: The Making and Breaking of the Nazi Economy*, 167)

31. A. Gerschenkron, *Bread and Democracy in Germany*, Cornell Studies in Security Affairs (University of California Press, 1943).

the necessity of completely aboliting the Junker class to allow for a stable new German democracy.[32]

Gerschenkron presents the debate over trade and tariffs and the ways in which special interests shaped consequential shifts within it – the political left and liberal forces aligned with modern industry on the one side, the Junkers and heavy industry on the other – as the core conflict of modern German history. This conflict is where this dissertation begins and to which it will return throughout. Decisions in trade policy were some of the central paradigm shifts in German history, from the foundation of Bismarck's *Reich* to the rise of the most extreme proponents of autarky, the National Socialists, and beyond into the post-war history. As Cornelius Torp writes in his monograph on pre-1914 German trade policy: "Hardly any other political topic has been so permanently in the focus of public interest, hardly any other problem has been the subject of such bitter controversy as the question of customs and trade policy."[33] What was true of the Wilhelmine era also applies to the interwar years.

Torp points out that "historians studying the German Empire long ago recognized the centrality of tariff and trade policy as a field of political conflict."[34] Decades of trade liberalization from the mid-19th century ended abruptly in 1879. Tariffs, especially those on agricultural goods, became more "trade-friendly" again under Chancellor Leo von Caprivi before German trade policy swung back towards protectionism under his successor, Bernhard von

32. However, Luebbert has questioned the validity of this argument for the interwar period since in other European countries, "there is no correlation between the rural social structure (in particular the size of the dependent labour force), and the regime outcome" and the landed elite "did not necessarily control [the rural population's] political behavior"(see G. M. Luebbert, "Social foundations of political order in interwar Europe," *World Politics* 39 (1986): 477).

33. C. Torp, *Die Herausforderung der Globalisierung: Wirtschaft und Politik in Deutschland 1860-1914*, vol. 168 (Vandenhoeck & Ruprecht, 2005), 15.

34. C. Torp, *The challenges of globalization: economy and politics in Germany, 1860-1914* (Berghahn Books, 2014), 8.

Bülow. Various authors from Gerschenkron[35] to Gessner[36] and Stegmann[37] have described how trade policy remained such a central field of political conflict after World War I.

1.2.2 The International Environment and the Gold Standard during the Great Depression

German trade policy in the interwar period is inextricable from the restrictions placed on it by the international environment, especially the gold standard. Re-instituted after the end of World War I, the gold standard increasingly showed its fundamental structural weakness as the Great Depression worsened. In the absence of credibility and international cooperation, gold no longer flowed in a stabilizing direction but out of countries in crisis thus putting them under deflationary pressure and forcing their central banks to pursue a contractionary monetary policy at the worst possible time.[38]

Eichengreen and Irwin have framed these restrictions imposed by the gold standard in the structure of a modified macroeconomic trilemma. Countries in the Great Depression faced a choice between three options: "wage and price deflation to restore external and internal balance at the current gold parity; trade and payments restrictions to limit spending on imports and reduce gold outflows; or abandoning the gold standard and allowing the exchange rate to depreciate."[39]

35. Gerschenkron, *Bread and Democracy in Germany*.

36. D. Gessner, "Agrarian Protectionism in the Weimar Republic," *Journal of Contemporary History* 12, no. 4 (1977): 759–778.

37. D. Stegmann, "Deutsche Zoll- und Handelspolitik 1924/5-1929 unter besonderer Berücksichtigung agrarischer und industrieller Interessen," in *Industrielles System und politische Entwicklung in der Weimarer Republik*, ed. D. Petzina and B. Weisbrod (Athenäum-Verlag, 1977); D. Stegmann, "Mitteleuropa 1925–1934: zum Problem der Kontinuität deutscher Außenhandelpolitik von Stresemann bis Hitler," in *Industrielle Gesellschaft und politisches System*, ed. F. Fischer et al. (Dietz, 1978).

38. The seminal account for this is Eichengreen (*Golden fetters: the gold standard and the Great Depression, 1919-1939*).

39. Eichengreen and Irwin, "The slide to protectionism in the Great Depression: Who succumbed and why?," 874.

Given the severe damage that deflation at the height of the crisis was causing, the major interwar economies opted for either the second or the third choice: the longer a country remained on the gold standard the more severe the restrictions it imposed on trade. Germany's extreme tariff hikes from 1930 onwards and its introduction of exchange controls after the 1931 banking crisis are prime examples of this. They allowed the Brüning government to maintain the gold parity of the Reichsmark while severely restricting international trade. One side effect of this decision was the creation of a currency bloc, the Reichsmark Bloc, with countries mostly in Southeastern Europe which also maintained parity and pegged their currency to the Reichsmark.[40] As Wolf and Ritschl have shown, however, the trade creation effect of this currency bloc was negligible.[41] Meanwhile, Mitchener and Wandschneider have found that exchange controls "appear not to have been successfully utilized as tools for rescuing banking systems, stimulating domestic output, or for raising prices. Rather they appear to have been maintained as a means for restricting trade (working alongside or in lieu of restrictions on imports) and repayment of foreign debts."[42]

Another external factor in the decision to restrict trade was the consideration of beggar-my-neighbor effects after the breakdown of the gold standard. Albers describes this as the last of three phases of interwar trade policy restrictions.[43] After a first period of tariff hikes to protect domestic industry and a second where trade policy had the goal to prevent capital outflow, this phase consisted mainly of retaliatory measures against countries that

40. There are various different definitions of which countries were members of the Reichsmark Bloc. The definition I use later in this thesis is one based on trade relations. Wolf and Ritschl, in contrast, define it based on currency pegs. While there is some overlap, their definition includes Czechoslovakia, but excludes Turkey and Yugoslavia.

41. 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.

42. K. J. Mitchener and K. Wandschneider, "Capital Controls and Recovery from the Financial Crisis of the 1930s," *Journal of International Economics* 95, no. 2 (2015): 200.

43. T. N. H. Albers, "Currency devaluations and beggar-my-neighbour penalties: evidence from the 1930s," *The Economic History Review* 73, no. 1 (2020): 234.

devalued their currency and discriminatory trade agreements. Germany, for instance, imposed a punitive tariff on the countries that left the gold standard in 1931, and increasingly gave preferential treatment to the Reichsmark Bloc countries that retained their peg to the Reichsmark and thus to gold. Albers argues that while abandoning the gold standard allowed countries to remain less protectionist and recover from the Great Depression more quickly, this step had negative effects on those countries that decided to maintain gold parity. The unilateral decision of, for instance, the United Kingdom to abandon gold parity made German exports to the UK more expensive in Sterling terms and therefore less competitive. As a result the gold standard countries, including Germany, resorted to discriminatory measures to counter these beggar-my-neighbor effects.[44]

1.2.3 A Gap in the Literature

Despite its centrality, the literature has paid relatively little attention to the matter of German interwar trade policy in recent years[45] and there has not been an in-depth quantitative assessment of German interwar trade policy that makes use of the available, highly disaggregated information from official statistical volumes. Such an assessment is the main contribution of this dissertation to the literature.

Earlier contributions overwhelmingly focus on the political dimension and analyze how individuals and interest groups like the *Reichslandbund* pushed Germany towards protectionism and how politicians negotiated trade treaties and multilateral agreements.[46] Where researchers have attempted a

44. Albers, "Currency devaluations and beggar-my-neighbour penalties: evidence from the 1930s," 254.

45. Noteworthy 21st-century exceptions here are the trade and trade policy treatment in Tooze (*The Wages of Destruction: The Making and Breaking of the Nazi Economy*) and the export-focused book by Ebi (*Export um jeden Preis: die Deutsche Exportförderung von 1932-1938*)

46. Important monographs on the topic include Gessner (*Agrardepression und Präsidialregierungen in Deutschland 1930 bis 1933: Probleme des Agrarprotektionismus am Ende der Weimarer Republik*), Becker (*Handlungsspielräume der Agrarpolitik in der Weimarer Republik zwischen 1923 und 1929*), Merkenich (*Grüne Front gegen Weimar: Reichs-Landbund und agrarischer Lobbyismus*

quantitative assessment, it tends to be either at a highly aggregate or at an anecdotal level. Contemporary writers of the interwar period took a more disaggregated approach (the already mentioned Harms[47] as well as Loose's analysis of individual trade treaties[48] are two examples), but lacked the statistical toolkit and computing power to go beyond a descriptive analysis. More economics-minded approaches to the period have mostly approached trade policy through the lens of Germany's financial imbalances.[49] However, none of these previous contributions have taken advantage of the wealth of highly disaggregated data available from the German Reich Statistical Office. The situation is similar for analyses of the structure of German trade itself. Where the available level of detail does get exploited, such as in the case of Hentschel[50] or Höpfner,[51] the years of the biggest trade upheavals during and after the Great Depression get omitted from the analysis. Höpfner[52] accurately summarizes the literature on German trade in the first half of the 20th century when he writes that it is divided into micro-studies of specific bilateral relationships and economic sectors on the one hand, and macro-level analyses of long-term shifts in the four main categories of goods on the other. More recently, Hungerland has made important contributions

1918-1933), Schulz (*Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*), and, for the Nazi era, Doering (*Deutsche Außenwirtschaftspolitik 1933-1935: die Gleichschaltung der Außenwirtschaft in der Frühphase des nationalsozialistischen Regimes*), Petzina (*Autarkiepolitik im Dritten Reich: Der nationalsozialistische Vierteljahresplan*), and Teichert (*Autarkie und Großraumwirtschaft in Deutschland 1930-1939: Außenwirtschaftspolitische Konzeptionen zwischen Wirtschaftskrise und Zweitem Weltkrieg*).

47. Harms, *Die Zukunft der deutschen Handelspolitik im Rahmen des Neuaufbaus der deutschen Volkswirtschaft und ihrer weltwirtschaftlichen Beziehungen*.

48. P. A. F. Loose, *Deutschlands Handelsvertragspolitik der Nachkriegszeit* (Bauer, 1939).

49. Ebi, *Export um jeden Preis: die Deutsche Exportförderung von 1932-1938*; A. Roselli, *Money and trade wars in interwar Europe* (Springer, 2014); A. O. Ritschl, "Nazi economic imperialism and the exploitation of the small: evidence from Germany's secret foreign exchange balances, 1938-1940," *The Economic History Review* 54, no. 2 (2001): 324–345.

50. V. Hentschel, "Zahlen und Anmerkungen zum deutschen Außenhandel zwischen dem ersten Weltkrieg und der Weltwirtschaftskrise," *Zeitschrift für Unternehmensgeschichte / Journal of Business History* 31, no. 2 (1986): 95–116.

51. B. Höpfner, *Der deutsche Außenhandel, 1900-1945: Änderungen in der Waren- und Regionalstruktur*, 05] (Lang, 1993).

52. Ibid., 2.

to our understanding of German trade in the first globalization before World War I by employing variety-level data, which for the first time allows us to assess the shifts and shocks in German trade relations at varying levels of detail in one consistent data set.[53] No comparable study has been conducted for the interwar period so far.

1.3 Road Map

The broad theme that emerges from the four core chapters of this dissertation is one that is in line with King et al.'s description of Weimar Germany as fairly "ordinary" in international comparison. I begin with a general literature review and historiography of German interwar trade policy in chapter 2. In chapter 3, I show that voting behaviour in the Weimar Republic was not only based on religious denominations or the impact of the Depression, as King et al.[54] have shown, but also on trade policy interests. I use King et al.'s methods and apply them to a new disaggregated data set of occupational groups, which I rank based on their exposure to international trade. I find that as trade policy came to the forefront of Weimar politics, voters chose parties that best represented their interests on trade policy, whether that was free trade for the leading export industries or protectionism for those competing with imports. Within agriculture, smaller livestock farms were less protectionist than bigger grain farms as theory would predict. This contradicts the narrative of the Junkers as being able to manipulate the broader agricultural population into voting against their interests.

53. W. Hungerland, "Der deutsche Außenhandel in der Ersten Globalisierung: neue Daten, neue Erkenntnisse," *WISTA–Wirtschaft und Statistik* 72, no. 1 (2020): 65–77; W.-F. Hungerland and C. Altmeppen, "What is a product anyway? Applying the Standard International Trade Classification (SITC) to historical data," *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 2020, 1–15.

54. King et al., "Ordinary economic voting behavior in the extraordinary election of Adolf Hitler."

In chapter 4, I contextualize the German trade collapse of the early 1930s and compare it to that in the UK at the same time and the Great Trade Collapse of 2009 in the United States and elsewhere. I find many similar broad trends and patterns in all cases, with some notable differences. Just as in the UK, the German trade collapse occurred almost entirely on the intensive margin but was in part due to a disproportionate price collapse. A trade policy paradigm shift happened at the height of the Great Depression. Trade in industrial goods declined more than consumer goods trade in the early years of the Great Depression while this pattern was reversed after 1931, again similar to Britain. Differentiated goods were less affected by the price decline than non-differentiated goods. Imports from what would become the Reichsmark Bloc, a group of Southeast European and Latin American countries that profited from discriminatory trade policy in the mid-1930s, fell less than imports from the rest of the world until 1931 but fell more in the second half of the Depression.

In chapter 5, I briefly discuss the concept of effective protection and show to what extent it matters for the real impact of protectionist measures as compared with nominal tariff rates. I show that using effective protection emphasises the disproportionate protection towards agriculture and the food and beverage industry in the German economy of the early 1930s. Nominal rates appear to underestimate this shift.

Finally, in chapter 6, I investigate the role of trade policy in causing the trade collapse and subsequent re-orientation towards Southeastern Europe and the countries of the *Reichsmark* Bloc. I use a computable general equilibrium (CGE) model to simulate German trade with tariffs frozen at their 1929 level. I find that, similar to other countries like the UK,[55] the United States[56] or

55. A. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection," *American Economic Review* 109, no. 2 (2019): 325–52.

56. D. A. Irwin, "The Smoot-Hawley tariff: A quantitative assessment," *Review of Economics and Statistics* 80, no. 2 (1998): 326–334.

India[57] during the interwar period, the rise in tariffs accounts for a very large share of the decline in trade, in fact, one that is much larger than in the other countries. I also find that a lot of this rise in tariffs is driven not by explicit legislative changes, but by the period's extreme deflationary forces, which lowered the effective ad valorem tariff rate. In contrast, tariffs, quotas, and secret import agreements did not contribute anything to the rising share of the Reichsmark Bloc among German imports and only contributed very little to that increase within the category of strategically important goods that the Nazis wanted for their war economy. Chapter 7 concludes.

1.4 Outlook

The results of this dissertation lend further credence to the idea that we should not treat interwar Germany as an obscure outlier and that, ultimately, what happened in Germany is the result of the same economic forces that led to paradigm shifts in policy elsewhere around the world during the Great Depression. If Germany was different from, for instance, the United Kingdom, these differences can be found in the underlying economic structure with a more dominant and simultaneously very backwards agricultural sector. As Adam Tooze describes in his analysis of the Nazi party's agricultural platform, the agrarian ideal that Hitler envisioned was not as detached from reality as it may appear to a modern reader: "Nazi agrarianism, with its florid and racist rhetoric of blood and soil and its high-flown ideas about the future of the German peasant, was not an atavistic gloss on a modern industrial regime. Nazism both as an ideology and as a mass political movement, was the product of a society still in transition."[58] With 29 % of the German workforce still employed in agriculture by 1933 and many more engaged in

57. V. Arthi et al., *The Impact of Interwar Protection: Evidence from India*, Working Paper, Working Paper Series 27178 (National Bureau of Economic Research, May 2020).

58. Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy*, 168.

at least some form of part-time subsistence livestock farming, the political heft that the agricultural lobby carried in Germany is hardly surprising.[59]

This dissertation contributes to the growing body of literature investigating the economic history of the interwar period with new, increasingly disaggregated data sources and the application of new quantitative methods. It is one piece in the puzzle of the enormous economic forces that changed the course of European history in just a few years between 1929 and 1933.

The material investigated in this dissertation could not be more topical. We have just experienced the third big trade collapse of the last 100 years due to the coronavirus pandemic[60] with the World Trade Organization estimating in March 2021 that the volume of global merchandise trade declined by 15.0 % year-on-year in the second quarter of 2020.[61] Meanwhile, over the last few years we have seen a return to tariff hikes and trade wars with large trade-distorting effects,[62] to countries closing their borders and creating uncertainty and unpredictability over trade policy – like in the case of the United Kingdom's exit from the European Union[63] – and vocal interest groups voicing their desire for protectionist measures. Understanding the political economy of protectionism and the interaction of policy and trade has only become more important. Major shifts like these do not happen often but can have an outsized impact on the world economy. It is all the more important to take advantage of the historical sources on previous trade collapses to better understand their structure.

59. Ibid., 166.

60. B. Baschuk, "WTO Says Global Trade Collapse May Be Worst in a Generation," 2020, accessed April 21, 2020, https://www.bloomberg.com/news/articles/2020-04-08/wto-says-2020-global-trade-collapse-may-be-worst-in-a-generation; R. Baldwin, "The Greater Trade Collapse of 2020: Learnings from the 2008-09 Great Trade Collapse," *VoxEU.org*, 2020,

61. World Trade Organization, "World trade primed for strong but uneven recovery after COVID-19 pandemic shock," 2021, accessed October 13, 2020, https://www.wto.org/english/news_e/pres21_e/pr876_e.htm.

62. M. Li et al., "The U.S.–China trade war: Tariff data and general equilibrium analysis," *Journal of Asian Economics* 69 (2020): 101216.

63. M. A. Crowley et al., "The Looming Threat of Tariff Hikes: Entry into Exporting under Trade Agreement Renegotiation," *AEA Papers and Proceedings* 110 (May 2020): 547–51.

The data introduced in this dissertation offer many exciting pathways for future research. The availability of disaggregated trade data for the interwar period means that it now becomes possible to develop a more long-term narrative of the history of German trade. The disaggregated trade data at the good and at the variety level presented here close a previously existing gap between the detailed post-war trade statistics and the Wilhelmine-era trade statistics digitized and analyzed by Hungerland[64] while offering more depth and breadth than the previous attempt by Höpfner.[65] Furthermore, the availability of various demographic variables at the district level – variables that range from the share of textile workers to the number of pigs by farm size in each district – will lend themselves well to further analysis of the spatial economy of interwar Germany.

64. Hungerland, "Der deutsche Außenhandel in der Ersten Globalisierung: neue Daten, neue Erkenntnisse."

65. Höpfner, *Der deutsche Außenhandel, 1900-1945: Änderungen in der Waren- und Regionalstruktur*.

2

The History of German Trade Policy from the Weimar Republic to the Early Years of Nazi Rule

2.1 Overview

Trade policy in the Weimar Republic can roughly be divided into three periods. From the foundation of the Republic and the signing of the Treaty of Versailles in 1919 to January 1925, Germany was not allowed to conduct an independent trade policy, as the victorious powers retained control and claimed special privileges. From 1925 to 1929, the government began to rebuild its trade relations, reformed the tariff system and negotiated new trade treaties aimed at establishing Most Favoured Nation (MFN) status. In this period trade policy mirrored the attempts in German foreign policy

under Stresemann to reintegrate Germany into the community of European nations. Finally, from 1929 onward, a shift towards protectionism occurred in response to the agrarian crisis, and accelerated after the nationalist DNVP joined the government in 1930. Tariffs rose and treaties were aimed more and more at establishing protection of domestic markets than at lowering barriers. Instead of ending the period of analysis in 1933 with the Nazi rise to power, I extend it to 1934 since the paradigm shift in trade policy occurs only then, with Hjalmar Schacht's New Plan setting Germany on a course towards autarky.[1] The first year of Nazi rule still fits into the continuity of the previous years with regards to trade policy.

Table 2.1 provides an overview of the most important events in German trade policy during the interwar period.

2.2 From the Treaty of Versailles to Restored Sovereignty (1919-1925)

2.2.1 Limited Sovereignty under the Treaty of Versailles

The Treaty of Versailles established in article 267 that "(e)very favour, immunity or privilege in regard to the importation, exportation or transit of goods granted by Germany to any Allied or Associated State or to any other foreign country whatever shall simultaneously and unconditionally, without request and without compensation, be extended to all the Allied and Associated States."[2] Germany was thus forced to give non-reciprocal MFN status to all its former enemies for a period of five years. Furthermore, imports from Alsace-Lorraine, Luxemburg, and the Saar were exempt from tariffs to ensure the continued access of the local coal and steel industry to the German

1. I follow the example of Loose (*Deutschlands Handelsvertragspolitik der Nachkriegszeit*, 39) here, who also sees 1934 as the "decisive upheaval" in German trade policy.

2. C. Bevans, ed., "Treaty of Peace with Germany (Treaty of Versailles)," in *Treaties and other international agreements of the United States of America, 1776-1949*, vol. 2 (1969), 43–241.

Table 2.1: Timeline of German Interwar Trade Policy

Date	Event
Jan-25	Treaty of Versailles restrictions on German trade policy end
Aug-25	Kleine Zollnovelle (Small Tariff Amemdment) restores most tariffs to their pre-WWI levels; trade war with Poland begins
Mar-28	Franco-German trade agreements marks normalisation of economic relations (signed 1927)
Mar-30	Big increases in agricultural tariffs
Apr-30	Further increases mostly in agricultural tariffs, many by >100 %
May-30	Further increases mostly in agricultural tariffs, many by >100 %. Tariffs continued to increase several times a year in subsequent years
Aug-31	Introduction of exchange controls to curb capital outflow
Dec-31	Foreign exchange supply for importers gets reduced to 75 %
Feb-32	Introduction of the Obertarif (higher tariff rate) that can be applied to any country without MFN status
Mar-32	Foreign exchange supply for importers gets reduced to 65 % in March, 55 % in April, 50 % in May
Apr-32	First clearing agreement with Hungary, expanded in the following years into a network of bilateral agreements primarily with Eastern Europe
Mar-34	Foreign exchange supply for importers gets reduced further to 45 % in March, 35 % in April, 25 % in May, 10 % in June
Sep-34	Schacht's New Plan comes into force, puts most foreign trade under direct state control
Nov-35	Normalisation of German-Polish trade relations with a trade treaty
Jun-35	Changes to German-American Treaty of Friendship restrict MFN status for American goods

market.[3] The restoration of a sovereign trade policy subsequently became a core topic of German foreign policy.[4] This period of limited sovereignty ended on 10 January, 1925. Already in the summer of 1924, the government began negotiations with a few countries for new trade treaties.[5] However, Harms notes that these negotiations were conducted without a clear view of the strategic direction of future German trade policy. Trade policy in these early years after the war was still primarily a "management of scarcity" as Holtfrerich[6] describes: "a scarcity of foreign currency reserves, foreign credit, food, raw materials, manufactures and also scarcity of access to foreign markets." The economic ministry therefore operated a system of strict import and export control.

2.2.2 Trade Policy and the Great Inflation

The high inflation of the immediate post-war years that culminated in the hyperinflation of 1923 posed a problem for German trade policy. Tariffs were set in absolute terms rather than *ad valorem* so that the effective tariff rates were eroded as the value of the Mark collapsed. The restrictions imposed at Versailles made it impossible to quickly adjust tariff rates. As the value of the gold mark and the paper mark drifted apart, Germany began demanding payment of tariff debt in gold or a gold-backed foreign currency such as the US dollar on 21 July 1919.[7] However, this was not possible initially along the western border: The French, who occupied the Rhineland and later the

3. C. S. Maier, *Recasting bourgeois Europe: stabilization in France, Germany, and Italy in the decade after World War I* (Princeton University Press, 2015), 520.

4. H.-J. Schröder, "Zur politischen Bedeutung der deutschen Handelspolitik nach dem Ersten Weltkrieg," in *Die deutsche Inflation. Eine Zwischenbilanz*, ed. G. D. Feldman (1982).

5. Harms, *Die Zukunft der deutschen Handelspolitik im Rahmen des Neuaufbaus der deutschen Volkswirtschaft und ihrer weltwirtschaftlichen Beziehungen*, 70.

6. C.-L. Holtfrerich, "Aus dem Alltag des Reichswirtschaftsministeriums während der Großen Inflation 1919–1923/24," in *Das Reichswirtschaftsministerium der Weimarer Republik und seine Vorläufer*, ed. C.-L. Holtfrerich (Berlin, Boston: De Gruyter Oldenbourg, 2016), 224–360.

7. C.-L. Holtfrerich, "Deutscher Außenhandel und Goldzölle 1919 bis 1923" (Berlin, Boston: De Gruyter, 1986), 478.

Ruhr area, refused to accept any such adjustment to the German tariff rates, thus creating a "hole in the West", which could only be temporarily closed through a compromise in the spring of 1920. The hole was later re-opened in 1921 and continued to exist throughout the French occupation of the Ruhr and beyond until the autumn of 1924.[8] From late 1921 onwards, the *Goldzollaufgeld* (gold tariff surcharge), the multiplier that was applied to the official tariff rates to maintain their relative value, was adjusted monthly, and later, as inflation accelerated, weekly. The Allied governments agreed to this modification despite the clause in the Treaty of Versailles that prohibited tariff hikes because they believed that it would improve Germany's ability to pay reparations.[9] Holtfrerich shows that these adjustments fell behind the devaluation of the Mark in international markets as well as domestic inflation and were thus not used for covert protectionism and, he argues, "it is more likely that the gold tariff premium reflects the expectations of the government with regards to currency development" rather than an actively used protectionist tool.[10] If German producers were compensated for their country's trade policy disadvantage, it was through "the inflation-induced mark depreciation alone", which made imports more expensive and German exports more competitive.[11]

2.2.3 The "Bülow Tariff" and the Post-War Status Quo

The legal basis of German tariff policy in early 1925 was still the "Bülow tariff" of 1902, although the specific tariff rates had been changed many times.

8. For a detailed discussion of the "hole in the West" and its implications for German foreign trade statistics, see Holtfrerich ("Aus dem Alltag des Reichswirtschaftsministeriums während der Großen Inflation 1919–1923/24") and Tooze ("Wirtschaftsstatistik im Reichswirtschaftsministerium, in seinem Statistischen Reichsamt und im Institut für Konjunkturforschung").

9. Holtfrerich, "Aus dem Alltag des Reichswirtschaftsministeriums während der Großen Inflation 1919–1923/24," 308.

10. Holtfrerich, "Deutscher Außenhandel und Goldzölle 1919 bis 1923," 483.

11. Ibid., 484.

The most important complete tariff exemptions were introduced in the early days of the war. According to Harms, out of 946 tariff lines, 47 were still completely exempt and 9 partially exempt from tariffs in early 1925. With the exception of scrap iron, all of these fell into the category of agricultural products and other foodstuffs. They were exempted from tariffs to ensure the food supply during the war.[12] Similarly 19 tariff lines saw a decrease rather than a complete exemption, falling almost exclusively under agricultural produce. On the other hand, 239 tariffs were raised between 1902 and 1925. Most of them (about 80 per cent) were doubled in the tariff reform of 1 May, 1922.[13] Many textile goods were affected by a 50 per cent increase in September 1922 and a further increase on a range of tariff lines followed in September 1923.[14] In part, these increases only reflected severe inflation in the immediate post-war years, since most tariffs were set in Reichsmark rather than *ad valorem*. However, comparing the pre-hyperinflation Mark with the new Reichsmark, the tariff hikes exceeded inflationary adjustments by far, especially in the case of industrial products with an increase of about 350 per cent compared to a 40 to 50 per cent price increase between 1913 and the beginning of 1925, before the tariff reform of that year.[15] High industrial tariffs, according to Harms, contributed to a domestic price level for the affected goods above the world market price in spite of lower wages, lower food prices and lower housing costs.[16]

In addition to tariffs, trade with Germany was subject to a myriad of import bans, which, in 1924, affected 457 out of 946 tariff lines, including

12. Harms, *Die Zukunft der deutschen Handelspolitik im Rahmen des Neuaufbaus der deutschen Volkswirtschaft und ihrer weltwirtschaftlichen Beziehungen*, 72.

13. Ibid., 73.

14. These tariff hikes were allowed even under the restrictions set by the Treaty of Versailles as long as they did not violate the Allied countries' MFN status. Germany was allowed to raise its autonomous tariffs above their pre-war level from July 1920 onwards (see Holtfrerich ("Deutscher Außenhandel und Goldzölle 1919 bis 1923," 473)).

15. Harms, *Die Zukunft der deutschen Handelspolitik im Rahmen des Neuaufbaus der deutschen Volkswirtschaft und ihrer weltwirtschaftlichen Beziehungen*, 73.

16. Ibid., 78.

almost half of all tariff lines for textiles. These often led to monopolistic domestic prices, for example in the automobile sector.[17] Export bans, on the other hand, were small in number but affected almost all essential agricultural products. As described by Holtfrerich, the German government maintained a tight control of foreign trade in the early years of the Weimar Republic.[18]

In spite of the lack of complete sovereignty in trade policy, Germany signed various treaties in the early 1920s. MFN status with Hungary was agreed upon in June 1920, with Austria in September 1920, and with Bulgaria in February 1921. In July 1924, an ancillary agreement with Austria lowered several tariffs on industrial goods.[19] Turkey was treated as a most favoured nation without a formal treaty that codified this. The most prominent examples of pre-1925 treaties with a particularly strong symbolic power were the 1923 agreement with the United States and the 1924 agreement with the United Kingdom.[20] Schröder argues that these two treaties, along with a 1924 agreement with Belgium, ensured that by 1925, the treaty system was already developed enough to prevent a French attempt to prolong the limitations imposed at Versailles.

Not only did the German government regain its *de jure* sovereignty in 1925, but it had also gained the *de facto* ability by this point to effectively control its imports and exports. The Wilhelminian state had not possessed "the effective import-export control bureaucracy required to manipulate the flow of trade as either a reward or a punishment". It was so poorly set up that it "could not even administer a discriminatory tariff against Russian grain" under Chancellors Caprivi and Bülow at the turn of the century. The Weimar Republic, in contrast, managed to establish a "mixed private public

17. Ibid., 81.

18. Holtfrerich, "Aus dem Alltag des Reichswirtschaftsministeriums während der Großen Inflation 1919–1923/24," 303ff.

19. Harms, *Die Zukunft der deutschen Handelspolitik im Rahmen des Neuaufbaus der deutschen Volkswirtschaft und ihrer weltwirtschaftlichen Beziehungen*, 84.

20. Schröder, "Zur politischen Bedeutung der deutschen Handelspolitik nach dem Ersten Weltkrieg."

system of regulation as 'economic self-administration'."[21] This system would eventually allow the Nazis to impose a system of rigid state control of trade.

2.2.4 Remaining Pre-War Treaties in 1925

For most nations that were neutral during the war,[22] old trade treaties with Germany were still in force. The previously existing trade treaty with Sweden expired in 1921 with Germany continuing to apply MFN status for Swedish goods afterwards. An agreement with Switzerland on the reduction of import restrictions came into force in December 1924. Trade with Spain was regulated by a provisional treaty from July 1924 that ensured tariff exemptions and reductions for many Spanish goods.[23]

Pre-war treaties with enemy states, on the other hand, ceased to be in force as a consequence of the war. As previously mentioned, all of these states[24] were granted unilateral MFN status in the Treaty of Versailles.[25] In all cases where no follow-up treaty had been signed by 10 January, 1925, the maximal tariff was applied afterwards, with the exception of those countries which were affected by a directive of September 1924 granting MFN status without a treaty.[26]

21. Spaulding, "German Trade Policy in Eastern Europe, 1890-1990: Preconditions for Applying International Trade Leverage," 360.

22. Ethiopia, Argentina, Chile, Colombia, Denmark, Mexico, Netherlands, Norway, Paraguay, Persia, Salvador, Venezuela. Many of these treaties dated back to the period of liberalization in the mid-19th century. Plaut describes these as "colourless" meaning that they did not include any good-specific rules but rather laid the foundation for an orderly and mutually beneficial bilateral trade relationship (cf. Holtfrerich ("Aus dem Alltag des Reichswirtschaftsministeriums während der Großen Inflation 1919–1923/24," 328) and Plaut (*Deutsche Handelspolitik*, 234)).

23. Harms, *Die Zukunft der deutschen Handelspolitik im Rahmen des Neuaufbaus der deutschen Volkswirtschaft und ihrer weltwirtschaftlichen Beziehungen*, 86.

24. Belgium, Bolivia, Brazil, China, Ecuador, France, Greece, the United Kingdom, Guatemala, Haiti, Honduras, Italy, Japan, Cuba, Liberia, Nicaragua, Panama, Peru, Portugal, Romania, Russia, Yugoslavia, Siam, Uruguay, and the United States of America

25. Harms, *Die Zukunft der deutschen Handelspolitik im Rahmen des Neuaufbaus der deutschen Volkswirtschaft und ihrer weltwirtschaftlichen Beziehungen*, 87.

26. Countries that already entered a new agreement with Germany before the expiry of the Versailles provisions include Bolivia (March 1924, reactivation of the pre-war treaty), China (July 1921, equal treatment in trade in raw materials and manufactures), Ecuador (renewal of

Regarding the countries that had newly come into existence after the war, the German government mostly entered into temporary agreements with them that granted partial MFN status. Such treaties existed with Estonia, Finland, Latvia, Lithuania, and Czechoslovakia. Poland was given unilateral MFN status for five years through the Treaty of Versailles like the victor states, and goods from Upper Silesia received a complete exemption from German import tariffs for 15 years.[27] Trade with Egypt, Hejaz, and Memel remained without a formal basis in the first half of the 1920s.

2.2.5 The State of Trade and Policy in International Comparison

While Germany was limited in its ability to autonomously raise its own tariffs between 1919 and 1925, other major countries were far more protectionist. In late 1925, Spain had an average tariff level of 40 per cent, the United States one of more than 25, Eastern Europe and Italy 15 to 25. Germany found itself in a rather moderate position with tariffs of 10 to 15 per cent, just like Austria, Switzerland, and Sweden. The traditionally small open economies of Belgium, Denmark and the Netherlands, as well as the United Kingdom set their rates at below 10, the latter two even below 5 per cent.[28] High foreign tariffs were a big problem for the export-dependent German economy. Industrial goods – which constituted 66.1 per cent of German

the pre-war treaty from 1887), Greece (July 1924, provisional treaty with general MFN status granted by Germany), the United Kingdom (December 1924, reciprocal MFN status, later to be formally extended to the dominions), Guatemala (November 1924, reciprocal MFN status), Italy (August 1921, provisional treaty with reciprocal MFN status), Nicaragua (1924, renewal of the 1896 treaty), Portugal (April 1923, provisional treaty with quotas granted for Portuguese produce), Russia (Treaty of Rapallo April 1922, reciprocal MFN status, extended to the other Soviet Republics in November 1922), Yugoslavia (December 1921, provisional treaty, partial reciprocal MFN status), Siam (February 1924, reciprocal MFN status), and the USA (December 1923, reciprocal unconditional MFN status with exceptions for America's relationships with its colonies).see (ibid., 90)

27. Ibid., 90.

28. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 50.

exports in 1925 – were subject to especially high rates.[29] Germany's share of world trade had suffered significantly since the war, dropping from 13.12 % in 1913 to 6.73 % in 1924.[30] Hungerland and Wolf provide a detailed account of the pre-1914 landscape of German trade relations.[31]

The most important source of imports in the mid-1920s were the United States at 17.7 %. Other important trading partners included the United Kingdom (7.6 % of imports), the Netherlands (6.0), France (5.3 incl. Saar and Alsace-Lorraine) India (5.2), Argentina (5.1), the CSSR (4.3), Italy (4.0), Poland (3.4), and Belgium (3.0).[32] Germany was an important export market especially for many small European countries. 50.7 % of all Lithuanian exports went to Germany in 1925, 39.0 % of Polish, 31 % of Estonian, 26.3 % of Greek[33], 24.6 % of Dutch, 22.5 % of Czechoslovak, 20.5 % of Danish, and 20 % of Bulgarian.[34]

2.3 The Reconstruction of Tariffs and Trade Treaties (1925-28)

2.3.1 The Political Economy of Trade Policy

With sovereignty in trade questions restored in January 1925, the German government embarked on a comprehensive overhaul of the autonomous tariff law. Opinions were split regarding the decision between free trade and protectionism. Heavy industry and agriculture both favoured a more protectionist approach and advocated "an autonomous trade treaty system

29. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 52.

30. Ibid., 46.

31. W.-F. Hungerland and N. Wolf, "The Panopticon of Germany's Foreign Trade, 1880-1913. New Facts on the First Globalization," *CEPR Discussion Paper*, no. DP15988 (2021).

32. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 58.

33. in 1924

34. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 59.

with minimum tariffs and the possibility of short-term termination of tariff agreements."[35] The agricultural sector was heavily indebted by 1925, a situation worsened by rising interest rates and falling food prices. Farmers therefore vigorously demanded protection from the government.[36] The *Reichslandbund* (RLB), an agricultural lobbying association, was deeply entrenched in the anti-parliamentarian political spectrum.[37] The political influence of the agricultural lobby is probably the aspect that has received the most attention in the literature on German trade policy with central works by Gessner,[38] Panzer,[39] and Merkenich.[40] The new, export-oriented industry sectors, such as chemicals, electronics, optics, mechanical engineering, were in support of more trade liberalisation, relying on their competitiveness in the global market. The most important industrial interest group, the *Reichsverband der Deutschen Industrie* (RDI) began to be dominated by the free-traders in 1925 under its new president, Carl Duisberg.[41] The trajectory of its political role has been drawn out in two monographs, one by Wolff-Rohé for the early years of the republic, one by Neebe for the 1930s.[42]

35. Ibid., 60.

36. Stegmann, "Deutsche Zoll- und Handelspolitik 1924/5-1929 unter besonderer Berücksichtigung agrarischer und industrieller Interessen"; Gessner, *Agrardepression und Präsidialregierungen in Deutschland 1930 bis 1933: Probleme des Agrarprotektionismus am Ende der Weimarer Republik*, 499.

37. E. Kolb, *The Weimar Republic* (Taylor & Francis, 2005), 176.

38. Gessner, *Agrardepression und Präsidialregierungen in Deutschland 1930 bis 1933: Probleme des Agrarprotektionismus am Ende der Weimarer Republik*; Gessner, *Agrardepression und Präsidialregierungen in Deutschland 1930 bis 1933: Probleme des Agrarprotektionismus am Ende der Weimarer Republik*; D. Gessner, "Agrarprotektionismus und Welthandelskrise 1929/32. Zum Verhaltnis von Agrarpolitik und Handelspolitik in der Endphase der Weimarer Republik," *Zeitschrift fur Agrargeschichte und Agrarsoziologie*, 1978,

39. A. Panzer, *Das Ringen um die deutsche Agrarpolitik: von der Währungsstabilisierung bis zur Agrardebatte im Reichstag im Dezember 1928* (Mühlau, 1970).

40. Merkenich, *Grüne Front gegen Weimar: Reichs-Landbund und agrarischer Lobbyismus 1918-1933*.

41. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 63.

42. S. Wolff-Rohé, *Der Reichsverband der Deutschen Industrie 1919-1924/25* (Lang, 2001); R. Neebe, *Großindustrie, Staat und NSDAP 1930-1933: Paul Silverberg und der Reichsverband der Deutschen Industrie in der Krise der Weimarer Republik*, Kritische Studien zur Geschichtswissenschaft (Vandenhoeck & Ruprecht, 1981).

The political world was similarly divided. The Social Democratic Party (SPD) favoured free trade. The nationalist German National People's Party (DNVP), as the party of the Protestant landlords in East Elbia and thus natural ally of the RLB in the 1920s, was fiercely protectionist. Within the cabinet, the division was mirrored by the more liberal foreign office (*Auswärtiges Amt*, AA) and economic ministry (*Reichswirtschaftsministerium*, RWM) on the one side, and the protectionist ministry for agriculture (*Reichsministerium für Ernährung und Landwirtschaft*, RMEL) on the other.[43] Maier describes both the AA and the RWM as "headed by permanent teams who saw their roles as impartial civil servants" and thus ensured a degree of continuity and moderation in trade policy.[44]

The most prominent protectionist voice in the cabinet was DNVP politician Martin Schiele, minister of the interior under Luther in 1925 and later minister for agriculture. While he still had to fight for compromises in the 1920s, his power soon outgrew that of his opponents in the AA and RWM during the chancellorship of his close acquaintance Heinrich Brüning in the early 1930s. Gustav Stresemann, the foreign minister, and Julius Curtius, the economics minister were the strongest voices for free trade in the 1920s. The RWM was also dominated by free-traders below the ministerial rank, notably by State Secretary Ernst Trendelenburg and Ministerial Director Hans Posse.[45]

The Foreign Ministry was formally in charge of coordinating trade policy, but to accommodate the diversity of interests, an inter-ministerial Committee for Trade Policy (Handelspolitischer Ausschuß, HPA) was established in March 1925, against the wishes of Gustav Stresemann.[46] It included one

43. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 61-63.

44. Maier, *Recasting bourgeois Europe: stabilization in France, Germany, and Italy in the decade after World War I*, 543.

45. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 69-71.

46. J. Radkau, "Entscheidungsprozesse und Entscheidungsdefizite in der deutschen Außenwirtschaftspolitik 1933—1940," *Geschichte und Gesellschaft* 2, no. 1 (1976): 33–65.

representative each from the foreign, economic, finance, and agricultural ministries. Through the course of the Great Depression this committee became the "control room of policy" and "gravitational core of the Berlin ministerial bureaucracy".[47]

2.3.2 Tariff Reform in the "Small Tariff Amendment" of 1925

Apart from the fact that Germany's ability to set its own tariff was restricted by the Treaty of Versailles, Friedmann argues that there was another reason why agricultural tariffs were not reintroduced before 1925:

> Import duties on agricultural products would have been senseless during the early postwar years of food shortages, chaotic price inflation, and low consumer buying power. Nor would substantial duties have appeared appropriate during the crop year 1924/25, when short world wheat supplies raised international market prices to the highest peaks reached during the eighteen years 1922-39. Indeed, grain market conditions in the early postwar years following World War I made government protection of consumers appear much more pressing than protection of producers.[48]

The centre-right cabinet under Chancellor Luther adopted a moderately protectionist trade policy in early 1925, which resulted in the "Kleine Zollnovelle" (small tariff amendment) of August 1925 rather than the originally intended complete overhaul.[49] The amendment came into force on 1 October, 1925.[50] The 1902 "Bülow Tariff" thus remained the basis of German trade policy. The DNVP had joined the cabinet after the elections in December 1924 with the intention to block the SPD from participating in the new government under chancellor Luther. A compromise on tariffs now

47. H.-P. Höpfner, *Deutsche Südosteuropapolitik in der Weimarer Republik* (Frankfurt: Peter Lang, 1983), 99.

48. K. J. Friedmann, "German Grain Policies and Prices, 1925-1964," *Food Research Institute Studies* 5, nos. 1387-2016-116066 (1965): 33.

49. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 61.

50. Stegmann, "Deutsche Zoll- und Handelspolitik 1924/5-1929 unter besonderer Berücksichtigung agrarischer und industrieller Interessen," 501.

had to be found and grain tariffs were re-introduced for the first time since their abolition during the war. Tariffs were also raised on raw materials and semi-finished products to protect the iron industry.[51] In comparison to the Bülow Tariff, however, tariffs were raised significantly on industrial goods, whereas agricultural tariffs temporarily remained moderate. The rye and wheat tariffs, for example, were set at 3 and 3.5 RM per 100 kg, respectively, which, as Becker points out, was 2 RM below the pre-war rate and 4 RM below the 1902 rate.[52][53] The rate for barley, on the other hand, was kept even lower at 1 RM to ensure access to a cheap feedstuff for peasants in Westphalia and Württemberg, the electoral base of the Centre party.[54] Tariffs on meat, bacon, and lard were below their pre-war levels, those on livestock and butter above. Furthermore, tariffs on milk and cream were newly introduced. Processed food tariffs were raised more severely.[55] Becker sees these developments as a shift in priorities from the protection of land-intensive grain production to that of small enterprises and regions more focussed on food processing.[56]

Agricultural tariffs remained at a temporarily lower level until 1927 when they were fully restored to their 1902 level, in the case of livestock and processed food even far exceeding it.[57] Stegmann describes the amendment

51. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 61.

52. Becker, *Handlungsspielräume der Agrarpolitik in der Weimarer Republik zwischen 1923 und 1929*, 153.

53. In ad valorem terms, this amounted to an even bigger decrease as unit values rose: The unit value of imports in 1912 was 172 Mark per metric ton for wheat and 139 Mark per metric ton for rye (see Statistisches Jahrbuch für das Deutsche Reich 1913, 172ff.) In 1924, the unit value of imported wheat was 250 RM per ton, that of rye was 193 RM per ton.

54. H. James, *The German slump: Politics and economics, 1924-1936* (Oxford University Press, USA, 1986), 265.

55. Becker, *Handlungsspielräume der Agrarpolitik in der Weimarer Republik zwischen 1923 und 1929*, 153.

56. Ibid., 155.

57. Merkenich, *Grüne Front gegen Weimar: Reichs-Landbund und agrarischer Lobbyismus 1918-1933*, 199.

as a victory for agriculture and heavy industry.[58] Pohl,[59] however, qualifies this assessment with the remark that at this point agriculture and heavy industry were far from equally powerful, and that heavy industry took the farmers "in tow" to support its political line of protection for iron. An introduction of a lower bound for tariffs, however, was prevented, so that there was some leeway left for bilateral treaty negotiations.[60] In international comparison, Krüger asserts, the amendment remained relatively moderate.[61] James even argues in its favour that while most contemporary economists were opposed to the re-introduction of the Bülow Tariff, it "played a major role in the political stabilisation of the Republic: it was the economic underpinning of a new quiet conservative republicanism".[62] Even the AA had eventually given in and supported this moderate tariff in order to come to a compromise with agriculture and heavy industry. Its main opponents were the Social Democrats, the trade unions, and the *Arbeitsgemeinschaft der eisenverarbeitenden Industrie* (AVI), the interest group representing the iron-processing manufacturing industries.[63]

2.3.3 Reconstruction of the MFN treaty system

Parallel to the changes in autonomous tariffs, the second pillar of German trade policy, the treaty system, also saw an increase in activity. Between 1924 and 1927 negotiations for new trade treaties began with France, the United Kingdom, Russia, Italy, Spain, Belgium, the Scandinavian and the Baltic countries, all with the goal of lowering agrarian tariffs in exchange

58. Stegmann, "Deutsche Zoll- und Handelspolitik 1924/5-1929 unter besonderer Berücksichtigung agrarischer und industrieller Interessen," 507.

59. K. Pohl, *Weimars Wirtschaft und die Außenpolitik der Republik 1924-1926: vom Dawes-Plan zum Internationalen Eisenpakt* (Droste, 1979), 114.

60. P. Krüger, *Die Außenpolitik der Republik von Weimar* (Wissenschaftliche Buchgesellschaft, 1985), 287.

61. Ibid., 288.

62. James, *The German slump: Politics and economics, 1924-1936*, 264.

63. Pohl, *Weimars Wirtschaft und die Außenpolitik der Republik 1924-1926: vom Dawes-Plan zum Internationalen Eisenpakt*, 118.

for concessions on German manufactured goods. The German demand for raw materials was satisfied through treaties with Argentina, Canada, South Africa, and Australia.[64] The negotiation road map envisioned by the RWM in 1925 prioritised Britain and the United States, followed by a second group of Western and Southern European countries (Belgium, France, Italy, Portugal, Spain, Switzerland), then Northern Europe (Scandinavia, the Netherlands, the Baltics), then Eastern and Southern Europe (Greece, Austria, Poland, Czechoslovakia, Turkey) and finally Bulgaria, Yugoslavia and Hungary.[65] Loose[66] points out that unlike in the Wilhelmine Period, where treaties could have a duration of up to twelve years, the treaties of the Weimar era were usually limited to one year. They usually did not expire, however, but were regularly extended. In the period between 1923 and 1930, all important trade treaties contained mutual unrestricted MFN status.[67] A useful contemporary overview of trade treaties signed each year with a summary of their content can be found in a series of publications by Held[68] for 1925 to 1930. Treaties in later years are conveniently listed in an official publication by the Reich Economic Ministry.[69] The complete treaties and tariff lists were published in the official German legislative publication, the *Reichsgesetzblatt*.

Negotiations with the United States already led to an agreement in 1923, which was ratified in 1925. The American government wanted to establish a system of MFN treaties in Europe and saw a treaty with a weakened, but export-oriented Germany as the ideal first step and important signal to the

64. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 72.

65. Höpfner, *Deutsche Südosteuropapolitik in der Weimarer Republik*, 150.

66. Loose, *Deutschlands Handelsvertragspolitik der Nachkriegszeit*, 4.

67. Stegmann, "Mitteleuropa 1925–1934: zum Problem der Kontinuität deutscher Außenhandelpolitik von Stresemann bis Hitler," 206.

68. H. J. Held and B. A. C. Breycha-Vauthier, "Chronik der Handelsverträge 1925—1927," *Weltwirtschaftliches Archiv* 26 (1927): 391–458; H. J. Held, "Chronik der Handelsverträge 1925—1928. Ergänzungen und Register," *Weltwirtschaftliches Archiv* 32 (1930): 283–316; Held, "Chronik der Handelsverträge 1925—1928. Ergänzungen und Register"; Held, "Chronik der Handelsverträge 1925—1928. Ergänzungen und Register."

69. Reichswirtschaftsministerium, *Übersicht über den Stand der wirtschaftspolitischen Beziehungen Deutschlands*, 1928–1938.

rest of Europe.[70] Eastern Europe, meanwhile, was of a lower priority to the German government in the mid-1920s. It only became more important through the course of the Great Depression.[71]

Trade treaties were not exclusively an economic, but also a political tool for Germany after it had lost a lot of its political and particularly its military power after WWI. Gustav Stresemann in particular "had long argued for an active integration of international economic and political concerns" and "as a product of the Saxon industrial environment, Stresemann understood Germany's remaining strengths in the new European order: [...][its] economic power."[72] In Estonia, Latvia, and Lithuania, for example, the German motivation for trade integration was the desire to prevent a Polish-led Baltic bloc.

Germany also remained committed to trade with Russia throughout the interwar period. The two countries already accorded each other MFN status in the Treaty of Brest-Litowsk and negotiated a series of economic treaties in 1921, 1925, 1928, 1932, and 1934. Especially the last two were explicitly aimed at lowering tariffs and facilitating trade.[73] Beitel and Nötzold see this economic relationship as evidence that Germany, even after Locarno, did not join a "unified anti-Soviet front" in the West.

The bilateral negotiations were similarly influenced by the rivalry between industrial and agrarian interests. One example of this were the treaty negotiations with Spain in 1924. Germany had, in 1923, restricted wine imports from the agricultural exporter Spain to protect domestic production. Now, a deal was struck that granted Spain MFN status with special concessions on wine tariffs. In return, Spain facilitated German access to its industrial product

70. Krüger, *Die Außenpolitik der Republik von Weimar*, 250.

71. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 73.

72. Spaulding, "German Trade Policy in Eastern Europe, 1890-1990: Preconditions for Applying International Trade Leverage," 351.

73. W. Beitel and J. Nötzold, *Deutsch-sowjetische Wirtschaftsbeziehungen in der Zeit der Weimarer Republik: e. Bilanz im Hinblick auf gegenwärtige Probleme*, vol. 3 (Nomos, 1979), 32-42.

market.[74] Extreme political pressure, however, delayed ratification of this treaty and, in July 1925, led to the unilateral termination of the agreement by Germany. A tariff war erupted. Spain raised tariffs on various German goods by 80 %. The conflict could only be settled once Spain accepted the German government's insistence to not grant tariff concessions on wine after all and the two countries signed a new treaty in May 1926.[75] This success of German agriculture was, Becker argues, an important step towards overcoming the primacy of industry in questions of trade policy.[76]

2.3.4 Export support through import licenses

The German government supported exporters of agricultural products by providing every exporter with an "import voucher" (*Einfuhrschein*) "equal in value to the import duty on the same products and applicable in payment of such duties or (in later months) of the year) in payment of duties on other specified products. In this way German exporters of grain and flour received an export bonus."[77] Agricultural protection in this way also benefited the net exporters of grain, legumes, colza, or rapeseed. The system of import vouchers became "unworkable", according to Friedman, in the summer and fall of 1930 and was subsequently discontinued.[78]

2.3.5 Multilateral Agreements and International Conferences

Multilateral cooperation also picked up again. In June 1925, Germany joined France, Belgium, Luxembourg, and the Saar territory in the Luxembourg agreement that coordinated trade in heavy industry, facilitating German coal exports to France and steel imports from all four other signatories.

74. Becker, *Handlungsspielräume der Agrarpolitik in der Weimarer Republik zwischen 1923 und 1929*, 162.
75. Ibid., 167.
76. Ibid., 169.
77. Friedmann, "German Grain Policies and Prices, 1925-1964," 34.
78. Ibid., 35.

On 8 September 1926 Germany joined the League of Nations.[79] At the Economic Conference in Geneva in May 1927, German representatives pushed for moderate trade liberalisation, albeit carefully in order not upset protectionist France.[80]

In October 1927, another important instrument of trade policy was on the agenda at the International Diplomatic Conference for the Abolition of Prohibitions and Restrictions on Imports and Exports, also held in Geneva. Import bans were still quite prevalent at this time as a means to protect domestic industry. Germany still had import bans on coal, lime-nitrogen, lead oxide, lead carbonate, red lead, raw aluminium, as well as French dyestuffs and exposed film. Ernst Trendelenburg as Germany's representative at the conference, vehemently supported a complete abolition of such bans, but the proposal failed due to the refusal of the United Kingdom to abolish its own import ban on dyestuffs. Germany therefore upheld its ban on coal imports until Britain would be willing to reciprocate.[81] [82] Both coal and dyestuffs were consequently excluded from the compromise reached at the conference. The fact that, for the first time, a binding agreement resulted from a multilateral economic conference made the participants hopeful that a full abolition of import bans would be possible within three years.[83] However, a second attempt in July 1928 failed, because no country was willing to unilaterally liberalise its trade policy.[84]

79. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 75.

80. Ibid., 89.

81. Ibid., 145.

82. This does not mean that no coal was imported to Germany at all but rather that it could only be imported with special permission from the government.

83. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 150.

84. Ibid., 163.

2.3.6 Rapprochement with France, but not with Poland

By 1927, the pressure of the agrarian lobby had begun to increase. To secure the coalition with the DNVP, the government under Chancellor Marx raised tariffs on potatoes, sugar, pork, oats, rye, and maize against the explicit advice of AA and RWM.[85] Meanwhile, the negotiations with France culminated in the first Franco-German trade agreement in 60 years in March 1928, leading to drastically lowered tariffs for machines, metallurgic and electronic goods in France, and for wine, textiles, and porcelain in Germany.[86] The Franco-German treaty had a signalling effect as it established the MFN principle and binding of tariffs as the basis of bilateral trade agreements.[87] For Franco-German relations, Krüger considers the treaty to be of similar importance in the economic sphere as Locarno was in the political.[88] Pohl describes how in the years following the signing of the treaty Germany rose from France's fourth-largest import source to its largest, while France rose from fifth to first place in the German import statistics by 1930.[89] His book gives a detailed account of the negotiations for this treaty beginning in 1924 and stresses the importance of heavy industry in negotiating concessions. A more concise overview is offered by Maier.[90]

The German government reached an agreement with Poland after years of trade war that had been ongoing since 1925, but the draft of a new trade treaty was never ratified by Germany.[91] It would take until 1934 for a formal termination of the tariff war to manifest itself in a new economic treaty,

85. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 115.

86. Ibid., 122-123.

87. Höpfner, *Deutsche Südosteuropapolitik in der Weimarer Republik*, 150.

88. Krüger, *Die Außenpolitik der Republik von Weimar*, 301.

89. Pohl, *Weimars Wirtschaft und die Außenpolitik der Republik 1924-1926: vom Dawes-Plan zum Internationalen Eisenpakt*, 271.

90. Maier, *Recasting bourgeois Europe: stabilization in France, Germany, and Italy in the decade after World War I*, 520-43.

91. S. Kowal, "Der deutsch-polnische Handel, 1900 bis 2006," in *Interesse und Konflikt: zur politischen Ökonomie der deutsch-polnischen Beziehungen, 1900-2007*, ed. D. Bingen et al. (2008), 33.

but at this point it did not achieve any significant improvements in trade. It was the East Elbian agrarian sector in particular that was opposed to opening trade with Poland. The new industrial sectors, in comparison, saw Poland as an important export market and recognised the "complementary" structure of the two economies.[92] The Polish farmers as well as the coal industry were also strongly opposed to liberalisation, fearing the stronger German competition.[93] The fact that it was the Nazis who managed to break through the gridlock may seem surprising given the later invasion of Poland. However, for Hitler, a normalisation of German-Polish economic relations posed a convenient way to both signal the National Socialists' commitment to peace and to supply the *Reich* with agricultural goods and raw materials. For the Nazis this was in no way contradictory to the long-term goal of bringing Polish territory under German control.[94]

2.4 The Protectionist Turn and the Road towards Autarky (1928-1934)

2.4.1 Agricultural Pressure in the Great Depression

Despite the gains of the left-of-centre parties in the Reichstag election of 1928, the protectionist movement grew more influential from the end of the 1929. The alliance between heavy industry and agriculture ended. Since 1927, agrarian interests had, according to Panzer, taken a backseat to those of industry.[95] Now, in light of the agrarian crisis, the East Elbian farmers vocally demanded more protection for the agricultural sector. Already in December

92. Ibid., 37.

93. Krüger, *Die Außenpolitik der Republik von Weimar*, 304-307.

94. H.-E. Volkmann, "Polen im politisch-wirtschaftlichen Kalkül des Dritten Reiches 1933-1939," in *Ökonomie und Expansion*, ed. B. Chiari (Oldenbourg Wissenschaftsverlag, 2009), 214.

95. Panzer, *Das Ringen um die deutsche Agrarpolitik: von der Währungsstabilisierung bis zur Agrardebatte im Reichstag im Dezember 1928*, 156.

1928, Agricultural Minister Dietrich introduced a sugar duty. Tariffs on wheat and rye were raised in early 1929.[96] In December 1929, the government established a sliding tariff on rye, barley, wheat, and maize, allowing tariffs to be increased without passing new legislation. By January 1930, grain tariffs had tripled relative to their levels in the 1925 amendment.[97] Where bilateral treaties included tariff reductions on agricultural goods, those treaties were changed (as was the case for the treaties with Sweden, Finland, France, Switzerland, and Denmark).[98] The resignation of Chancellor Müller and the accession of Heinrich Brüning to the chancellorship led to a right-wing shift in German politics and opened the door to more protectionism. In an unprecedented presidential interference in day-to-day politics, President von Hindenburg explicitly supported the wishes of the agricultural sector for support and demanded that the government act.[99] Martin Schiele, now in charge of the RMEL, immediately initiated a new round of tariff hikes on agricultural products.

The RWM had, in the meantime, kept working on multilateral cooperation with Germany's trading partners. Ernst Trendelenburg attempted to secure a "tariff peace" at the international tariff conference in Geneva in 1930. With the 1925 tariff amendment expiring in that year, some sectors of the German economy were hoping for higher tariffs, which Trendelenburg sought to prevent. After arduous negotiations, the free traders in the German delegation seemed to prevail, with a multilateral treaty signed on 24 March 1930. All 11 signatories, including the most important European trading nations, agreed to not cancel any tariff treaties and thus implicitly not to raise any tariffs. For a few days, it looked like a slide towards extreme protectionism could be averted. However, with the appointment of Heinrich

96. James, *The German slump: Politics and economics, 1924-1936*, 265.

97. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 190-191.

98. Loose, *Deutschlands Handelsvertragspolitik der Nachkriegszeit*, 7.

99. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 221.

Brüning as the new German chancellor only five days later on 29 March, the treaty's ratification in the Reichstag became unlikely. Brüning delayed a vote on it and took the side of his agricultural minister Schiele who had been pushing for more protection, not less.[100]

At this point the direction of German trade policy had already changed. In 1929, Germany aimed to replace binding tariffs with import quotas in treaty negotiations with Sweden and Finland, in what Krüger refers to as the "original sin of German trade policy".[101] Merkenich also considers the amendment to the Swedish treaty in October 1929 to be a "trend reversal" in German trade policy as the government aimed to lift the restriction on grain and pork tariff hikes.[102] The farm lobby, increasingly radicalised, began to demand "not only increased protection and relief from its debts, but a fundamental reorientation in German trade policy".[103] Because of the ineffectiveness of tariffs, the farmers now demanded the introduction of an import quota system for food products.[104] Gessner suggests that from 1930 a "method change" in German trade policy set in as "export pressure" and "import coercion" increasingly influenced negotiations.[105]

Chancellor Brüning was opposed to the MFN principle and used trade policy as "a foreign policy weapon with brutal effect."[106] In the years 1930 to 1932, a series of agrarian tariff hikes followed. Germany at this time was Europe's biggest importer of agrarian products and hence contributed to the worldwide breakdown in international trade, aggravating the crisis in

100. Ibid., 241.
101. Krüger, *Die Außenpolitik der Republik von Weimar*, 493.
102. Merkenich, *Grüne Front gegen Weimar: Reichs-Landbund und agrarischer Lobbyismus 1918-1933*, 208.
103. Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy*, 29.
104. Merkenich, *Grüne Front gegen Weimar: Reichs-Landbund und agrarischer Lobbyismus 1918-1933*, 204.
105. Gessner, "Agrarprotektionismus und Welthandelskrise 1929/32. Zum Verhaltnis von Agrarpolitik und Handelspolitik in der Endphase der Weimarer Republik," 172.
106. Krüger, *Die Außenpolitik der Republik von Weimar*, 536.

other countries.[107] In 1930, Germany re-introduced strict veterinary rules that prohibited the import of beef that was not fresh.[108] Meat imports became "quite negligible": beef and veal imports fell by 96 % between 1929 and 1933.[109] Brüning, while generally supportive of the farmers, refused to get behind quotas though.[110] He was increasingly caught in a conflict between industry and agriculture.[111] The devaluation of sterling in Britain in September 1931 furthermore triggered "panicked protectionist responses," as it led to stronger competition from British exports.[112] A system of export subsidies was established to ensure German producers' competitiveness in 1931/32.[113]

Compared to other countries, quota laws played a relatively minor role in Germany's shift towards protectionism. The already existing quota restrictions on coal and film were modified and quotas for butter, cheese, and hops were established. Oil and fat production was monopolised and imports banned. This small number of steps compares favourably to the "endless lists of trade restrictions" which other countries introduce in the early 1930s.[114]

However, as Germany – and 23 other countries – introduced exchange controls in 1931, multilateral current account clearing became very difficult. A system of bilateralism emerged, in which a balanced trade and current account was enforced with each trading partner individually.[115] A detailed discussion of the exchange controls can be found in the work of Doering[116]

107. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 247-248.

108. L. B. Bacon et al., *World Trade in Agricultural Products: Its Growth; Its Crisis; and the New Trade Policies* (International Institute of Agriculture, 1940), 185.

109. Ibid., 187.

110. Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy*, 29.

111. Gessner, *Agrardepression und Präsidialregierungen in Deutschland 1930 bis 1933: Probleme des Agrarprotektionismus am Ende der Weimarer Republik*, 772.

112. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 310.

113. James, *The German slump: Politics and economics, 1924-1936*, 391.

114. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 310.

115. Ebi, *Export um jeden Preis: die Deutsche Exportförderung von 1932-1938*, 26.

116. Doering, *Deutsche Außenwirtschaftspolitik 1933-1935: die Gleichschaltung der Außenwirtschaft in der Frühphase des nationalsozialistischen Regimes*.

while Teichert[117] discusses the system of clearing agreements introduced to circumvent the currency shortages. Ebi describes how the shift towards bilateralism initially had a dampening effect on world trade as bilateral relations were usually balanced out by a reduction on the export side. Germany moved to a clearing system in trade with most Eastern European states, with Austria, and with Denmark beginning in 1932.[118] The Reichsbank expected that the clearing agreements would reduce payment risk for German exporters, but they could not in fact prevent a breakdown of trade with the affected countries. Ebi points to the 54 % drop in German exports to the Eastern clearing countries between the end of 1931 and the end of 1933, a more severe collapse than seen in overall exports.[119] Payment agreements with North and West European industrial nations followed in late 1932 and early 1933.[120] As Irwin[121] explains, exchange controls were an attempt by the German government to resolve the macroeconomic policy trilemma looming over most countries during the Great Depression: Out of capital mobility, gold standard parity, and an independent monetary policy, only two options were sustainable. The British government, in contrast, chose to abandon gold parity in August 1931. With the German economy rapidly losing gold reserves after Brüning announced a moratorium on reparations payments in June 1931, the government urgently needed to act. The alternatives to ending free convertibility of the Reichsmark appeared even less appealing: Doing nothing would have drained Germany's gold reserves, forced it to default on its debt and "cut [it] off from international capital markets" while devaluation could have made the burden of reparations, which were fixed in gold, insurmountable, essentially leading to the same outcome. With

117. Teichert, *Autarkie und Großraumwirtschaft in Deutschland 1930-1939: Außenwirtschaftspolitische Konzeptionen zwischen Wirtschaftskrise und Zweitem Weltkrieg*, 32.
118. Ebi, *Export um jeden Preis: die Deutsche Exportförderung von 1932-1938*, 27.
119. Ibid., 29.
120. Ibid., 30.
121. D. Irwin, *Trade Policy Disaster: Lessons from the 1930s*, Ohlin Lectures (MIT Press, 2012), 67.

the memory of hyperinflation still fresh, the German government did not dare risk a new spiral of monetary instability.[122]

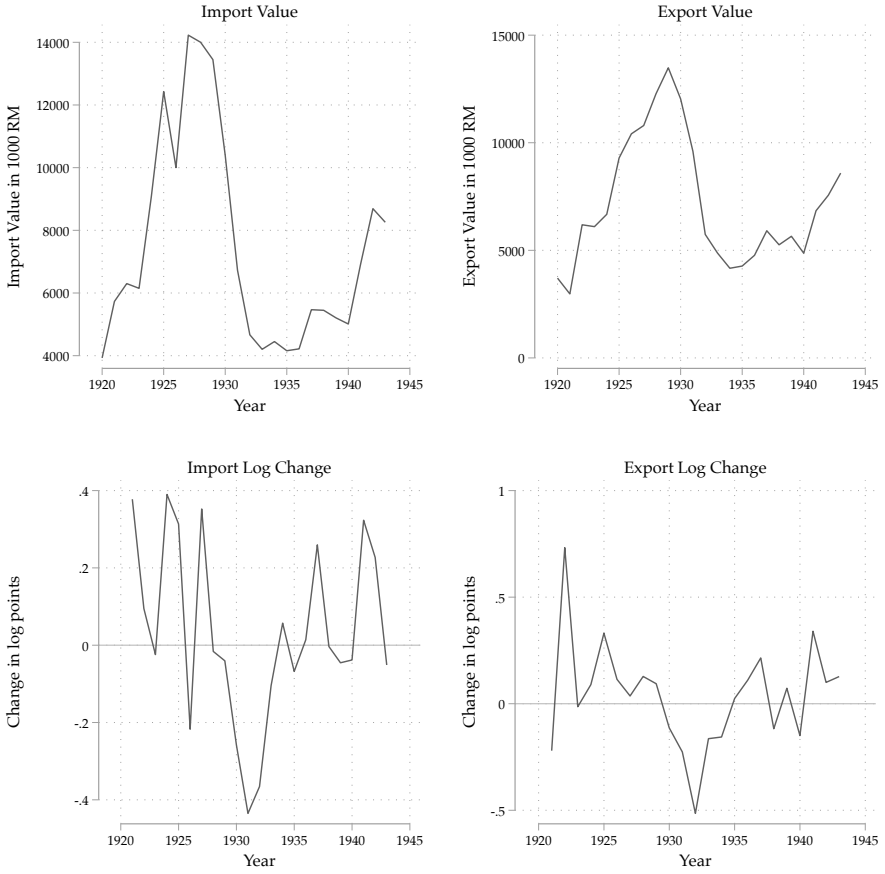
Figure 2.1 illustrates the suddenness and magnitude of the trade collapse that accompanied the Great Depression and this shift towards protectionism. The top graphs show absolute trade values while the bottom graphs show log changes. Import values had peaked in 1927 at approximately 14.2 million RM and within a few years fell to a fraction of their pre-crisis level. They reached their nadir in 1933 at only 4.2 million RM and did not recover by the start of World War II. Exports went through a similar trajectory with a peak of 13.5 million RM in 1929 followed by a sharp decline to 4.2 million in 1934.

2.4.2 The Geographical Shift in German Trade Policy

Around the same time as the protectionist shift, and after the death of Gustav Stresemann as the main proponent of cooperation with France, Germany also experienced a gradual re-direction of its trade from the West to the Southeast. In 1930, the government began negotiations for bilateral preferential treaties with Romania and Hungary in a first step to "flex its commercial muscle in Southeastern Europe".[123] In 1931 negotiations with Austria began to establish a customs union. However, at the point of their ratification in June and July 1931, the two treaties were so full of exceptions that they were "all but dead on arrival". The agricultural lobby had torpedoed trade liberalisation with the East for fear of competition. The exporting sectors, on the other hand, were worried about giving up the more lucrative western markets in a shift towards the Southeast.[124] The customs union with Austria failed when France, wary of a new Greater Germany, made the bailout of the *Kreditanstalt* in 1931 conditional on an abandonment of the plans.[125]

122. Irwin, *Trade Policy Disaster: Lessons from the 1930s*, 68.
123. S. G. Gross, *Export Empire: German Soft Power in Southeastern Europe, 1890–1945* (Cambridge University Press, 2016), 167.
124. Ibid., 176.
125. Ibid., 168.

Figure 2.1: German Annual Trade Values in the Interwar Period



Source: Hoffmann (1965)

The early 1930s also saw the re-emergence of preferential tariffs, i.e. the granting of a tariff discount for some countries but not others.[126] In the treaty with Bulgaria on 24 June, 1932, Germany granted preferences of 75 % on wheat, barley, and maize. A previous attempt at preferential treatment for Romania and Hungary in 1930 had failed due to the veto of other trading partners who insisted on their MFN status. Now, in 1932, Germany explicitly claimed the right to also grant the Bulgarian preferences

126. W. Greiff, *Die neuen Methoden der Handelspolitik* (Junker und Dunnhaupt, 1934), 4.

to those two countries as well as Yugoslavia.[127] Thus Germany began to undermine the widespread system of MFN treaties.

The restrictive German trade policy affected German exports as other countries retaliated. Ebi mentions the butter tariff as a particularly drastic example. In 1932, it included a surcharge of 36 RM per 100 kg for imports from countries with devalued currencies (though it was not applied to British butter), a measure that was harshly criticised abroad.[128] Denmark, for instance., responded with "rigorous restrictions against the import of German industrial products".

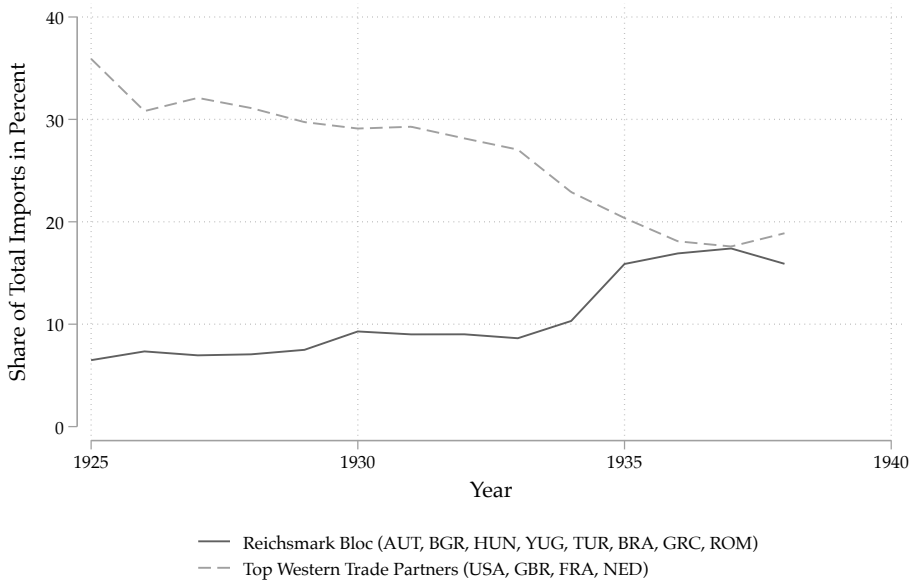
Figure 2.2 shows both the decline of trade with the most important trading partners of the 1920 – France, the UK, The United States, and the Netherlands – and the rise in importance of Southeastern European and Latin American trading partners, specifically Hungary, Romania, Bulgaria, Yugoslavia, Greece, Turkey, Austria, and Brazil. The latter group of countries, which is often referred to as the Reichsmark Bloc accounted for 6.5 % of German imports in 1925 but was able to increase its share, first gradually through the late 1920s and early 1930s, then more suddenly in the mid-1930s. By 1937, 17.4 % of Germany's imports in value terms came from the members of this trade bloc. In comparison, its most important Western trading partners in the 1920s steadily lost importance in the structure of German trade. These four countries alone were responsible for 35.9 % of German imports in 1925 but their importance was greatyl diminished after the Great Depression. By 1937, the share of the four Western nations had dropped to less than half its mid-1920s value and was about on par with the trade bloc share at 17.6.

2.4.3 The Spread of State Control

According to Greiff, tariffs as a protectionist measure became less relevant through the course of the Great Depression in the shadow of other policies.

127. Loose, *Deutschlands Handelsvertragspolitik der Nachkriegszeit*, 8.
128. Ebi, *Export um jeden Preis: die Deutsche Exportförderung von 1932-1938*, 86.

Figure 2.2: The Shift of German Trade from West to East



Sources: Der auswärtige Handel Deutschlands (1928-30), Monatliche Nachweise über den auswärtigen Handel (1931-38)

While other countries, most notably the United Kingdom, devalued their currency in the early 1930s, German instead chose a path of severe price deflation.[129] Both steps improved the respective countries trade balance as they made exports more competitive and imports more expensive.[130] Quotas also became more prevalent. In 1930, the trade treaty with Finland included a clause for an annual import ration of 5000 tons of Finnish butter at a reduced tariff. Other quotas existed for automobiles, frozen meat, and livestock.[131] Some goods were also subject to cartelisation, as was the case for coal from

129. Devaluation did not appear to be a feasible option to the German government for various reasons. It would have raised reparations and foreign debt, and lowered the terms of trade. Germany had committed to gold parity in the Young Plan, and there was widespread fear of inflation and a breakdown of the domestic economy if the Mark was devalued, as Ebi (*Export um jeden Preis: die Deutsche Exportförderung von 1932-1938*, 94) sums up.

130. Greiff, *Die neuen Methoden der Handelspolitik*, 15.

131. Ibid., 22-23.

Czechoslovakia, Belgium and the Netherlands. Iron imports from Poland were cartelised in February 1934.[132]

Trade policy played a minor role under Chancellors Papen and Schleicher.[133] Both refused to give in to agriculture's most extreme demands for discriminatory import quotas. In turn, the farmers abandoned the democratic parties and found a more eager supporter in the National Socialist German Workers' Party. The NSDAP, an explicitly autarkic movement, gained control of the German government in January 1933. The RWM, so far a haven for free-traders, was taken over by Alfred Hugenberg, who pushed for even more agrarian protectionism in particular, and a tariff hike on all imports in general. Preparation for war now became a goal of German trade policy.[134] However, in the first months under Hitler, trade policy had a low priority. When Hugenberg announced at the London economic conference in 1933 that autarky was the ultimate goal of the German Reich, along with a demand for *Lebensraum* in the East, the German delegation declared this to be a "private opinion"[135] and Hugenberg was removed from office.[136] Harold James has argued that in terms of economic policy, "30 January 1933 did not mark a major turning point in Germany's inter-war economic history",[137] that "there existed substantial continuities between the course taken by Weimar's presidential governments and that of the Nationalist-Nazi coalition under Hitler's chancellorship"[138] and that the time when "the rules

132. Greiff, *Die neuen Methoden der Handelspolitik*, 25.

133. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 344.

134. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*; D. Petzina, "Hauptprobleme der deutschen Wirtschaftspolitik 1932/33," *Vierteljahrshefte für Zeitgeschichte* 15, no. 1 (1967): 318.

135. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 325.

136. Gross, *Export Empire: German Soft Power in Southeastern Europe, 1890–1945*, 176.

137. H. James, "Innovation and conservatism in economic recovery: the alleged 'Nazi recovery' of the 1930s," in *Capitalism in Crisis: International Responses to the Great Depression*, ed. W. R. Garside (1993), 71.

138. Ibid.

of the capitalist game were fundamentally altered" was earlier, during the Brüning government in the second half of 1931, with the Nazis inheriting an economy that was already under significant state control.[139] With Germany's gold reserves still under immense pressure and negative trade balances, the Nazi government in 1934 and again in 1936 "faced a choice only in a very fundamental sense: between a continuing and incremental process of detachment from the world economy on the one hand, and reintegration in the international economy on the other. The latter course would mean the end of bliateralisation, the repayment of debts, and the devaluation of the mark to a realistic rate."[140] Hitler's choice to block any devaluation was consistent with the fear of inflation – and the idea that the costs outweighed the benefits of reintegration in the world economy – that had already dominated the economic policy discourse in the Weimar era.[141]

This suggested continuity, however, is primarily one of policy choices rather than one of motivation. While the Nazis made it their explicit goal to detach Germany from trade with Western Europe, the Centre Party, including Heinrich Brüning, was much more ambivalent about the steps taken to restrict the free flow of capital in the early 1930s. A large body of literature, going back to Borchardt,[142] has investigated to what extent Brüning even had a choice in his economic policy decisions or whether his hand was forced by external circumstances (see, for instance, Borchardt[143] and Ritschl[144] for good summaries of this debate). That there was some level of continuity in trade policy until the outbreak of the war is also suggested by Ritschl,

139. Ibid., 92.

140. Ibid., 83.

141. Ibid., 88.

142. K. Borchardt, "Zwangslagen und Handlungsspielräume in der großen Wirtschaftskrise der frühen dreißiger Jahre: zur Revision des überlieferten Geschichtsbildes," in *Bayerische Akademie der Wissenschaften, Jahrbuch 1979* (Vandenhoeck & Ruprecht, 1979).

143. K. Borchardt, "A Decade of Debate about Brüning's Economic Policy," in *Economic Crisis and Political Collapse: The Weimar Republic 1924-133* (1990).

144. A. Ritschl, "Reparation transfers, the Borchardt hypothesis and the Great Depression in Germany, 1929–32: A guided tour for hard-headed Keynesians," *European Review of Economic History* 2, no. 1 (1998): 49–72.

who finds no evidence of exploitation of smaller trading partners in the last years of peace, contrary to the narrative in some of the qualitative literature, and instead suggests that strong ties to Southeastern Europe pre-dates even World War I. He describes the Nazis' approach to trade policy as one of "partial disengagement from Germany's dominant creditor countries, along with the attempt to build up import-substitution industries in the fields of maximum dependence."[145]

Hugenberg's successor Walther Darré was more willing to grant preferential treatment of agricultural imports from Southeastern Europe.[146] Trade treaties with Hungary and Yugoslavia included secret appendices, which provided preferential treatment for agricultural products and raw materials imported to Germany.[147] As trade in the West collapsed during the Great Depression, the exporting industry also "warm(ed) up to the prospect of deeper ties with Southeastern Europe".[148] In August 1933, exchange control was extended to foreign trade and applied according to a categorisation of goods into essential, necessary, and unnecessary. Foreign currency could no longer be allocated to the latter category, and only up to an amount of 10,000 RM in the second one. Allocation to essential goods remained unrestricted.[149]

To simplify this procedure, foreign exchange was allocated based on the demand in the previous quarter from 10 October, 1931.[150] In December 1931 the overall amount of foreign exchange was restricted to 75 % of the original amount, a limit that could only be exceeded in cases of emergency. This value was further lowered in several steps to 50 % by May 1932, to

145. Ritschl, "Nazi economic imperialism and the exploitation of the small: evidence from Germany's secret foreign exchange balances, 1938-1940," 344.

146. Gross, *Export Empire: German Soft Power in Southeastern Europe, 1890–1945*, 176.

147. W. Grenzebach, *Germany's Informal Empire in East-central Europe*, v. 2 (1978); D. Kaiser, *Economic Diplomacy and the Origins of the Second World War: Germany, Britain, France, and Eastern Europe, 1930-1939*, Princeton Legacy Library (Princeton University Press, 1980).

148. Gross, *Export Empire: German Soft Power in Southeastern Europe, 1890–1945*, 176.

149. James, *The German slump: Politics and economics, 1924-1936*, 387.

150. Ebi, *Export um jeden Preis: die Deutsche Exportförderung von 1932-1938*, 22.

25 % by May 1934, and then to 10 % in June 1934.[151] These drastic measures, however, could not prevent the stock of foreign exchange from dwindling. In consequence, the system was changed again so that from June 1934, the Reichsbank only gave out at most as much foreign exchange as it received on each day.[152] A detailed description of the regulatory changes regarding exchange controls can be found in the work of Diehl.[153]

2.4.4 The "New Plan"

The autarkic offensive and push towards a zone of influence in Eastern Europe eventually became a core policy goal with the "New Plan" of Hugenberg's successor Hjalmar Schacht in 1934.[154] A series of bilateral agreements with Southeastern states was the result. Through the late 1920s and early 1930s, many former proponents of free trade began to see trade policy as an instrument of geopolitics. Gross describes how men like Max Hahn, Hans Posse, and Julius Curtius "hoped that (...) Germany would undermine Yugoslavia's and Romania's diplomatic ties to France and dismantle the collective security framework established by the Treaty of Versailles".[155] The resulting shift away from the West can be seen in the share of American imports to Germany, once its biggest trading partner. Still at 17.8 % in 1925, it dropped to 13.3 % in 1929, 11.5 % in 1933, and 5.2 % in 1937.[156] Milward emphasises that the post-WWII relations between West Germany and the United States are more in line with the Weimar numbers. In 1950

151. Ibid., 23.

152. Ibid., 24.

153. M. Diehl, *Von der Marktwirtschaft zur nationalsozialistischen Kriegswirtschaft: die Transformation der deutschen Wirtschaftsordnung 1933-1945*, Beiträge zur Wirtschafts- und Sozialgeschichte (Steiner, 2005), 40.

154. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 325.

155. Gross, *Export Empire: German Soft Power in Southeastern Europe, 1890–1945*, 177.

156. A. Milward, "Der deutsche Handel und der Welthandel 1925-1929," in *Industrielles System und politische Entwicklung in der Weimarer Republik*, ed. B. Petzina Dietmar und Weisbrod (Athenäum-Verlag, 1977), 484.

imports from the US were back to 15.3 %.[157] He considers the Nazi era as a distinct break from the trend, though the numbers he cites actually show that the trend had turned around long before the Nazis came to power.[158] The US clashed with Germany in their push for multilateralism and free trade, at odds with German bilateralism. Germany withdrew from the Treaty of Trade and Friendship with the United States. The US consequently stripped Germany of its MFN status.[159] The demand for raw materials was afterwards mostly satisfied with imports from Southeastern Europe and Latin America. Trade agreements with Hungary and Yugoslavia were passed in February and March 1934. Chile became an important source of saltpetre and copper, Brazil supplied coffee and cotton.[160] Trade policy was now aimed at minimising German imports while still satisfying the requirements of rearmament.[161] Economic goals were subordinated to the concept of *Großraumwirtschaft* (large-area economy): a continental economic zone and the economic equivalent to the *Lebensraum* concept.[162] Schacht, expecting a backlash from the international community, defended the paradigm shift in trade policy with the necessity of ensuring Germany's supply of food and raw materials after the Great Depression.

On 24 September, 1934, the New Plan came into force. It included decrees that allowed the RWM to directly control the flow of goods and make decisions on their "acquisition, distribution, storage, sales and consumption".[163] Control of agricultural goods was assigned to the RMEL. The RWM was furthermore authorised to establish inspection agencies, which subsequently executed the supervisory powers of the ministry, granted import allowances, and allocated

157. Milward, "Der deutsche Handel und der Welthandel 1925-1929," 476.
158. Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy*, 88.
159. Ibid., 87.
160. Ibid., 88.
161. W. Boelcke, *Die Deutsche Wirtschaft 1930-1945: Interna des Reichswirtschaftsministeriums* (Droste, 1983), 102.
162. Ibid., 103.
163. Ebi, *Export um jeden Preis: die Deutsche Exportförderung von 1932-1938*, 128.

foreign exchange.[164] Agricultural importers and the German military were granted priority in the allocation. 1934 thus saw a further protectionist shift in German trade policy as it moved from already very constrained free trade (due to exchange control and bilateralism) to highly invasive state control, and from the primacy of exports to that of imports.[165]

The tariff on wheat reached 35 Reichsmark per 100 kilograms in October 1934 and remained there for the remainder of the interwar period. Bacon et al.[166] call the tariff "absolutely prohibitive" with the "general rate exceed[ing] domestic prices by about three-fifths."[167] Permits were also required, milling taxes were charged, and compuslory deliveries and compulsory storage were enforced. With these measures in place, trade policy now primarily served the Nazi goals of autarky and rearmament and did not change course again until after World War II. Volkmann[168] points out the "antinomy" of these two goals: decreased dependence on foreign markets on the one hand, increased supply of foreign raw materials for the military-industrial complex on the other – suggesting that the strive towards autarky inevitably led to imperialism and *Großraumwirtschaft*.

164. Ibid., 129.

165. Boelcke, *Die Deutsche Wirtschaft 1930-1945: Interna des Reichswirtschaftsministeriums*, 104.

166. Bacon et al., *World Trade in Agricultural Products: Its Growth; Its Crisis; and the New Trade Policies*, 42.

167. This rate did not apply to wheat imported by the National Grain Office which only paid 1 RM per 100 kilograms leading to a de facto monopoly on wheat imports.

168. H.-E. Volkmann, "Außenhandel und Aufrüstung in Deutschland 1933-1939," in *Ökonomie und Expansion*, ed. B. Chiari (Oldenbourg Wissenschaftsverlag, 2009), 130.

3

The Shift towards Protectionism in the Weimar Republic and the Political Economy of German Trade Policy

3.1 Introduction

Germany underwent several drastic political re-alignments in the interwar period even before the end of democracy and the Nazis' rise to power. Liberal, centrist, and left-wing voices represented in the "Weimar Coalition" were increasingly marginalised in Reichstag elections while nationalists – and eventually National Socialists – became more powerful. To what extent do these political shifts reflect economic interests? Previous research has

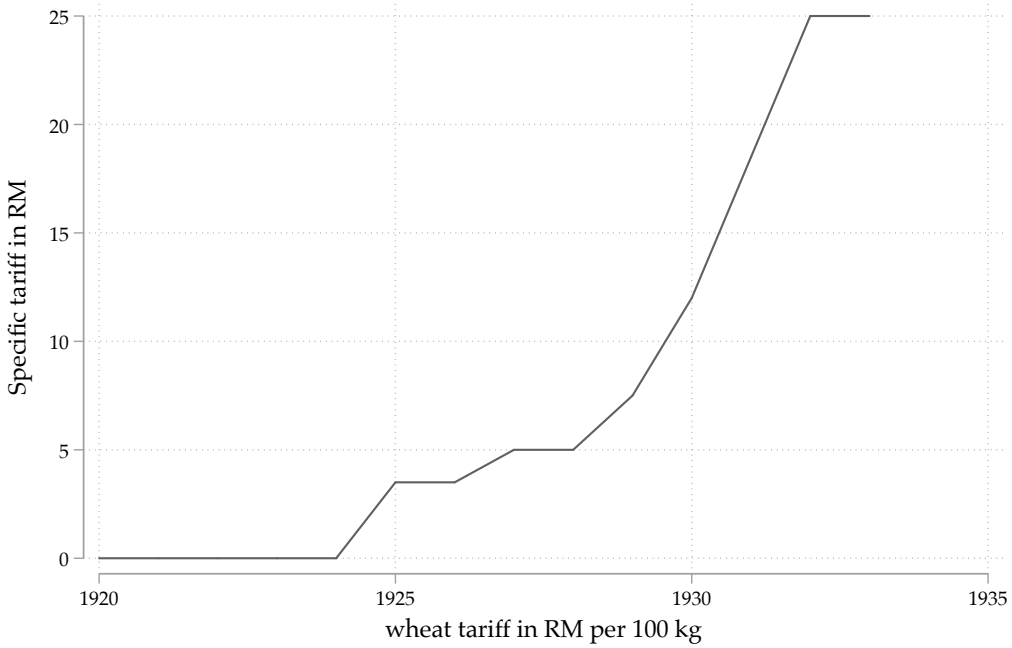
shown that socio-economic factors played an important role but the role of one of the most important aspects of interwar economic policy, trade policy and the sudden shift towards protectionism in the Great Depression, has remained understudied. The goal of this chapter is to shed light on how voting behavior reflected trade policy interests.

The interwar era was a time of rising protectionism. This is particularly true in Germany where a brief period of relatively liberal trade policy and economic reconciliation with neighbour countries abruptly ended in the late 1920s with the introduction of skyrocketing tariffs, in particular for agricultural goods. Since almost all tariffs were set specifically rather than *ad valorem*, the severe deflationary forces of the time multiplied the effect of protectionist policy, resulting in tariffs as high as 200 % on goods such as wheat or rye as shown in figures 3.1 and 3.2.[1]

Between 1925 and 1928 Germany seemed to be on a, if not liberal, at least only moderately protectionist path. In 1927, the first trade treaty with France, the long-time nemesis, seemed to be a sign of a paradigm shift in the two countries' relations. However, as the agrarian crisis worsened this new path was no longer sustainable and the political forces that favoured protectionism, notably the German Nationalist People's Party or DNVP and later the Nazi Party, the NSDAP, prevailed. This raises the question of how this radical change in policy became possible. The existing literature ascribes this development to a radicalisation of the agrarian base which was represented by the influential *Reichslandbund* organisation. Simultaneously the vote share of right-wing parties with protectionist platforms in parliamentary elections increased sharply. It is not clear, however, to what extent this electoral trend reflected or was consistent with individual trade policy interests. Did the population as a whole or did specific groups become more protectionist? Was

1. Calculations of *ad valorem* equivalents are based on unit values included in the official German trade statistics of the time, *Der auswärtige Handel in den Jahren 1925-1927* and *Monatliche Nachweise über den auswärtigen Handel Deutschlands*. Specific tariffs are from the official legislative publication, the *Reichsgesetzblatt*.

Figure 3.1: Specific tariff on wheat in Reichsmark by year



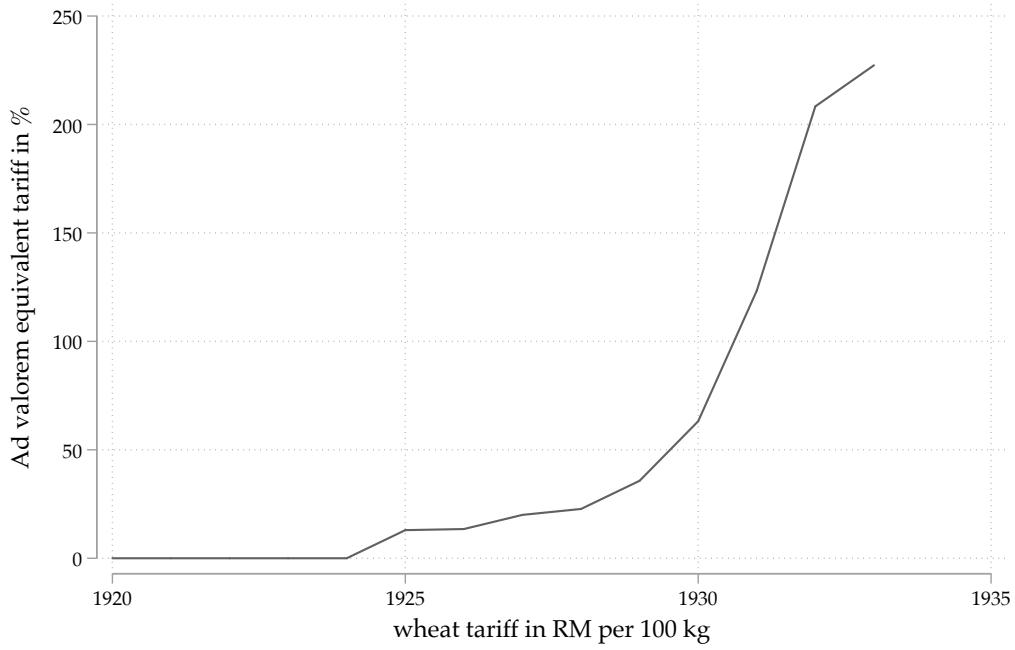
Sources: Der Auswärtige Handel Deutschlands (1928-1930), Monatliche Nachweise über den auswärtigen Handel (1931-1938)

there a shift in voter turnout towards more protectionist-minded groups? Was there a united front of agriculture in favour of higher tariffs despite potentially diverging interests between grain-producing landlords and peasants in livestock farming? Or did the radicalisation of agriculture only occur in those parts of the country where grain-farming was dominant? Finally, what role did voters in non-agricultural sectors play? To what extent did the industrial vote split according to their trade policy interests as predicted by economic theory? Or did protectionist parties get more votes for other, non-trade-related, reasons? These are questions that I will address in this chapter.

I bring together three different data sets for this. The first is election data for the Weimar Republic collected at district level for the years 1924 to 1933.[2] The second is data on the agricultural structure at district level

2. I ignore the 1920 Reichstag election as district borders were very extensively redrawn after that election making an aggregation at a consistent level very difficult. It is also less

Figure 3.2: *Ad valorem* equivalent tariff on wheat in per cent



Source: Der Auswärtige Handel Deutschlands (1928-1930), Monatliche Nachweise über den auswärtigen Handel (1931-1938)

in the 1925 census as collected in the *Statistik des Deutschen Reichs*, volume 412.[3] This gives me information on the population working in agriculture disaggregated by the size of farms in hectares. It also includes the number of farm animals held in each district, which allows for a more precise distinction between livestock and grain-farming than mere farm size. The third data set describes the structure of industry in each district and lists how many people were employed in each sector and is also based on the 1925 census. I make use of a disaggregation into 26 industrial sectors which is sufficiently fine-grained to distinguish between exporting and importing sectors.[4]

relevant for trade policy because Germany's ability to change its tariffs was restricted by the Treaty of Versailles until 10 January, 1925.

3. Statistisches Reichsamt, *Statistik des Deutschen Reichs 412: Landwirtschaftliche Betriebszählung* (1929).

4. Statistisches Reichsamt, *Statistik des Deutschen Reichs 403: Berufszählung Ost- und Mitteldeutschland* (1929); Statistisches Reichsamt, *Statistik des Deutschen Reichs 404: Berufszählung*

In order to answer the questions outlined above I employ King's algorithm of ecological inference, a well-tested and widely used method to extract individual-level information from aggregate data.[5] King et al. themselves have used this method for the Weimar election data, albeit with a focus on the vote for the Nazis.[6] This allows me to draw conclusions about what the turnout among specific economic groups was and how strongly they voted in favour of free trade or protectionism. The benchmark paper for the methodology used is by Lehmann,[7] who conducted a similar analysis for the first big protectionist shift in Germany, the "Marriage of Iron and Rye" under Bismarck.

I find that there was no unified agricultural bloc with regards to protectionist voting. After the onset of the agrarian crisis in 1928, agriculture as a whole was more inclined to vote protectionist than the average population. But once I further disaggregate the agricultural sector, I find a wedge between those working on large farms which predominantly produced grain and leaned more towards protectionism, and those working in small-scale pig farming who leaned more towards liberal and moderate free-trade-supporting parties. Cattle farmers in contrast voted with the protectionist large estates in the early 1930s. Furthermore, the increase in agricultural turnout is not sufficient to explain the shift towards more protectionist parties as it follows a parallel track with the general turnout. In the industrial sectors, trade exposure was associated with differences in the degree of the protectionist shift and mostly follows the expectations of trade theory and the interests represented by lobbying organisations. Protectionist vote estimates are highly negatively correlated with both the relative trade balance and the export share of

Nord- und Westdeutschland (1929); Statistisches Reichsamt, *Statistik des Deutschen Reichs 405: Berufszählung Süddeutschland und Hessen* (1928).

5. G. King, *A solution to the ecological inference problem: Reconstructing individual behavior from aggregate data* (Princeton University Press, 1997).

6. King et al., "Ordinary economic voting behavior in the extraordinary election of Adolf Hitler."

7. Lehmann, "The German elections in the 1870s: why Germany turned from liberalism to protectionism."

production, indicating that people who worked in export industries were less likely to vote for protectionist parties while people employed in sectors facing import competition were much more likely to do so.

Before I proceed to analyse the role of trade policy for voting behaviour in the Weimar Repubic, we need to look closer at the historical context in which these voting decisions were made, what interests different economic sectors should pursue according to economic theory and what the political environment was in which decisions on trade policy were made. The chapter therefore proceeds as follows: Section 3.2 lays out an overview of the relevant literature on trade policy interests and on Weimar election analysis more broadly. In section 3.3, I present the theoretical foundations of the political economy of trade policy in Weimar Germany as well as historical context for the positions of the political parties in this framework. Section 3.4 contains an explanation of the political system of the Weimar Republic. Section 3.5 makes the case for the relevance of trade policy in 1920s and 1930s election campaigns. Section 3.6 summarizes the data sources. Section 3.7 explains the concept of ecological inference and how King's algorithm solves the problem. Section 3.8 presents the results and section 3.9 concludes.

3.2 Literature Review

3.2.1 Trade Policy

The classic account of the political economy of German interwar trade policy can be found in Alexander Gerschenkron's *Bread and Democracy in Germany*.[8] He depicts the Prussian Junkers, rich landlords in the territories east of the river Elbe, as the dominant political power in Weimar Germany and the Reich Agrarian League (*Reichslandbund*, RLB), the major agricultural lobbying

8. Gerschenkron, *Bread and Democracy in Germany*.

organisation, as their political arm.[9] In a chapter aptly titled "Junkers versus Republic" Gerschenkron lays out how the Junkers' political power survived World War I almost unscathed and how they managed to retain their firm hold on German politics and ultimately undermine the stability of the republic opening the door to the Nazis. When the Great Depression hit Germany, the peasants were "driven into a frenzy."[10] The RLB pushed for a policy of agricultural autarky from 1931 and found a willing respondent in the newly insurgent National Socialist German Workers' Party (NSDAP).

Schulz[11] and Stegmann[12] give overviews of the trade policy interests in industry. The representatives of the chemical, electric, optical and toy industries, machinery manufacturing, lignite mining and parts of the textile sector hoped to profit from a reduction of trade frictions thanks to their international competitiveness. On the other hand, heavy industry, the producers of iron, steel and coal, were opposed to free trade and supported the position of agriculture. The iron and metal production remained a net importing sector during this period. The mining industry's trade balance was close to zero but the coal industry already profited from a high degree of protection from the start of the period. Germany had lost large parts of its heavy industry as a result of the territorial losses in the Treaty of Versailles: These territories, in particular the Saar, Upper Silesia and Alsace-Lorraine, accounted for three quarters of German iron ore and one quarter of its coal deposits. Its most important foreign sources of raw iron in 1929, for instance, were the Saar Territory and France, ahead of the United Kingdom and Sweden.

9. Ibid., 105.

10. Ibid., 145.

11. Schulz, *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*, 60.

12. Stegmann, "Deutsche Zoll- und Handelspolitik 1924/5-1929 unter besonderer Berücksichtigung agrarischer und industrieller Interessen."

France alone accounted for almost 8,000 of the total of 18,000 tones of raw iron imports, the tiny Saar Territory for more than 2,000.[13]

Gessner[14] ascribes the moderate compromise in trade policy in 1925 to a relatively weak agrarian lobby at the time. In the years between 1925 and 1928 there was a broad consensus that the German economy was dependent on the global market.[15] A broad body of literature has focused on the role of industry-specific lobbying organisations, such as works by Merkenich[16] and Becker[17] on agricultural interest groups, Wolff-Rohé[18] and Neebe[19] on the Reich Industrial Association (RDI). However, the focus in all of these works is entirely on the positions of lobby groups and politicians rather than on the general population.

Tooze[20] briefly touches on the topic of Weimar trade policy and identifies a clear culprit for the radical shift: "In so far as economic interests were responsible for the collapse of the Weimar Republic and the installation on 30 January 1933 of Hitler's government, the group chiefly responsible was not big business or even heavy industry, but Germany's embattled farmers." He describes how the farm lobby, increasingly radicalised during the Great Depression, tried to push chancellors Brüning, Papen, and Schleicher towards an even more rigid protectionism including a system of quotas and discrimination between individual trading partners. When neither of the three was willing to go that far despite their general support of the

13. Statistisches Reichsamt, *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1929* (Reimar Hobbing, 1930).

14. Gessner, *Agrardepression und Präsidialregierungen in Deutschland 1930 bis 1933: Probleme des Agrarprotektionismus am Ende der Weimarer Republik*.

15. Ibid., 31.

16. Merkenich, *Grüne Front gegen Weimar: Reichs-Landbund und agrarischer Lobbyismus 1918-1933*.

17. Becker, *Handlungsspielräume der Agrarpolitik in der Weimarer Republik zwischen 1923 und 1929*.

18. Wolff-Rohé, *Der Reichsverband der Deutschen Industrie 1919-1924/25*.

19. Neebe, *Großindustrie, Staat und NSDAP 1930-1933: Paul Silverberg und der Reichsverband der Deutschen Industrie in der Krise der Weimarer Republik*.

20. Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy*, 29.

agricultural lobby, the agrarian representatives turned against the republic for good: "In early 1933 key leaders of the agrarian lobby intervened decisively with President Paul von Hindenburg, himself the owner of a large estate, to push him towards accepting a coalition between Hugenberg's DNVP and Hitler's Nazi party."[21]

3.2.2 Election Analysis

Weimar election data have been used as a source by historians for decades (one notable example is the city level case study approach by Hamilton[22]) but a systematic approach making use of economic geography and advanced statistical methods was first applied by O'Loughlin et al.[23] They investigate spatial autocorrelation in the Nazi vote during the Reichstag election of 1930. They find regional differences in the structural voting patterns and emphasise the role of local circumstances for the voting decision. The inclusion of geography "substantially increased the explanatory value" of the models. The authors conclude that the Nazi electorate was not homogenous and that studying subgroups of the population without acknowledging spatial differences is an approach prone to bias. One central finding concerns the positive relationship between a rise in turnout and an increase in the Nazi vote indicating the "mobilization of non-voters (as) an important component of the Nazi electorate."[24]

21. Ibid., 30.

22. R. F. Hamilton, *Who voted for Hitler?* [In eng], Princeton legacy library (Princeton, N.J.: Princeton University Applied Mathematics Research eXpress, 1982).

23. J. O'Loughlin et al., "The geography of the Nazi vote: Context, confession, and class in the Reichstag election of 1930," *Annals of the Association of American Geographers* 84, no. 3 (1994): 351–380; J. O'Loughlin et al., "Regions and Milieux in Weimar Germany: The Nazi Party Vote of 1930 in Geographic Perspective (Regionen und Milieus in der Weimarer Republik: Wählerstimmen im Jahr 1930 für die NSDAP aus geographischer Sicht)," *Erdkunde*, 1995, 305–314.

24. O'Loughlin et al., "The geography of the Nazi vote: Context, confession, and class in the Reichstag election of 1930," 373.

The field was advanced a lot by the publication of King's book on his solution to the ecological inference problem in 1997.[25] In two follow-up papers, O'Loughlin and his co-authors applied King's algorithm to the Weimar election data to say more about who voted for the Nazi party. They find evidence of strong Nazi support among Protestants relative to Catholics, low support among the working class relative to the left-wing parties, a drop in support among the unemployed between 1930 and 1932 when they "reasserted their support for the Social Democratic and Communist parties," and high Nazi support among women in the labour force relative to non-working women.[26] They also reaffirm their argument that the "Weimar German electoral map does not show much evidence of a nationalized electorate, but is better characterized as a mosaic of support for 'milieu parties', mixed across class and other social lines."[27] They praise the quality of the available data for Weimar Germany, which "exceeds in coverage and detail the data files for contemporary societies in its geographic coverage, small scale, and temporal match between census and electoral data," but also conclude that "searching for a single explanation (a univariate model) of the Nazi phenomenon is likely to prove to be a futile endeavor."[28] They find, for example, that while Protestant support for the Nazis was higher than the average, it ranged from 4 to 51 % with very little autocorrelation.[29] This is in contrast to the strong spatial autocorrelation of the Nazi vote in general which implies an important role of geography.[30]

25. King, *A solution to the ecological inference problem: Reconstructing individual behavior from aggregate data*.

26. J. O'Loughlin, "Can King's ecological inference method answer a social scientific puzzle: Who voted for the Nazi party in Weimar Germany?," *Annals of the Association of American Geographers* 90, no. 3 (2000): 592–601.

27. J. O'Loughlin, "The electoral geography of Weimar Germany: exploratory spatial data analyses (ESDA) of protestant support for the Nazi Party," *Political Analysis* 10, no. 3 (2002): 217.

28. Ibid., 240.

29. Ibid., 237.

30. Ibid., 230.

King himself and his co-authors investigated the Weimar elections and found the voting behaviour of the period that led to the rise of the Nazis to be "ordinary" in comparison to other elections.[31] Germans generally voted according to their individual interests. The authors contradict the narratives of a Nazi victory secured by a core voting group of either blue-collar workers and the unemployed or the upper-class elites. They find that "the majority of social groups swung in the same direction and approximately the same amount", but that the working poor[32] disproportionally supported the Nazis, though less so in Catholic precincts. The unemployed, on the other hand, supported the Communists. King et al. emphasise the role of the Nazi agricultural policies that would have been unattractive to voters in the West and South.[33] They point out a gap in the literature with regards to the role of trade: "(O)ne interesting future research question is whether the population of export-dependent areas voted less (...) for the Nazis."[34] More recently, Thurner et al.[35] have analysed agricultural voting behaviour in the Weimar Republic. They emphasise that "the size of farms constitutes the fundamental factor of rural stratification" and that farm size "provides a reliable proxy" for specialisation. They explicitly contradict earlier work by Falter[36] who saw no relationship between farm size and Nazi votes and argue that it was primarily medium-sized farms who shifted towards the Nazis in the early 1930s. They find the effect for the first time in the July 1932 election.

31. King et al., "Ordinary economic voting behavior in the extraordinary election of Adolf Hitler," 951.

32. The working poor under the definition used by King et al. comprise "the self-employed (...), the independent artisans, shopkeepers, small farmers, lawyers, etc." They are not to be confused with the working class as it is mentioned in O'Loughlin's findings.

33. King et al., "Ordinary economic voting behavior in the extraordinary election of Adolf Hitler," 987.

34. Ibid., 988.

35. P. W. Thurner et al., "Agricultural structure and the rise of the Nazi Party reconsidered," *Political Geography* 44 (2015): 50–63.

36. J. W. Falter, "Wählerbewegungen zur NSDAP 1924–1933. Methodische Probleme—abgesicherte Erkenntnisse—offene Fragen," in *Wählerbewegungen in der europäischen Geschichte*, ed. O. Busch (Berlin: Colloquium Verlag, 1980), 152–202.

Various researchers have since looked at a range of factors that may have influenced voting behavior in the Weimar Republic, from the Great Depression itself[37] to the radicalization of WWI veterans[38] and the introduction of austerity policies.[39]

An application of King's algorithm specifically to the field of trade policy can be found in the work of Lehmann.[40] She investigates the German elections in the 1870s when a first shift away from free trade towards high tariffs occurred, carried, according to the traditional narrative, by a "marriage of iron and rye", a political alliance between heavy industry and large-scale agriculture forged by Chancellor Otto von Bismarck. This was part of a worldwide backlash to globalisation and Germany was very much "at the forefront" of this development.[41] Lehmann looks at the electoral shift between 1877 and 1878 when the free trade liberals lost their majority in the Reichstag. She finds that while there was a large number of new voters from the agricultural sector, these were not sufficient to explain the protectionist shift, but that it rather was floating voters from agriculture who tilted the balance.[42] She also finds that within the agricultural bloc, the vote was not homogenous, but that "small farmers preferred free trade, while farmers owning large estates and workers on these estates favored protection," a result that confirms the specific factor model predictions of trade policy interests.[43] Furthermore, voting decisions in the 1878 election (though not in 1877) mostly followed sectoral interests in trade policy outside agriculture. Just like in

37. C. Stögbauer, "The radicalisation of the German electorate: Swinging to the Right and the Left in the twilight of the Weimar Republic," *European Review of Economic History* 5, no. 2 (August 2001): 251–280.

38. C. Koenig, "Loose cannons – war veterans and the erosion of democracy in Weimar Germany," *Warwick Economics Research Paper Series*, no. 1079 (2015).

39. G. Galofré-Vilà et al., "Austerity and the Rise of the Nazi Party," *The Journal of Economic History*, 2021, 1–33.

40. Lehmann, "The German elections in the 1870s: why Germany turned from liberalism to protectionism."

41. Ibid., 146.

42. Ibid., 174.

43. Ibid., 171.

the Weimar era, however, religious denominations strongly shaped voting behaviour, and the protectionist vote is highly dependent on the share of Catholics in a district who show strong loyalties to the Centre party and therefore are less likely to vote protectionist. Klug[44] in contrast finds Catholic support for protectionism in the 1878 election. He finds no evidence of a cleavage based on factors of production as predicted by the Rogowski model and finds economic interests reflecting trade balances and export dependence as the driving force in the 1877 election, but not the one in 1878.[45]

3.3 The Political Economy of Trade Policy

3.3.1 Trade Policy Interests

Figure 3.3 shows the trade balances of various economic sectors in the years 1927, 1929, and 1932. They are based on the statistics published in *Der auswärtige Handel Deutschlands in den Jahren 1925-27*. I have aggregated them into categories roughly corresponding to the economic sectors in the industrial data. For an explanation of which subcategories are contained in each sector, see section A.1 in the appendix. The figure shows that Germany ran a trade deficit in agriculture, fishing, iron and metal production, textiles, timber and wood products, and food and beverages. In contrast, there are consistent export surpluses in nonmetallic mineral production, metalwares, machinery, electronics, chemicals, paper, leather, and toys. Only three sectors see the sign of their trade balance change over this period: mining, where the surplus turns into a deficit, then back into a surplus, as well as rubber and clothing, where a deficit becomes a very small surplus.

44. A. Klug, "Why Chamberlain failed and Bismarck succeeded: The political economy of tariffs in British and German elections," *European Review of Economic History* 5, no. 2 (2001): 219–250.

45. Ibid., 246.

These trade balances mostly fit the prediction of the Heckscher-Ohlin theorem that a country will primarily export goods from sectors which use the country's abundant factor intensively and import goods from sectors which use its scarce factor intensively. Germany as a highly industrialised and densely populated economy would have been capital- and labour-abundant and land-scarce. According to Rogowski[46] it was the European economy with the fourth-highest per-capita production of pig iron, the third-highest of raw steel, and the fifth-highest of electric power (out of a list of 21 countries). Accordingly, Germany imported agricultural products and exported capital-intensive manufacturing goods like electronics and chemicals (but not textiles, clothing, iron and metal). Rogowski predicts a rural-urban conflict in this case as a consequence of the trade slump in the 1930s.[47]

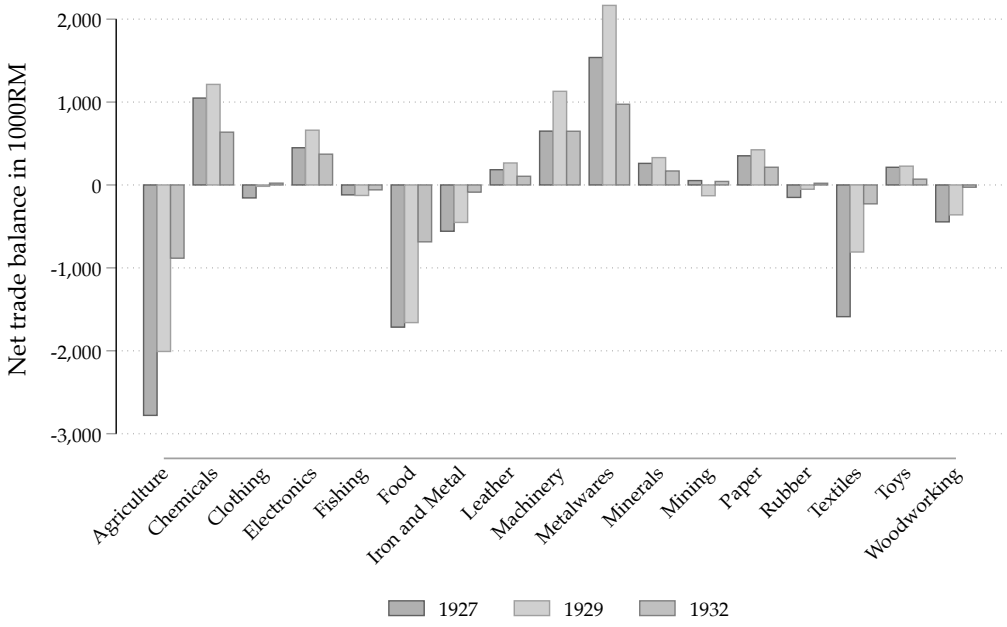
Based on a specific factor model where labor is immobile between sectors, we would expect that voters in sectors which are net importers will be supportive of higher tariffs because the foreign competitors drive down prices and consequently their wages. Voters working in net export industries will be in favour of free trade as they benefit from exporting to foreign countries and will fear retaliation in a trade war. Alternatively, the Stolper-Samuelson theorem relied upon by Rogowski, which assumes mobile factors, predicts that a more liberal trade policy regime would lead to an expansion of the capital- and labour-intensive sectors and a shrinking of the land-intensive ones. Trade liberalisation would raise the marginal product of capital and labour while lowering the returns to land.[48] We should therefore see a disproportionally low vote for protectionist parties across all industrial sectors as the voter groups employed in these sectors consist primarily of the working class, the owners of labour, and the industrialists, the owners of capital. In

46. R. Rogowski, *Commerce and Coalitions: How Trade Affects Domestic Political Alignments*, Political science (Princeton University Press, 1990), 66.

47. Ibid., 86.

48. Ibid.

Figure 3.3: Trade balance of economic sectors in 1000 Reichsmark corresponding to the employment categories in table 3.2



Source: Der Auswärtige Handel Deutschlands (1928-30), Monatliche Nachweise über den auswärtigen Handel (1933)

both models voters in agriculture would lean protectionist: the sector is both exposed to strong import competition and relatively land-intensive.

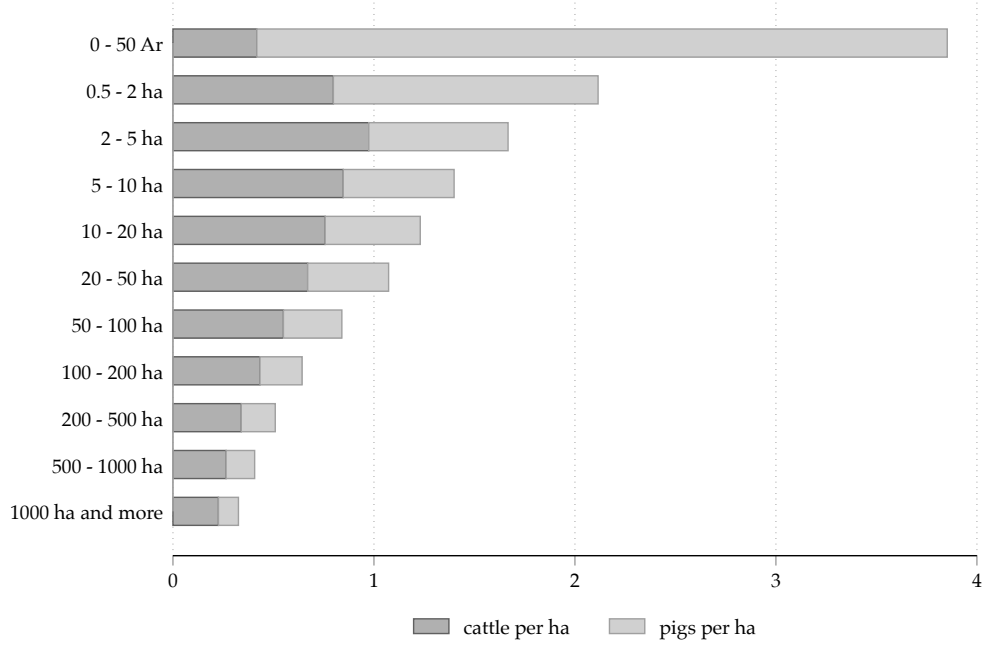
However, the story becomes more complicated if we consider reliance on imported production inputs. In the case of agriculture, the large grain farmers should be opposed to free trade as they do not rely heavily on any input commodities (with the possible exception of fertilisers). Their main input factor is the land itself. On the other hand, small livestock farmers should be more divided. They would profit to some extent from higher agricultural tariffs if these apply to animal products and thus prevent cheap imports of, for instance, Polish pork or Finnish butter. However, one of their main input resources is fodder and they would therefore be harmed by higher grain prices. The split between livestock and grain farmers is

strongly correlated with farm size as the nationwide statistics show: German farms larger than 100 hectares account for 20.2 % of agricultural land but only own 14.7 % of the pasture and meadows, 10 % of the cattle and 6.7 % of the pigs. In contrast 37.8 % of all pigs are held in farms smaller than 5 hectares which only account for 17 % of the land.[49] Figure 3.4 illustrates these differences and shows that the number of livestock per hectare of farm land was decreasing with the size of the farm. Moreover, even within the group of small-scale livestock farmers individuals might not vote in a homogenous pattern. Dairy farmers could have very different trade policy interests than pig farmers as they face varying degrees of import competition and varying levels of tariff protection. One difference between cattle and pigs is that the former could be kept grazing on pasture or fed hay. This is evident in the agricultural data where the number of cattle per hectare of agricultural land in each district is highly correlated with the percentage of this land that is pasture ($r = 0.69$) while there is no such correlation for pigs ($r = -0.14$). Cattle farmers would therefore be less dependent on access to cheap grain fodder and would be more inclined to vote for protectionism. Moreover, pigs were also fed dairy products which further contributed to a potential conflict of interest between cattle and pig farmers.[50]

49. Statistisches Reichsamt, *Statistik des Deutschen Reichs 412: Landwirtschaftliche Betriebszählung*.

50. The Saxonian State Institute for agriculture cites the average daily fodder ration for pigs with an average weight of 69kg in the 1930s (based on the research of the "pig control club", a breeders' association, in Löbau) as 781g grain (of which 70 % barley, 16 % rye), 133g protein fodder (of which 71 % fish meal, 14 % soy), 521g milk, 1121g whey, and 4090g potatoes (see Sächsische Landesanstalt für Landwirtschaft, "Zur Entwicklung der Schweinezucht und -production im Land Sachsen 1850-2000," *Schriftenreihe der Sächsischen Landesanstalt für Landwirtschaft* 8, no. 1 (2003):) A similar study for the province of Hannover found that pigs with a weight between 50 and 70 kg required 3.49kg rye and barley, 0.16kg fish meal, 0.10kg soy, 2.72kg and 0.40kg protein for each kilogram of weight gained. The diet of cattle, on the other hand, was described by the Handbook of Agriculture, a German practicitioner's guide from 1929, as "green fodder, hay, straw, husk, factory waste products and turnips, possibly also potatoes" (see J. Hansen, *Besondere Tierzuchtlehre*, ed. F. Aereboe et al., vol. 4, Handbuch der Landwirtschaft (P. Parey, 1929), 198). Green fodder or hay could be sufficient to provide the necessary nutrients with the exception of protein, which needed to be added in the form of concentrate (*Kraftfutter*) which the farmer needed to purchase. The handbook emphasized, however, that the viability of feeding concentrate was dependent on its price relative to the market price of dairy products and therefore often was only used in small

Figure 3.4: Livestock intensity by farm size category in pigs and cattle per ha



Source: Author's calculations based on Statistik des Deutschen Reichs vol. 412

3.3.2 The political parties and their position on protectionism

While most of the previous literature analyses the vote for one specific party, the NSDAP, I am interested in a wider range of voters, those who generally supported protectionism.Therefore a classification of parties based on their position on this issue is necessary.

The liberal parties DVP and DDP were strong supporters of free trade. The DVP ministers Stresemann and Curtius oversaw the liberal trade policy

amounts. For breeding bulls the recommended fodder consisted of "oats and good hay" (see ibid., 207) with the former as part of concentrate. Small amounts of turnips could be added to this in winter. Fatstock was considered to be even less sensitive to fodder quality than dairy cows and a diet of mostly hay is recommended. (see ibid., 211) Pasture grazing was emphasized as very important as it provides access to fodder that is rich in protein and vitamins. Especially for young animals, pasturing was seen as "indispensible" and where it was not available the feeding of green fodder was recommended (see ibid., 215).

in the second half of the 1920s and actively worked on the reintegration of Germany in the European and global economy.

The social democratic SPD and the communist KPD also favoured a reduction of tariffs. The SPD's 1925 Heidelberg manifesto demanded a "deconstruction of the protectionist tariff system through long-term trade treaties for the establishment of a free exchange of goods and the economic integration of nations."[51] The KPD was even more radical: It demanded the complete abolition of agricultural and industrial tariffs in their 1925 manifesto[52] and accused the SPD of giving in to the protectionist parties in the 1925 tariff amendment negotiations.[53]

The radical protectionist wing was represented by the DNVP and the NSDAP as well as numerous smaller parties. The push for higher tariffs within the cabinet came most strongly from the DNVP ministers, in particular the Reich Minister for Agriculture Martin Schiele. It was under his tenure – from 1930 to 1932 – that the ministry pushed through the most extreme tariff hikes. Gessner[54] describes how the protectionist Reichslandbund "sought (its) political representation" in the DNVP. While the party initially managed to unite most of the protectionist vote behind it, the formation of the Christian-National Peasants and Farmers' Party (CNBL) and the German Peasants' Party (DBP) in 1928 led to a splintering of this voting bloc.[55] The competition within the right-wing camp led to a further radicalisation of all groups in an attempt to win over the agrarian base. In the 1930 election, the Nazi party emerged as the new strong proponent of (especially agricultural) protectionism with a platform of national autarky. According to Gessner,

51. Sozialdemokratische Partei Deutschlands, *Das Heidelberger Programm : Grundsätze und Forderungen der Sozialdemokratie* (1925).

52. Kommunistische Partei Deutschlands, *Bericht über die Verhandlungen des X. Parteitages der Kommunistischen Partei Deutschlands:(Sektion der Kommunistischen Internationale): Berlin vom 12. bis 17. Juli 1925* (Vereinigung Internationaler Verlagsanstalten, 1926).

53. Becker, *Handlungsspielräume der Agrarpolitik in der Weimarer Republik zwischen 1923 und 1929*, 174.

54. Gessner, "Agrarian Protectionism in the Weimar Republic," 765.

55. Ibid., 769.

what followed was "the dissolution of the 'Green Front' and its replacement by radical anti-governmental forces such as the NSDAP, together with the collapse of the alliance between industry and agriculture"[56] that dated back to Bismarck's "marriage of iron and rye." High tariffs were a consistent theme in the Nazi platform long before its rise in the polls as it tried to appeal to its rural base by scapegoating an international liberal order.[57]

The Catholic Zentrum is a more complicated case. Its policies were principally based on the identity politics of the Catholic minority[58] and it tended to steer, true to its name, to the political centre of the Weimar political system. However, in the later years of the republic, it was the Zentrum government under Heinrich Brüning that raised tariffs substantially. I nonetheless consider the party to be neutral on trade policy for the purpose of this analysis because it was not the driving force behind these hikes and was not committed to protectionism throughout the whole period. While the Zentrum felt both economically and ideologically committed to at least *some* form of agricultural protection,[59] it never became the driving force behind radical protectionism. During the negotiations on the 1925 tariff reform, the Zentrum remained skeptical and, while open to raising tariffs, was opposed to the rent-seeking high tariff legislation envisioned by East Elbian agriculture, heavy industry, and their political representatives in the far right parties.[60] Zentrum politicians were concerned about the impact of protectionism on export industries and the cost of living in Germany.[61] The party generally took the position of the majority represented by the left-wing and liberal

56. Ibid., 773.

57. J. H. Grill, "The Nazi Party's Rural Propaganda Before 1928," *Central European History* 15, no. 2 (1982): 149–185.

58. Catholics were a minority only at the aggregated national level and constituted large majorities in some parts of the country, for instance Bavaria and the Prussian Rhine Province.

59. K. Ruppert, *Im Dienst am Staat von Weimar: das Zentrum als regierende Partei in der Weimarer Demokratie 1923-1930*, Beiträge zur Geschichte des Parlamentarismus und der politischen Parteien (Droste, 1992), 156.

60. Ibid., 155.

61. Ibid.

parties and opposed the idea of a lower bound for tariffs. While the DNVP considered the ultimately aggreed-upon autonomous tariffs to be a lower bound for future trade treaty negotiations, the Zentrum, along with the rest of the moderate political spectrum, considered them to be an upper bound, from which concessions could be made.[62] When tariffs were re-negotiated in 1927, the Zentrum supported the course of its nationalist coalition partner, the DNVP, although, as Ruppert describes, more out opportunism and out of a lack of a clear political direction and unity than out of commitment to protectionism.[63] The Zentrum was frequently the arbiter of compromise in the committee gridlock between supporters of free trade and protectionism, which often meant sacrificing the interests of its agrarian voter base.[64]

The Zentrum's Bavarian sister party on the other hand, the Bavarian People's Party BVP, can be counted more solidly in the protectionist camp as it consistently supported a high tariff policy in treaty negotiations (as described, for instance, by Becker[65]), was the strongest supporter of a protectionist agricultural policy in the 1929 tariff debates according to Barmeyer and Wallthor,[66] and actively campaigned on a high tariff platform as early as 1924. Unfortunately the election data do not distinguish precisely between BVP and Zentrum votes after 1924 and groups the two together. However, the BVP only competed in Bavaria while the Zentrum did not compete there after 1924 (it had ran its own list in the Palatinate area until 1924, but agreed to withdraw its candidates in subsequent elections).[67] I therefore consider

62. Ruppert, *Im Dienst am Staat von Weimar: das Zentrum als regierende Partei in der Weimarer Demokratie 1923-1930*, 156.

63. Ibid., 263.

64. Ibid., 415.

65. Becker, *Handlungsspielräume der Agrarpolitik in der Weimarer Republik zwischen 1923 und 1929*.

66. H. Barmeyer and H. Wallthor, *Andreas Hermes und die Organisationen der deutschen Landwirtschaft: christliche Bauernvereine, Reichslandbund, Grüne Front, Reichsnährstand 1928-1933*, Quellen und Forschungen zur Agrargeschichte (G. Fischer, 1971), 100.

67. E. Evans, *The German Center Party 1870-1933: A Study in Political Catholicism* (Southern Illinois University Press, 1981), 334.

votes in the "Zentrum+BVP" variable as part of the protectionist bloc if the district is in Bavaria and not part of it if it is outside of Bavaria.

Based on this, I include the following parties in my count of protectionist votes: The DNVP, the NSDAP[68], the BVP, as well as various splinter groups: the Christian Social People's Service, the Peasants' League, the CNBL, the Saxonian Peasants' Party and the German-Hanoverian Party. Some of the smaller parties only appear for a few elections and are subsumed in the "other" category for the other elections. I assume that their vote share in the years when they are not separately listed is so small that this does not lead to any significant bias. The whole "other" category accounted for between 0.0 and 2.9 % across all elections.

3.4 The Electoral System of the Weimar Republic

With the abolition of the monarchy and the establishment of the first republic Germany also expanded the suffrage quite significantly. Women received the right to vote and the voting age was lowered from 25 to 20. This means that the population of working age is almost identical with the population eligible to vote. The bias in the sectoral labour distribution resulting from working individuals under the age of 20 is probably small. Among those who remained excluded were individuals under tutelage or guardianship, convicted felons, and *Reichswehr* soldiers. Voting was not mandatory. Elections had to be held on a Sunday or holiday. The Reich was divided into 35 constituencies and the political parties ran tickets of ranked candidates in each of these districts. Voters did not elect individual candidates but had to choose one of these party tickets. This implies that we need to be less worried about bias due to the individual personal appeal of a direct candidate as votes reflected a

68. replaced in 1924 by two other Nazi organisations, the German Völkisch Freedom Party (DVFP) and the National Socialist Freedom Movement (NSFB) while the NSDAP was outlawed

preference for a party as a whole. Seats in the Reichstag were allocated based on proportional representation: A party ticket received one seat for every 60,000 votes in its constituency and these seats were filled in order of the candidates' ranking on the ticket. Unlike in postwar Germany there was no election threshold. Elections had to be held at least every four years but the head of state, the *Reichspräsident*, had the power to dissolve the parliament and call for new elections at any point. Due to the general instability of the Weimar political system this resulted in much more frequent Reichstag elections, eight all in all in its 14 years of existence.[69]

The president himself was elected directly and held extensive emergency powers, which were frequently put to use during the Depression years. Presidential elections were constitutionally held every seven years but *de facto* occurred in 1919, 1925 after the death of the first president Friedrich Ebert, and 1932 when Paul von Hindenburg was reelected. The head of government, the *Reichskanzler*, and his cabinet were appointed by the president.

Furthermore, the Weimar constitution left room for direct democracy as well. Two referenda were held in the 1920s but both remained unsuccessful because the quorum of 50 % was not reached.[70][71]

For a more detailed description of the intricacies of the Weimar electoral system, the reader is referred to Schanbacher.[72]

69. Seven if we dismiss the March 1933 election which, under Hitler's chancellorship, was no longer free nor fair.

70. In 1926, the left-wing parties initiated a referendum for the expropriation of the old German aristocracy. In 1929, the right-wing organisation *Stahlhelm*, supported by DNVP and NSDAP, tried to achieve the rejection of the Young Plan through another referendum.

71. D. Nohlen and P. Stöver, *Elections in Europe : a data handbook* [in eng] (Baden-Baden: Nomos, 2010).

72. E. Schanbacher, *Parlamentarische Wahlen und Wahlsystem in der Weimarer Republik : Wahlgesetzgebung und Wahlreform im Reich und in den Ländern* [in ger], Kommission für Geschichte des Parlamentarismus und der Politischen Parteien. Beiträge zur Geschichte des Parlamentarismus und der politischen Parteien (Düsseldorf: Droste, 1982).

3.5 The Importance of Trade Policy in the 1930s elections

As the Great Depression worsened in the early 1930s, trade policy became one of the central issues debated in the media before the elections. Already on election day in 1928, the liberal newspaper *Vossische Zeitung* printed a large story titled "The economy's decision: Protectionism or Tariff Reduction (...)" on the front page of its business and finance section. It continued: "The core piece of economic legislation in the coming parliament, just like in the old one, will be the redesign of the tariff. (...) The nationalist members of the cabinet are opposing a tariff reduction. (...) (Tariff hikes) have been noticed abroad. (...) It would be irresponsible if the new parliament further extended this monster (of the current, temporary tariff)."[73]

By the time of the 1930 election, the issue had become more pressing. On its front page on the eve of the election, the *Vossische* now ran two big stories on trade, both of which with bigger headlines than the hardly unimportant third story "Despotism or Democracy?"[74] One emphasised the importance of exports for employment.[75] The second was quote from a speech by British trade minister Graham demanding free trade: "Economic nationalism has failed. (...)"[76]

While the *Vossische* printed 13 articles related to trade policy on 10 different days in the month before the 1928 election, there were 20 pieces on 14 days before election day in 1930, 59 on 29 days in July 1932 and 89 on 30 days in October/November 1932. On election day in November 1932, trade policy again made the front page of the business section with an op-ed that sharply criticised the direction of German trade policy with its reliance on quotas: "Germany's economic relations to foreign countries

73. R. Lewinsohn, "Entscheidung der Wirtschaft," *Vossische Zeitung*, 1928,
74. H. Schäfer, "Despotismus oder Demokratie?," *Vossische Zeitung*, 1930,
75. "Export schafft Arbeit," *Vossische Zeitung*, 1930,
76. Ullstein-Nachrichtendienst, "Graham fordert freien Handel," *Vossische Zeitung*, 1930,

were in this year exposed to an unbearable endurance test. (...) The German government has implemented a very energetic agrarian policy. However, it has forgotten to also conduct industrial and trade policy. (...) A far-sighted German trade policy must use the opportunity [of the Ottawa agreement and Britain's turn to protectionism] to make clear to the agrarian countries that in Germany they can find a replacement for the lost English food market."[77] On the same election day, the Social Democratic *Vorwärts* lists autarky on its front page as the first argument why voters should shun the Nazis: "They promise employment to the workers, but to the farmers they promise an isolationist policy, which destroys all export and with it all remaining opportunities for employment. To the small businesspeople they promise help, but they are working with their 'autarky' plans towards the complete destruction of business life."[78]

Trade policy remained a central topic into the last days of the republic: As Günther Mai writes,

> [w]hen, in mid-January 1933 the state crisis of the Weimar Republic reached its climax, the *Reich* cabinet was debating cabbage, tomatoes, and cheese. The discussion was about the question whether trade treaties with the Netherlands and Sweden should be extended or not. [...] In the face of the question if Adolf Hitler could be prevented as *Reich* chancellor, this may seem a marginal problem at first sight. But it was a fundamental decision [...] for the fate of the republic.[79]

77. W. Düsterwald, "Die Pflicht des Staates: Konsequente Handelspolitik," *Vossische Zeitung*, 1932,

78. "Warum wieder wählen?," *Vorwärts*, 1932,

79. G. Mai, *Die Weimarer Republik*, Beck'sche Reihe (Beck, 2009), 6-7.

3.6 Data

3.6.1 Elections

I use election data for the Weimar Republic parliamentary elections provided by Falter and Hänisch.[80][81] The data set covers all elections between 1920 and 1933 including Reichstag elections, presidential elections, and referenda. I restrict the data to parliamentary votes and drop the 1920 election because it is long before trade policy became an important issue, and because a large number of district border changes between 1920 and 1924 would force me to reduce the sample size by a lot in order to harmonize the data set over time. This leaves me with seven votes: May 1924, December 1924, 1928, 1930, July 1932, November 1932, and 1933. The last election in March 1933 after the ascension of Hitler to the chancellorship is generally not considered to have been free and fair anymore, but was the last one in which parties other than the NSDAP participated (they were subsequently outlawed). For each election, the turnout and votes for each major party are provided. The Falter data set also contains numbers of Catholics, Protestants, and Jews in 1925, as well as unemployment numbers and various occupational statistics. Aggregation is provided at the level of the 35 electoral districts (Wahlkreise), of 78 states (*Länder*) and, for larger states, administrative regions (*Regierungsbezirke*), and of a varying number of about a thousand districts called *Kreise* in Prussia and various other terms for "smaller administrative districts" in the other states,[82] at the time of each respective election.[83] For this analysis I only make

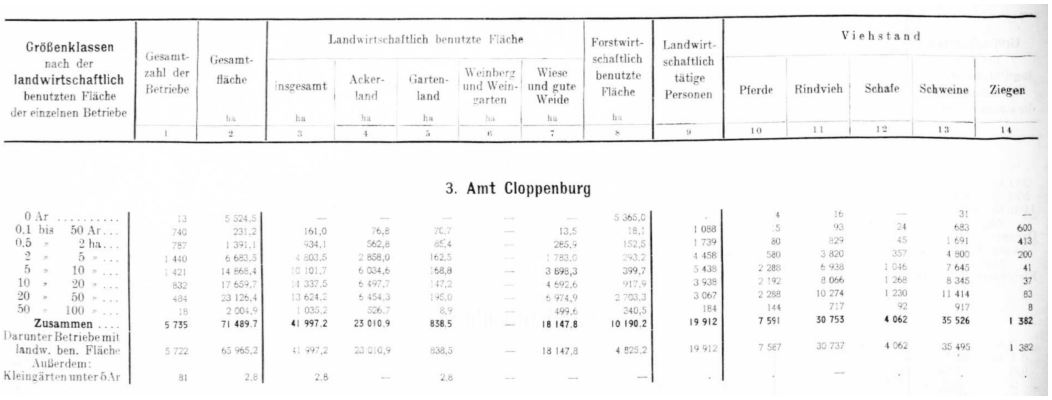
80. D. Hänisch, "Inhalt und Struktur der Datenbank "Wahl- und Sozialdaten der Kreise und Gemeinden des Deutschen Reiches von 1920 bis 1933"," *Historical Social Research / Historische Sozialforschung* 14, no. 1 (49) (1989): 39–67.

81. This version of the Weimar voting data is superior to an older data set available through the Inter-university Consortium for Political and Social Research (*German Weimar Republic Data, 1919-1933*). The latter has many flaws and errors, as Falter and Gruner ("Minor and major flaws of a widely used data set: The ICPSR German Weimar Republik Data 1919-1933 under scrutiny") have shown.

82. I refer to all of these smaller units as districts hereafter.

83. In many cases, larger municipalities are provided separately too.

Figure 3.5: An example of the agricultural statistics



Größenklassen nach der landwirtschaftlich benutzten Fläche der einzelnen Betriebe	Gesamtzahl der Betriebe	Gesamtfläche ha	Landwirtschaftlich benutzte Fläche: insgesamt ha	Ackerland ha	Gartenland ha	Weinberg und Weingarten ha	Wiese und gute Weide ha	Forstwirtschaftlich benutzte Fläche ha	Landwirtschaftlich tätige Personen	Viehstand: Pferde	Rindvieh	Schafe	Schweine	Ziegen
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
3. Amt Cloppenburg														
0 Ar	13	5 524,5	—	—	—	—	—	5 365,0	-	4	16	—	31	—
0,1 bis 50 Ar	740	231,2	161,0	76,8	76,7	—	13,5	18,1	1 088	5	93	24	683	600
0,5 » 2 ha	787	1 391,1	934,1	562,8	85,4	—	285,9	152,8	1 739	80	829	45	1 691	413
2 » 5 »	1 440	6 683,5	4 803,5	2 858,9	162,5	—	1 783,0	293,2	4 458	580	3 820	357	4 800	200
5 » 10 »	1 421	14 868,4	10 101,7	6 034,6	168,8	—	3 898,3	399,7	5 438	2 288	6 938	1 046	7 645	41
10 » 20 »	832	17 659,7	14 337,5	6 497,7	147,2	—	4 692,6	917,9	3 938	2 192	8 066	1 268	8 345	37
20 » 50 »	484	23 126,4	13 624,2	6 454,3	195,0	—	6 974,9	2 703,3	3 067	2 288	10 274	1 200	11 414	83
50 » 100 »	18	2 004,9	1 035,2	526,7	8,9	—	499,6	240,5	184	144	717	92	917	8
Zusammen	**5 735**	**71 489.7**	**41 997.2**	**23 010.9**	**838.5**	—	**18 147.8**	**10 190.2**	**19 912**	**7 551**	**30 753**	**4 062**	**35 526**	**1 382**
Darunter Betriebe mit landw. ben. Fläche	5 722	65 965,2	41 997,2	23 010,9	838,5	—	18 147,8	4 825,2	19 912	7 587	30 737	4 062	35 495	1 382
Außerdem: Kleingärten unter 5 Ar	81	2,8	2,8	—	2,8	—	—	—	-	-	—	-	-	-

The numbered columns show for the district of Cloppenburg: (1) number of farms; (2) total area of farms; (3) total area of farms used for agriculture, out of which (4) used for tillage, (5) gardens, (6) vineyards, (7) pasture; (8) land used for forestry: (9) people working in agriculture; number of (10) horses, (11) cattle, (12) sheep, (13) pigs, and (14) goats. The data are disaggregated into eight categories by farm size. The bold line reports the total. Source: Statistik des Deutschen Reichs vol. 412

use of the lowest aggregation, the district level data. Districts appear and disappear in the data from one election to another if they were dissolved or merged with others. Even where a district is continuously included in all elections, that does not ensure consistency as district borders often changed and municipalities moved from one district to another. As long as the name remains the same, a district will be included as one observation, whereas if the name changes a new observation is used for the later elections. The raw data includes 1246 observations at the district level, but only 925 have no gaps throughout all elections between 1924 and 1933.

3.6.2 Agricultural Structure

I use data on the structure of agriculture collected by the *Statistisches Reichsamt* in the 1925 census.[84] This volume lists, at various levels of disaggregation, detailed statistics about land usage, employment and livestock farming.

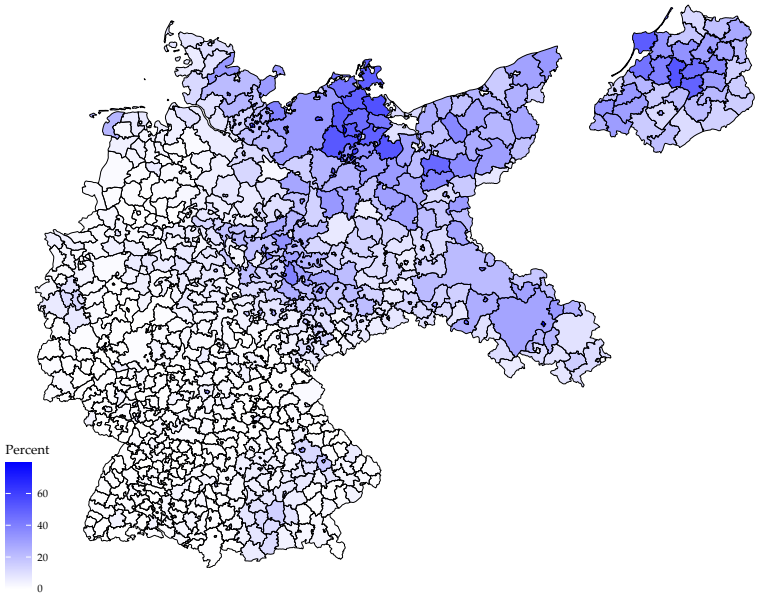
84. Statistisches Reichsamt, *Statistik des Deutschen Reichs 412: Landwirtschaftliche Betriebszählung*.

Figure 3.5 shows an example of this. The data are reported in this format for 1052 districts according to their 1925 boundaries. For the purpose of this research I have transcribed the data from the whole third and ninth columns in the picture (total area used for agriculture (excluding forestry) and number of individuals working in agriculture) for each farm size category which enables me to construct variables for the share of agricultural workers employed in large (for instance, over 50 hectares) or small (for instance, less than 5 hectares) farms as well as the degree of ownership concentration or dispersion of land. I have further transcribed the totals for columns (1) (number of farms), (2) (total area), and (3) (total agriculturally used area) in order to be able to calculate the average farm size. Finally, I have transcribed the totals of columns (11) (number of cattle) and (12) (number of pigs) to construct a measure of livestock intensity via the number of animals per hectare of farmland and also to distinguish between the two major types of livestock which show important differences in their geographical distribution. Figures 3.6, 3.7, and 3.8 illustrate why this is potentially important. [85] They show heat maps of the share of workers employed in large farms, the number of cattle per hectare, and number of pigs per area, respectively. While there is a clear negative correlation between the large farm share and livestock intensity, with large farms predominantly in the territories east of the river Elbe and livestock farming mostly in the Northwest and South, there is also a difference between cattle farming which is more widespread in Bavaria and pig farming which is mostly found in the Northwest.

Figure 3.9 additionally shows the share of residents relying on agriculture and forestry (including workers, farm owners and family dependents) as a percentage of the total residential population. It illustrates that the sector

85. All cartographic illustrations of the data used here are based on the shape files for the German Empire constructed by the Max Planck Institute for Demographic Research.Max Planck Institute for Demographic Research, "Population History GIS Collection," 2011, accessed May 20, 2021, `https://censusmosaic.demog.berkeley.edu/data/historical-gis-files` I start with the shape file for 1925 and subsequently adjust it for later boundary changes as laid out in the district aggregation section below.

Figure 3.6: The share of agricultural workers who are employed in large farms (over 50 hectares)



Shapefile source: MPDIR (2011), Data source: Statistik des Deutschen Reichs vol. 412

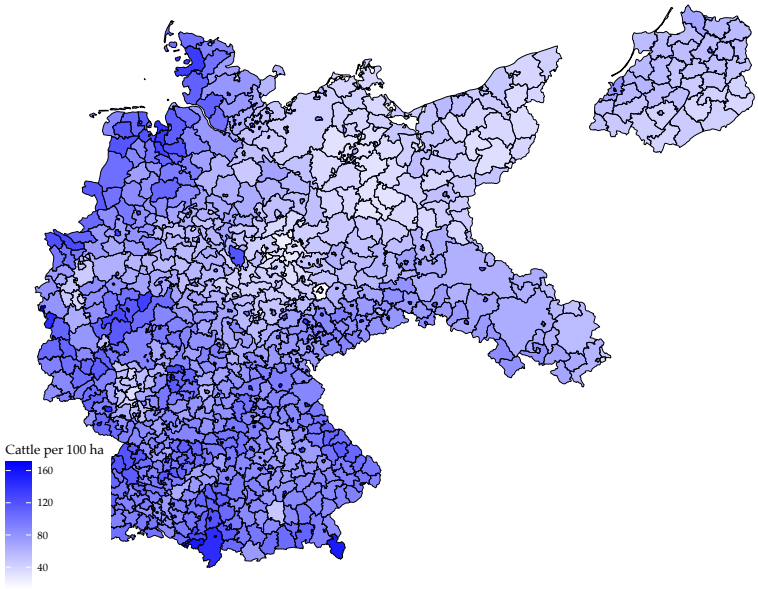
was primarily concentrated in Lower Saxony, in the East Elbian parts of Prussia, and in Bavaria.

3.6.3 Industrial Structure

I use statistics on the employment structure of each district based on the 1925 census.[86] Figure 3.10 shows an example of the original documents. The volumes list various indicators of economic activity at four levels of disaggregation by sector: divided into six *Gewerbeabteilungen* (agriculture, forestry, and fishing; industry and crafts; trade and transport; public sector and professional occupations; healthcare; domestic servives), and

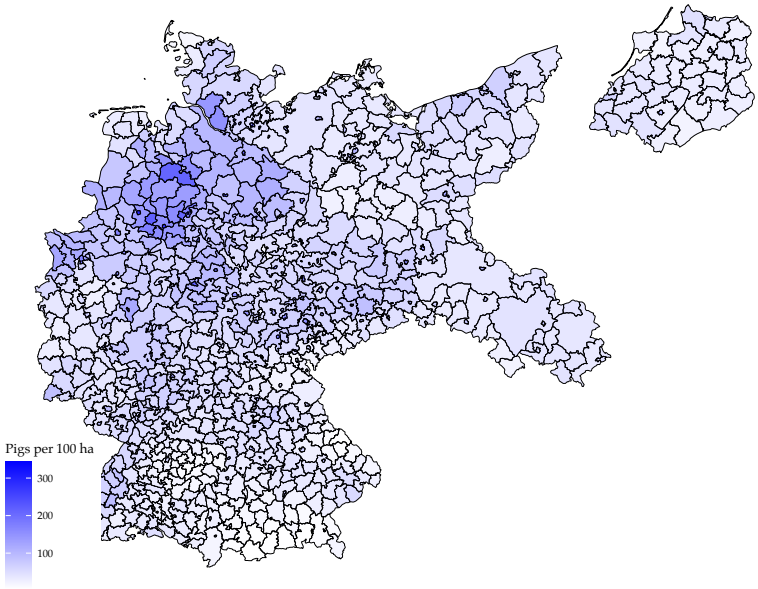
86. Statistisches Reichsamt, *Statistik des Deutschen Reichs 403: Berufszählung Ost- und Mitteldeutschland*; Statistisches Reichsamt, *Statistik des Deutschen Reichs 404: Berufszählung Nord- und Westdeutschland*; Statistisches Reichsamt, *Statistik des Deutschen Reichs 405: Berufszählung Süddeutschland und Hessen*.

Figure 3.7: The number of cattle per 100 ha agricultural land



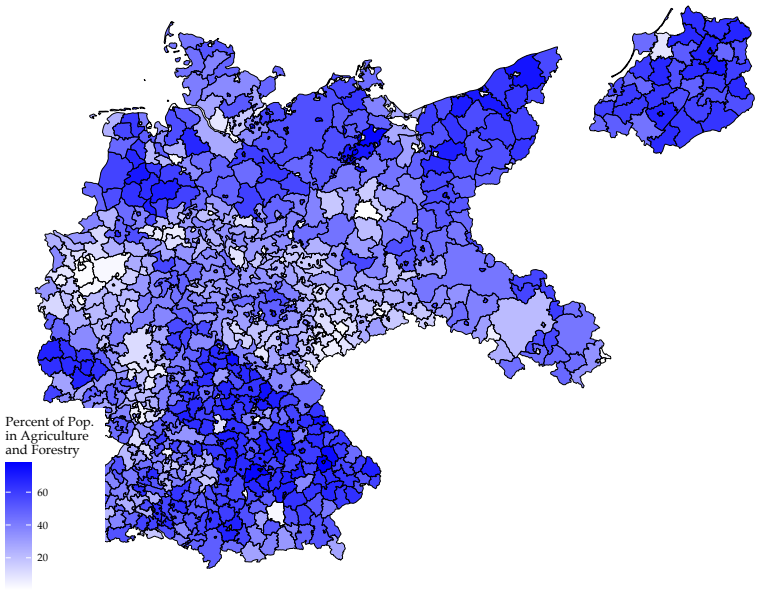
Shapefile source: MPDIR (2011), Data source: Statistik des Deutschen Reichs vol. 412

Figure 3.8: The number of pigs per 100 ha agricultural land



Shapefile source: MPDIR (2011), Data source: Statistik des Deutschen Reichs vol. 412

Figure 3.9: The percentage of residents employed in or dependent on agriculture and forestry



Shapefile source: MPDIR (2011), Data source: Hänisch (1989)

Table 3.1: Summary statistics of the agricultural sector variables (after aggregation)

Variable	Mean	Std. Dev.	Min.	Max.	N
Personnel on farms 0.1-50 ar	2118.09	2258.284	12	29092	1052
Personnel on farms 0.5-2 ha	2269.685	2327.439	0	17839	1052
Personnel on farms 2-5 ha	2618.703	2408.733	0	16601	1052
Personnel on farms 5-10 ha	2232.337	1819.69	0	10725	1052
Personnel on farms 10-20 ha	1782.94	1570.251	0	9506	1052
Personnel on farms 20-50 ha	1235.856	1418.319	0	8721	1052
Personnel on farms 50-100 ha	354.015	518.809	0	2987	1052
Personnel on farms 100-200 ha	271.86	436.489	0	2850	1052
Personnel on farms 500-1000 ha	231.461	696.08	0	5837	1048
Personnel on farms > 1000 ha	38.772	155.835	0	1411	1052
Number of farms	4922.373	4132.016	10	70093	1052
Total land area in agriculture (incl. forestry) in ha	34928.11	32266.521	0.700	199773.1	1052
Total land area in agriculture (excl. forestry) in ha	24333.45	22235.29	0.6	129247.4	1052
Average farm size in ha	4.694	3.125	0.06	16.981	1052
Number of cattle	16503.956	13235.839	0	77420	1052
Number of pigs	12336.349	12880.821	3	93592	1052
Total land area vinyards in ha	62.797	309.295	0	4339	1052

The 1052 observations in this table are the small administrative districts (*Kreise*, including their bigger municipalities) in the 1925 census.

23 *Gewerbegruppen*.[87] I use the second category of disaggregation for most of the analysis which is fine-grained enough to allow for a distinction between industries in which Germany has an export surplus and those where it has a deficit, whilst being sufficiently aggregated to draw meaningful conclusions. In the case of agriculture, I distinguish between those classified as 'workers' and all others, who are mostly farm owners and family members. I also include the numbers of unemployed at the time of the census though we need to keep in mind that this number does not accurately reflect unemployment at the time of the later censuses during the height of the Great Depression. The resulting 28 sectors are listed in table 3.2 for reference. It also reports summary statistics for the relative share of each sector.

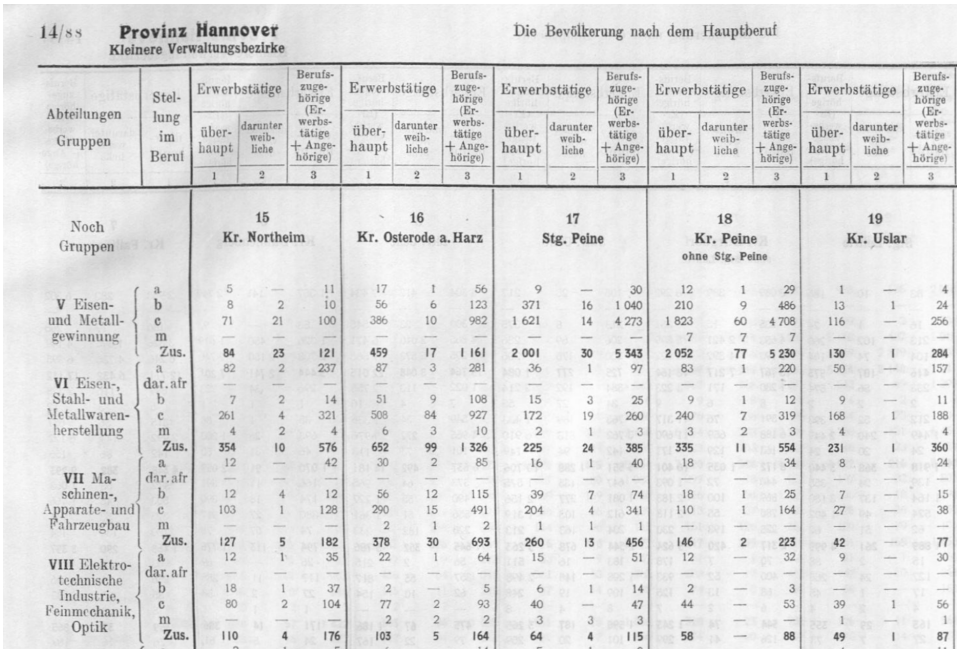
The volumes list larger municipalities separately from their districts for a total of 1415 observations. Once the municipalities have been merged with the districts they were in, 1052 observations remain, just like in the agricultural raw data. Except for the separate reporting of municipalities the aggregation levels are identical with those of the agricultural data making it easy to merge the two.

3.6.4 The Data Aggregation Process

The diverging numbers of observations in all three data sets – the agricultural census, the electoral data, and the industrial employment census – present a problem: While all data are recorded at the district level, there are inconsistencies in the district borders. For electoral purposes, for instance, Berlin is divided into 25 units of observation while the agricultural data treats it as one unit. Every state handles the definition of a district differently

87. A further disaggregation is available from the business census of the same year where employment is disaggregated into 162 *Gewerbeklassen*, or 619 *Gewerbearten*. However, the numbers at the higher aggregation levels do not match the ones from the employment census, presumably due to inter-district employment where individuals work in one district and live (and therefore vote) in another. One example for this would be the common case of a city being a district of its own while the surrounding countryside constitutes another district. I therefore use the residence-based census wherever possible.

Figure 3.10: An example of the industrial statistics



14/88 **Provinz Hannover**
Kleinere Verwaltungsbezirke

Die Bevölkerung nach dem Hauptberuf

Abteilungen Gruppen	Stellung im Beruf	15 Kr. Northeim			16 Kr. Osterode a. Harz			17 Stg. Peine			18 Kr. Peine ohne Stg. Peine			19 Kr. Uslar		
		Erwerbstätige überhaupt	Erwerbstätige darunter weibliche	Berufszugehörige (Erwerbstätige + Angehörige)	Erwerbstätige überhaupt	Erwerbstätige darunter weibliche	Berufszugehörige (Erwerbstätige + Angehörige)	Erwerbstätige überhaupt	Erwerbstätige darunter weibliche	Berufszugehörige (Erwerbstätige + Angehörige)	Erwerbstätige überhaupt	Erwerbstätige darunter weibliche	Berufszugehörige (Erwerbstätige + Angehörige)	Erwerbstätige überhaupt	Erwerbstätige darunter weibliche	Berufszugehörige (Erwerbstätige + Angehörige)
		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Noch Gruppen																
V Eisen- und Metallgewinnung	a	5	—	11	17	1	56	9	—	30	12	1	29	1	—	4
	b	8	2	10	56	6	123	371	16	1 040	210	9	486	13	1	24
	c	71	21	100	386	10	982	1 621	14	4 273	1 823	60	4 708	116	—	256
	m	—	—	—	—	—	—	—	—	—	7	7	7	—	—	—
	Zus.	84	23	121	459	17	1 161	2 001	30	5 343	2 052	77	5 230	130	1	284
VI Eisen-, Stahl- und Metallwarenherstellung	a	82	2	237	87	3	281	36	1	97	83	1	220	50	—	157
	dar. afr	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	b	7	2	14	51	9	108	15	3	25	9	1	12	9	—	11
	c	261	4	321	508	84	927	172	19	260	240	7	319	168	1	188
	m	4	2	4	6	3	10	2	1	3	3	2	3	4	—	4
	Zus.	354	10	576	652	99	1 326	225	24	385	335	11	554	231	1	360
VII Maschinen-, Apparate- und Fahrzeugbau	a	12	—	42	30	2	85	16	1	40	18	—	34	8	—	24
	dar. afr	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	b	12	4	12	56	12	115	39	7	74	18	1	25	7	—	15
	c	103	1	128	290	15	491	204	4	341	110	1	164	27	—	38
	m	—	—	—	2	1	2	1	1	1	—	—	—	—	—	—
	Zus.	127	5	182	378	30	693	260	13	456	146	2	223	42	—	77
VIII Elektrotechnische Industrie, Feinmechanik, Optik	a	12	1	35	22	1	64	15	—	51	12	—	32	9	—	30
	dar. afr	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	b	18	1	37	2	—	5	6	1	14	2	—	3	—	—	—
	c	80	2	104	77	2	93	40	—	47	44	—	53	39	1	56
	m	—	—	—	2	2	2	3	3	3	—	—	—	1	—	1
	Zus.	110	4	176	103	5	164	64	4	115	58	—	88	49	1	87

The columns show (1) the total labour force in each sector, (2) the number of women employed and (3) the labour force plus all dependents. The rows show (a) self-employed, (b) managerial and administrative employees, (c) manual and clerical workers, (m) supporting family members, and (Zus) the total. Source: Statistik des Deutschen Reichs vol. 404

and that is reflected in the aggregation levels for some smaller states such as Lippe. Some data sets contain territories that were subsequently ceded to Poland and are not accounted for in the elections. District borders also change over time or districts disappear completely. In order to be able to merge these data sets and analyse them with consistent observations over time, these border changes need to be corrected for.

I begin by hand-matching the districts by name across the three data sets. I then identify every district that cannot be matched and correct for name changes based on a catalogue of historical district changes in Germany, the *Grundriß zur deutschen Verwaltungsgeschichte 1815-1945*.[88] I merge all districts within Berlin from the election data to one observation to make them compatible with the other sources. I then identify any districts for which

88. W. Hubatsch et al., *Grundriß zur deutschen Verwaltungsgeschichte 1815-1945* (Johann-Gottfried-Herder-Institut, 1975).

Table 3.2: Summary statistics of the economic sector labour share variables (after aggregation)

Variable	Mean	Std. Dev.	Min.	Max.	N
01 Gardening and animal husbandry %	0.365	0.235	0.002	0.810	1052
02 Fishing %	0.006	0.008	0	0.077	1052
03 Mining %	0.020	0.066	0	0.585	1052
04 Nonmetallic minerals %	0.023	0.038	0.001	0.592	1052
05 Iron and metal production %	0.012	0.03	0	0.352	1052
06 Metalwares %	0.025	0.041	0.005	0.416	1052
07 Machinery and vehicles %	0.025	0.034	0	0.372	1052
08 Elecronics, precision mechanics, optics %	0.008	0.02	0	0.362	1052
09 Chemicals %	0.007	0.019	0	0.268	1052
10 Textiles %	0.031	0.070	0	0.532	1052
11 Paper %	0.010	0.014	0	0.116	1052
12 Leather %	0.005	0.010	0	0.158	1052
13 Rubber and asbestos %	0.001	0.005	0	0.119	1052
14 Woodworking %	0.029	0.022	0.004	0.255	1052
15 Musical instruments and toys %	0.003	0.018	0	0.400	1052
16 Food and beverages %	0.034	0.025	0.004	0.347	1052
17 Clothing %	0.036	0.032	0.007	0.593	1052
18 Construction %	0.047	0.017	0.008	0.133	1052
19 Water, gas and electricity supply %	0.004	0.004	0	0.032	1052
20 Trade %	0.057	0.040	0.003	0.246	1052
21 Insurance %	0.002	0.002	0	0.028	1052
22 Transportation %	0.034	0.027	0.003	0.207	1052
23 Hospitality %	0.017	0.018	0.002	0.300	1052
24 Civil service, military, churches %	0.036	0.034	0.009	0.517	1052
25 Healthcare %	0.014	0.009	0.001	0.113	1052
26 Domestic services, casual employment %	0.041	0.021	0.007	0.167	1052

The 1052 observations in this table are the small administrative districts (*Kreise*, including their bigger municipalities) in the 1925 census.

periods within the election data series are missing, look up these districts' names in the *Grundriß* and merge them with their predecessor or successor districts. For instance, the districts of Dessau and Kothen disappear from the data after the election of 1930. Instead, a new district of Dessau-Kothen appears, which has been created from the two older districts. I therefore add up the values for all absolute variables to create one district Dessau-Kothen throughout the whole period. I do this for all cases where a district is created out of several complete districts or is split up into several new districts. However, there are numerous cases where the aggregation is less clean. Very often single municipalities were shifted from one district into another or

districts were dissolved and their municipalities allocated to various already existing neighbour districts. To account for these changes, I use the same method as King et al.[89] and keep the population of each district as consistent as possible. I use the population data recorded in the Falter election data set which is available for each election date at the district level. The population was not counted every time an election was held; instead, the population numbers for all elections before 1925 are based on the 1919 census. Those after 1925 are based on the 1925 census (the next census was only held in 1933). This means that any changes in population numbers between elections must be due to redrawn borders and not real demographic shifts, with the exception of the 1924-1928 interval. To keep districts consistent over time, I apply the same method as King et al.[90] and identify all observations for which a population shift of more than 10 % occurs between two consecutive elections. For the 1924-1928 window I allow for population changes up to 20 %. Based on Hubatsch et al.,[91] I then identify the districts between which municipalities were moved and merge these districts until I have a consistent unit for which the population changes are below 10 %.[92]

The final result is a data set that contains 821 district level observations, which is the number I work with in the subsequent analysis. Figure 3.11 shows a comparison of the unedited district boundaries in 1925 on the left and the aggregated version on the right.[93]

89. King et al., "Ordinary economic voting behavior in the extraordinary election of Adolf Hitler."

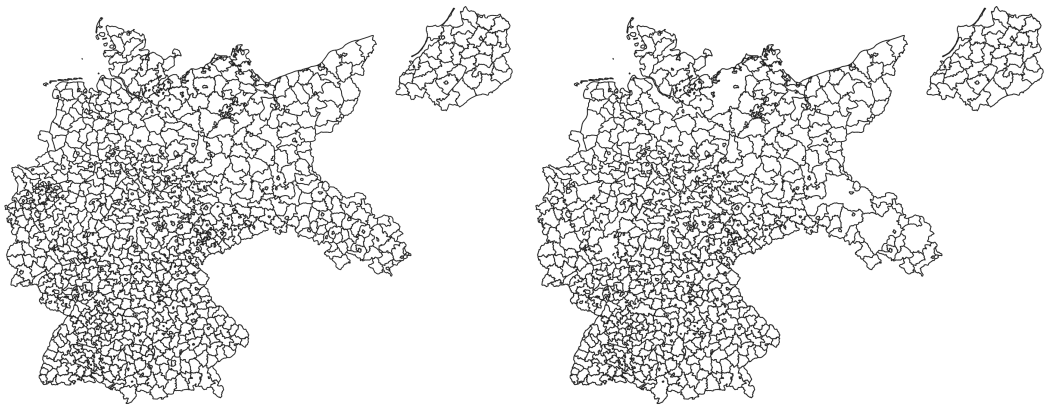
90. Ibid.

91. Hubatsch et al., *Grundriß zur deutschen Verwaltungsgeschichte 1815-1945*.

92. Only 11 districts have population changes larger than 15 % (and none more than 20 %) that are unexplained by district redrawing. In all of these cases, the change occurs in the aforementioned window between 1924 and 1928 and is therefore explained by the change in the census of reference. Population changes are close to zero for all other intervals.

93. The original shapefile for this map and all further maps in this chapter were published by the Max Planck Institute for Demographic Research ("Population History GIS Collection"). They are based on the work of Hubatsch et al. (*Grundriß zur deutschen Verwaltungsgeschichte 1815-1945*) and can be downloaded from `https://censusmosaic.demog.berkeley.edu/data/historical-gis-files`.

Figure 3.11: Map of unedited district borders in 1925 (left) and aggregated districts for analysis (right)



Shapefile source: MPDIR 2011

3.6.5 Possible Age Bias

The individuals listed in the 1925 occupational census are not identical with the population that is eligible to vote. The occupational census includes people as young as 14 while the voting age in the Weimar Republic was 20. To ensure that this does not lead to a bias, I compare the occupational structure at the nationwide level in table 3.3. A disaggregation by age is available at higher geographical aggregation levels from the *Statistik des Deutschen Reichs*, volume 401. The table shows that the share of under-20s in a sector's labour force varies a lot: It ranges from 5.47 % in public sector and professional occupations to 31.7 % in domestic services. I therefore adjust the number of workers for each sector in each district by multiplying the district-level sector variables by the nationwide share of individuals 20 years and older in the respective sector. For instance, if there are 2,000 people reported as working in agriculture in any given district, I would adjust this number by multiplying it by 0.852, the share of over-20-year-olds in agriculture at the national level. This would result in an estimated 1704 agricultural workers in that district.[94]

94. I run the algorithm without this adjustment as a robustness check, which does not fundamentally change the results.

Table 3.3: Share of working individuals aged 19 and younger by sector

Sector	Name	Under 20	% of sector
1	Agriculture	2,016,587	14.80
2	Fishing	13,876	7.02
3	Mining	89,516	10.51
4	Minerals	122,117	17.39
5	Iron and Metal	83,688	14.40
6	Metalwares	308,591	30.18
7	Machinery and vehicles	284,231	21.52
8	Electronics, Precision Mechanics, Optics	124,918	21.72
9	Chemicals	43,632	12.34
10	Textiles	243,756	19.94
11	Paper	113,172	20.94
12	Leather	40,530	22.76
13	Rubber and asbestos	11,156	16.17
14	Timber and woodworking	266,327	26.18
15	Musical instruments and toys	23,075	20.50
16	Food and beverages	277,444	19.36
17	Clothes	416,192	25.33
18	Construction	288,122	16.30
19	Utilities	12,399	6.87
20	Trade	551,082	17.05
21	Insurance	15,590	12.44
22	Transport	54,277	3.50
23	Hospitality	85,534	10.42
D	Administration, military, etc.	87483	5.47
E	Healthcare	66,067	10.73
F	Domestic service	528,243	31.66
G	Unemployed	319,143	8.30
	Total	6,486,748	15.88

3.7 The Problem of Ecological Inference

Ecological inference is necessary wherever research requires the analysis of individual behaviour based on aggregate data. In this case, we are interested in the voting behaviour of, for instance, farmers with regards to protectionist parties. We know how many people in each district voted for protectionist and how many for liberal parties. We also know how many people in each sector work in agriculture. This, however, does not allow us to draw direct

conclusions about how many farmers voted for protectionism. Table 3.4 illustrates the problem with the notation used by King[95] as adjusted by Lehmann.[96] I have data at the district level for each constituency i along two dimensions: electoral votes for each party and a demographic characteristic j, in this case sector of employment. We know V_i and T_i from the election data and X^j from the occupational census data but we are interested in λ_i^j and β_i^j. We could draw conclusions based on the correlation between the share of farmers and the share of protectionist votes or run a regression of the latter on the former (known as Goodman's regression), but this exposes us to a lot of potential bias. If we have a district where 20 % work in agriculture and 20 % voted for protection, we still do not know who voted for what. The vote could be split along occupational lines but it could also be that 20 % of each group voted for protection, or even that 0 % of farmers and 25 % of the others did.

Table 3.4: The Problem of Ecological Inference

	Procection	Free Trade	Turnout	No Vote	Total
Share of voters in sector j	λ_i^j	$1-\lambda_i^j$	β_i^j	$1-\beta_i^j$	X^j
Share of other voters	λ_i^{-j}	$1-\lambda_i^{-j}$	β_i^{-j}	$1-\beta_i^{-j}$	$1-X^j$
Total	V_i	$1-V_i$	T_i	$1-T_i$	

King's ecological inference algorithm provides a solution for this problem. It narrows down the bounds for each district's βs and λs and then applies a maximum likelihood estimation assuming that all districts are drawn from the same distribution. The result are district-specific point estimates with much higher precision and less vulnerability to bias than other methods provide. I use the *ei* package for the *R* programming language developed by King for this, which takes a matrix of values for T_i, X_i, and V_i, a vector of control variables as well as district populations (denoted as N_i) and returns

95. King, *A solution to the ecological inference problem: Reconstructing individual behavior from aggregate data*.

96. Lehmann, "The German elections in the 1870s: why Germany turned from liberalism to protectionism."

point estimates and standard errors for the variables of interest along with various graphical representations.[97]

The algorithm first restricts the bounds in which the betas can fall via a simple accounting identity. If we divide the population of a district into two groups, one working in sector j (for instance agriculture) and one working elsewhere, then the overall turnout T_i in district i is just the turnout in sector j multiplied by the number of people employed in j (that is X_i) plus the turnout in the other sectors multiplied by the people employed in these sectors (that is $1 - X_i$):

$$T_i = \beta_i^j X_i + \beta_i^{-j}(1 - X_i) \tag{3.1}$$

which we can rearrange to

$$\beta_i^j = \frac{T_i}{X_i} - \beta_i^{-j}\frac{1 - X_i}{X_i} \tag{3.2}$$

This is an equation with two unknowns, β_i^j and β_i^{-j} which allow us to plot the possible values for the two variables as a linear relationship. Since we have information on the known parameters T_i and X_i for hundreds of districts, we can draw such a line for each one of them. All possible values for the betas of a given district must fall on this line which gives us a lower and upper bound for each district. To explain this further, we can look at an example in the simplified 2x2 space: let us assume there are only two sectors, agriculture and industry, in which the entire adult population is employed, and two voting outcomes, party A and party B. If 90 % of the population in a district is employed in agriculture and 90 % of the population voted for party A, then it is mathematically impossible for the agricultural population to mostly have voted for party B. The vote share of party A is $0.9 = 0.9X^{agr} + 0.1X^{ind}$ where X^{agr} is the vote for party A among

97. For the software package and more information on it see `https://gking.harvard.edu/eir`.

agricultural workers and X^{ind} that among industrial voters. We can solve this to $X^{agr} = 1 - \frac{1}{9}X^{ind}$, which means that since X^{ind} has to be between 0 and 1, the range of possible outcomes for X^{agr} is between $\frac{8}{9}$ and 1.[98]

While this first step reduces the uncertainty for each district by setting a range of possible outcomes, it can still leave us with a relatively large interval, especially for districts with a low share of workers in the sector of interest. King's algorithm therefore proceeds based on the assumptions that the sectoral vote shares for each district are drawn randomly from the same truncated bivariate normal distribution and that the βs are "mean independent" of X_i.[99] Since we have more than 800 linear accounting identities of the type described above for each sector (one for each district), we can determine the mode of this normal distribution and use it to estimate each districts vote shares. The algorithm executes a maximum likelihood estimation to estimate intermediate parameters of the model and then uses these parameters in a repeated simulation of the quantities of interest. In order to determine the value of each district's beta, the model "*borrows strength* from data in other precincts".[100] To illustrate the method in more detail, I provide an example of the procedure for the 1930 agricultural vote in the appendix.

The algorithm also allows for the inclusion of control variables to avoid what King calls aggregation bias, which occurs when aggregated data veil individual behaviour and lead to spurious correlations.[101] Finally, since the algorithm not only gives us an estimate at the aggregate level for the whole

98. Conversely, the bounded range for the industrial vote for party A, $X^{ind} = 9 - 9x$ does not reduce the range at all. The possible values fall between 0 and 9, the latter of which is outside the range of possible values.

99. King, *A solution to the ecological inference problem: Reconstructing individual behavior from aggregate data*, 94.

100. Ibid.

101. Lehmann ("The German elections in the 1870s: why Germany turned from liberalism to protectionism," 161) gives a good example of this: Suppose farmers systematically have a lower voter turnout than non-farmers, but at the same time, for some unobserved reason, the turnout at the district level is positively correlated with the share of farmers in the population. In this case, the algorithm would predict a higher turnout of farmers than of non-farmers despite the opposite being true.

Reich, but separate estimates for each district, we can then treat these estimates as variables of their own and run second-stage regressions in order to analyse, for instance, which structural variables are correlated with a high agricultural turnout. This allows us to distinguish between areas with high livestock rates or with very large farms and examine their distinct voting behaviour.

3.8 Results

3.8.1 Estimation of agricultural turnout and protectionist vote share

I begin with a look at turnout rates in agriculture. I calculate the ratio of the number of people working in agriculture over the total labour force and run the ecological inference algorithm with voter turnout as the explained and the agricultural share as the explanatory variable for each of the seven Reichstag elections. I do this separately for workers and farm owners. The results are plotted in figure 3.12. The unbroken lines shows the true mean turnout across all voters and the estimated mean turnout of agricultural voters (separated by workers and farm owners), the average βs, with confidence intervals of 2 standard errors represented by the dashed lines. The graph shows that in fact agricultural turnout was lower than average throughout almost the whole period and follows approximately the same pattern as the overall vote. It is marginally higher among farm owners in the December 1924 election and close to equal in 1933. The turnout among agricultural workers is even lower than that among owners in the whole period, with a particularly pronounced difference in the 1928 election.

I then run the second stage of the algorithm with the total vote for protectionist parties as the explained variable conditional on turnout. Graph 3.13 shows the resulting estimates, the λs. Both the true mean of the whole population and the estimated agricultural vote show a steady upward trend

beginning after the onset of the agricultural crisis. The overall vote for protectionist parties (the DNVP, the NSDAP, the BVP and various smaller parties) rises from 31 % in May 1924 to 56 % in the last multi-party election in March 1933, reflecting the general right-wing shift in the political landscape and the decline of the liberal forces in German politics. During the period of liberal trade policy in the 1920s, the agricultural voters were significantly more inclined to vote for protectionist parties. The difference between the population mean and the agricultural peaks in 1928 when it is as high as 12 percentage points for owners. This difference, however, shrinks after the paradigm shift in trade policy. The gap narrows to 7 points in 1930 before it widens again in the 1932 elections. Agricultural workers were a lot more supportive of protectionist parties than the farm owners in the whole period. Agriculture was more protectionist throughout the period but it does not seem as if the sector voted homogeneously. We therefore need to look more closely at the voting behaviour of districts with varying agricultural structure.

Since these estimates are means of the district level estimates, we can easily compare various subgroups. Table 3.5 shows the means of the lambda coefficients separately first for all districts in which the share of farms smaller than 5 hectares as a fraction of total farm lands is above the median, then for all in which it is below. I also again list the protectionist vote in the overall population for comparison.

The estimates show that in all elections, farm owners in districts with predominantly smaller farms and therefore livestock farming were less likely to vote for protectionist parties than those in districts with larger farms. This pattern holds in all seven of the Reichstag elections between 1924 and 1933. In May 1924, protectionist parties won 37 % of the vote of farm owners in districts with a high share of peasant farms, but 46 % in those with larger farms. This discrepancy increases in subsequent elections, then decreases again but is consistently between 9 and 12 percentage points.

Figure 3.12: Agricultural voter turnout in Reichstag elections

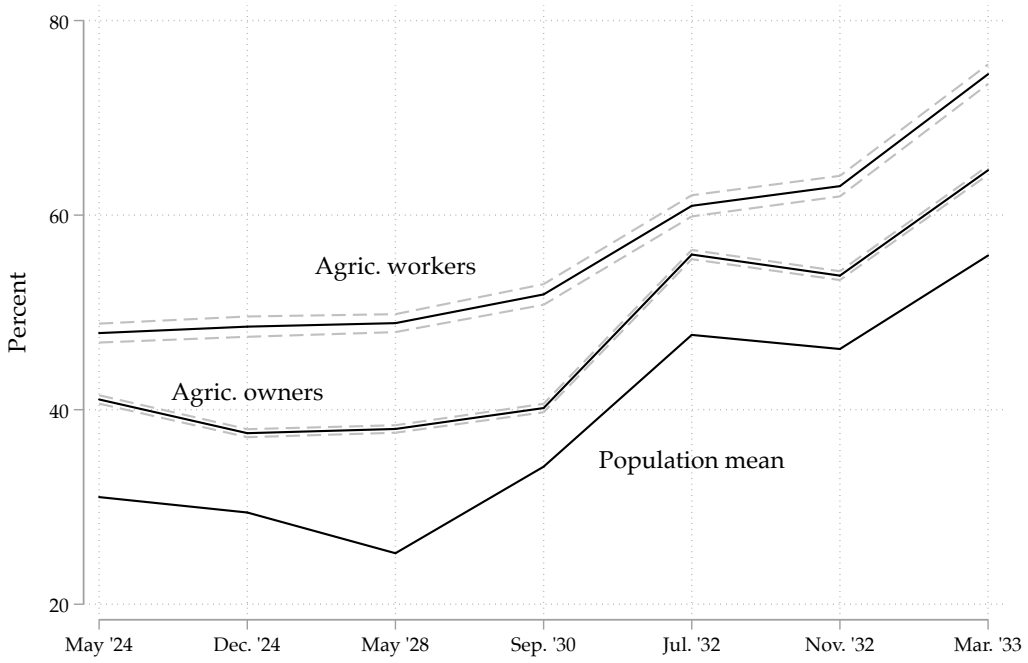
Dashed gray lines show 95% confidence intervals.

Table 3.5: Agricultural vote estimates for subgroups of districts above and below the median for share of peasant farms smaller than 5 hectares (standard errors in parentheses)

Election	Farm Owners		Farm Workers		Overall Protectionist Vote	
	Above Median	Below Median	Above Median	Below Median	Above Median	Below Median
1924M	0.371	0.455	0.408	0.515	0.357	0.445
	(0.003)	(0.003)	(0.007)	(0.008)		
1924D	0.324	0.430	0.448	0.517	0.325	0.418
	(0.003)	(0.003)	(0.006)	(0.008)		
1928	0.329	0.435	0.462	0.517	0.303	0.404
	(0.003)	(0.003)	(0.006)	(0.009)		
1930	0.364	0.436	0.511	0.561	0.418	0.408
	(0.003)	(0.003)	(0.006)	(0.009)		
1932J	0.515	0.601	0.604	0.631	0.515	0.579
	(0.003)	(0.003)	(0.006)	(0.008)		
1932N	0.482	0.575	0.609	0.643	0.499	0.581
	(0.003)	(0.003)	(0.006)	(0.008)		
1933	0.568	0.685	0.771	0.784	0.596	0.678
	(0.003)	(0.003)	(0.005)	(0.006)		

Farm workers were also consistently more protectionist than the population mean but show less consistency in the comparison between above-median and below-median small farm districts. The gap peaks at 11 percentage

Figure 3.13: Agricultural votes for protectionist parties in Reichstag elections



Dashed gray lines show 95% confidence intervals.

points in the May 1924 election and shrinks afterwards until it is only slightly more than one percentage point in the 1933 election, suggesting that among farm workers, voting become more homogeneous over time. The fact that farm workers were also consistently more protectionist than farm owners may be due to the fact that, as employees, they were less tied to specific trade policy interests based on the farm's output. A farm worker could easily move from a livestock farm to a grain farm. Furthermore, since workers were more likely to be found on larger farms than small family-run operations, they were likely to have more protectionist interests even in districts which, overall, were dominated by small farms.

3.8.2 Second stage regressions: Agricultural structure and protectionism

Since the algorithm does not just yield an aggregate value for λ but also district estimates, we can take this analysis a step further. I use the district level λs – the estimated vote of agricultural workers and farm owners returned by the ecological inference algorithm – as the explained variable and regress it on various indicators on the structure of agriculture to see how farmers in regions with a lot of livestock farming voted relative to farmers in areas with mostly grain farming. I run these regressions separately for each of the seven elections.

Instead of using a category for small farms as a proxy for livestock intensity as Lehmann[102] does, I can make use of the livestock statistics available at the district level for 1925 and use the number of cattle per hectare of farm land as well as the number of pigs per hectare in each district as explanatory variables.

Because of the high negative correlation between farm size and Catholicism and the strong political allegiance of Catholic voters to the Zentrum, I also control for the share of Catholics in the district (see, for instance, Evans[103]). Using estimates in a second-stage regression in such a way poses some econometric problems. I therefore include all control variables which appear in the regression also in the first-stage estimation (the ecological inference algorithm allows for the inclusion of covariates which also can be useful in avoiding aggregation bias). I furthermore use a weighted least-squares regression and weigh the observations by the standard errors calculated by the algorithm in order to account for the fact that we have varying levels of certainty about the district level estimates. This follows the advice of

102. Lehmann, "The German elections in the 1870s: why Germany turned from liberalism to protectionism."
103. Evans, *The German Center Party 1870-1933: A Study in Political Catholicism*.

Adolph et al.[104] and the example of Lehmann[105] and should ensure that we can reasonably interpret the standard errors given that the dependent variable itself has been estimated.

Table 3.6 shows the results.[106] The Catholic control variable is consistently negative as expected given the Catholic loyalty to the Centre party. This is not outweighed by the inclusion of the Catholic BVP in the protectionist vote.[107] As laid out earlier, I expect livestock farming to be associated with a lower vote for protectionist parties and possibly for this effect to be driven by pig farming rather than cattle farming. The coefficients for livestock farming in the table indeed break along the predicted lines. Farmers in areas with high shares of cattle farming are initially less protectionist in the 1924 elections, but by July 1932 are significantly more protectionist than the average farmer. However, farmers in areas with a higher share of pigs turn out to be less likely to vote for protectionism throughout the period. The coefficient is negative and highly significant in all elections except 1930. It is also bigger in absolute terms in the later elections than in 1924 (up to -0.297 in the 1930 election compared to -0.153 and -0.178) indicating that the split between protectionist and free-trade-supporting farmers widened with the onset of the agrarian crisis in 1928. The split also occurs among farm workers, but is less wide there. Finally, table A.4 in the appendix shows that the effect of pig farming is also significant for the overall protectionist vote, not just the agricultural vote, albeit with a smaller coefficient. All in all the higher protectionist vote among farmers therefore appears to be driven by large-scale grain farming supported by cattle farming.

104. C. Adolph et al., "A consensus on second-stage analyses in ecological inference models," *Political Analysis* 11, no. 1 (2003): 86–94.

105. Lehmann, "The German elections in the 1870s: why Germany turned from liberalism to protectionism."

106. The number of observations varies slightly despite the consistent units of observation because in some cases the standard error of the ecological inference estimates is 0 and the observations drop out when weighing by the inverse of the standard error.

107. I have run these regressions without inclusion of the BVP and find similar results.

Table 3.6: Weighted least squares regression results for the agricultural sector: livestock farming

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	1924M	1924D	1928	1930	1932J	1932N	1933
Cattle per ha	-0.253***	-0.0701	0.306***	-0.113**	0.198***	0.249***	0.154***
	(0.0494)	(0.0447)	(0.0571)	(0.0518)	(0.0479)	(0.0531)	(0.0443)
Pigs per ha	-0.153***	-0.178***	-0.297***	-0.0451	-0.176***	-0.239***	-0.257***
	(0.0330)	(0.0352)	(0.0407)	(0.0362)	(0.0378)	(0.0414)	(0.0350)
% Catholic	-2.97e-06***	-3.21e-06***	-1.96e-06***	-1.98e-06***	-3.23e-06***	-2.47e-06***	-2.39e-06***
	(2.89e-07)	(3.10e-07)	(3.68e-07)	(3.35e-07)	(3.27e-07)	(3.79e-07)	(3.45e-07)
Pop. Density	-0.000643	-0.000835	-0.000957	-0.000649	-0.000370	-0.000770	-0.000777
	(0.00103)	(0.000949)	(0.00120)	(0.000995)	(0.000907)	(0.000963)	(0.000921)
Population	1.56e-05	2.92e-05***	2.86e-05***	-8.92e-05***	-3.13e-05	-5.51e-05**	2.02e-05***
	(2.10e-05)	(5.78e-06)	(7.44e-06)	(2.31e-05)	(2.33e-05)	(2.58e-05)	(6.88e-06)
Constant	1.850***	0.0605	-0.282**	1.527***	0.174	0.112	0.577**
	(0.107)	(0.125)	(0.136)	(0.161)	(0.159)	(0.143)	(0.237)
Observations	821	821	821	821	821	821	821
R-squared	0.376	0.239	0.179	0.154	0.195	0.136	0.155

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls: Number of self-employed, manual workers, clerical workers, supporting family members, unemployed, electoral turnout. Dependent variable: Estimated agricultural vote (farm owners) for protectionist parties

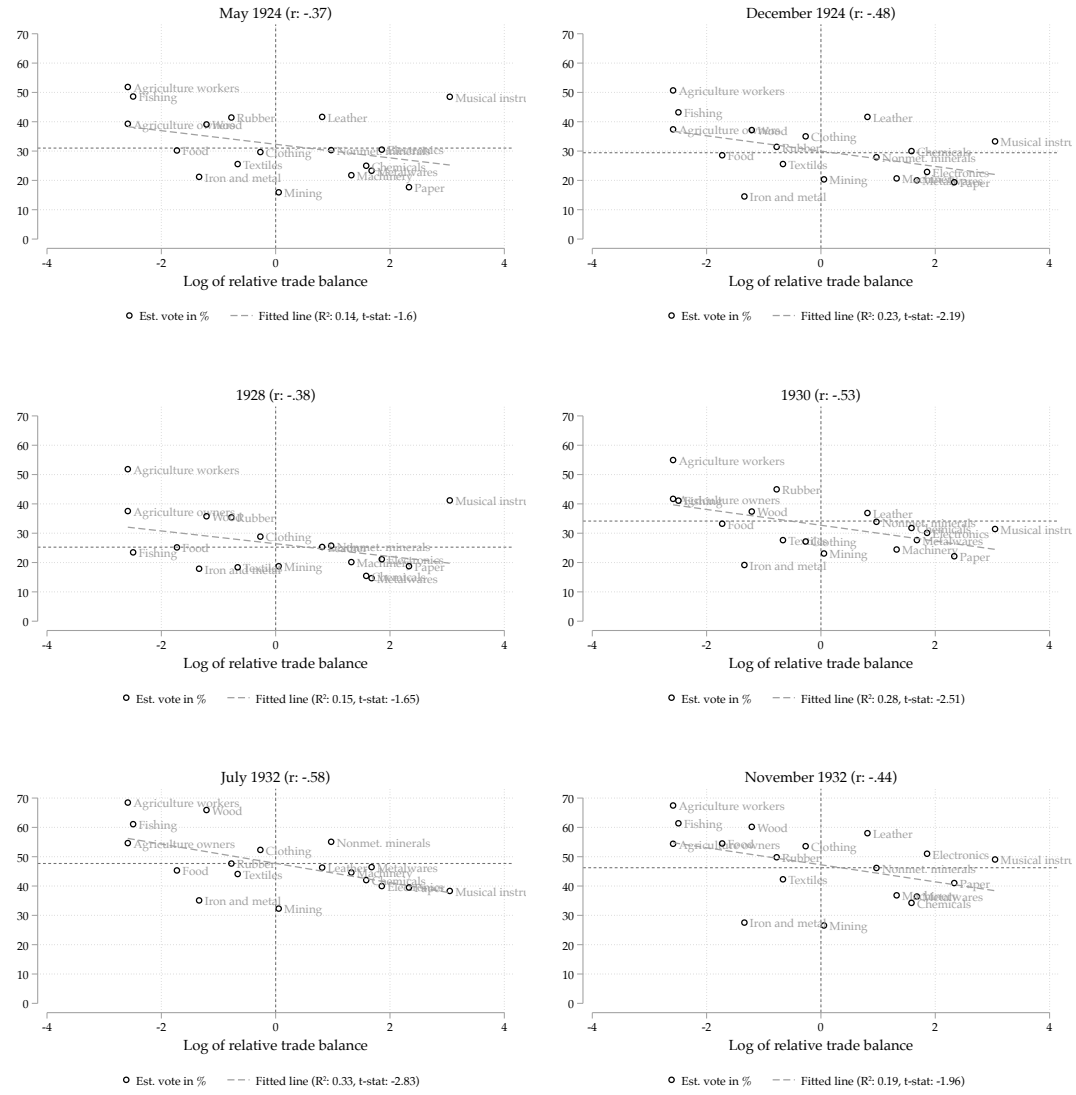
3.8.3 Industrial structure and protectionism

The algorithm can be expanded from the 2x2 (2 sectors, 2 voting decisions) to the RxC case, which allows us to estimate turnout and protectionist vote shares for several industrial categories at once. The resulting estimates for the protectionist vote are listed in table A.1 in the appendix. Figure 3.14 relates these estimates to the trade data. Each scatter plot shows the estimated vote for protectionist parties in per cent on the vertical axis and the log of the relative trade balance (that is, exports divided by imports) for the year 1927 on the horizontal axis.[108] The horizontal line marks the average vote for protectionist parties across all districts. If the log of the relative trade balance is greater than zero, a sector exports more than it imports and vice versa.

First of all we can see that every category sees a strong right-wing shift over the course of all the elections which matches the pattern in the overall electorate where protectionist parties rise from 25.2 % to 34.1 % and then to 47.7 %. However, there are big differences in the degree of the shift and the

108. Agricultural workers and owners are plotted separately, but use the same trade balance value for agricultural goods.

Figure 3.14: Estimated industrial sector votes for protectionist parties and log of relative trade balance in 1927



trade balance appears to play an important role here. Agricultural workers were the strongest supporters of protectionist parties throughout almost the whole period (with the exception of July 1932) closely followed by farm owners. The fishing, food, and woodworking sectors also consistently rank among the most protectionist (the food and beverages sector only drops below the average in the December 1924 election, long before the protectionist shift). In contrast, employees in the very export-oriented modern manufacturing industries like

machinery, chemicals, metalwares, and electronics were disproportionally liberal in almost every election. Furthermore, while the correlation between trade balance and protectionist vote was still fairly loose in the 1924 elections, it visibly increased as the Great Depression worsened in the early 1930s. The correlation coefficient is only -0.37 in May 1924, but it is already -0.48 in December 1924 and it increases in absolute terms to -0.58 by November 1932.

Notable exceptions from this pattern are iron and metal production and the mining sector, where vote shares were consistently below the average and far below the fitted line; and the leather and the musical instruments and toys sector, which often voted more protectionist than the district mean despite its positive trade balance. The musical instruments sector had very high vote estimates in the 1924 elections when trade policy was not an important issue yet but aligned itself fairly well with the general pattern by 1930. Of these, the iron and metal estimates are particularly striking since the heavy industry is considered one of the major proponents of protectionism and heavy industry representatives within the *Reichsverband der Deutschen Industrie*, the major industrial lobby organisation, supported the right-wing parties' course. This may reflect the strong representation of left-wing parties among workers in these sectors. The two sectors remain relatively close to the rest of the scatter plot for most elections but form a more pronounced outlier group in the November 1932 election.

3.9 Conclusion

Trade policy played an important role in the German elections of the early 1930s. Voters in agriculture and industry voted according to their trade policy interests at a time when Germany was at a crossroads between a moderate free trade regime and autarky. Agricultural voters in the Weimar Republic leaned more protectionist and were more likely to vote for protectionist parties through most of the 1920s. They became more radical over time but so

did the rest of the population. Whether or not agricultural voters tended to vote protectionist strongly depended on the structure of the local agricultural sector. Areas with a high intensity of pig farming were more prone to vote for liberal or moderate parties, while the vote for parties that favoured high tariffs was more strongly associated with a high share of large grain producers. Dairy farmers in contrast leaned towards protectionism at the height of the Great Depression and voted in line with the interests represented by the farm lobby. The estimated sign of the impact of dairy farming on protectionist votes changes right around the time of the Great Depression. This suggest that pig, dairy, and grain farmers were aligned on a continuum of trade policy interests with pig farmers the most liberal-leaning, grain farmers the most protectionist, and dairy farmers somewhere in between. As the whole sector shifted to the right on trade policy issues, the dairy sector flipped from pro-free-trade to protectionist. Nonetheless, the results do not confirm the theory of a unified agricultural bloc and they do not show a disproportionate increase in voter mobilisation or more radical voting in the agricultural sector *in general* as the driving force behind the overall shift towards protectionism.

In the industrial sector, the vote was split mostly along trade policy interest lines by 1932. All sectors moved to the right during the Great Depression but they did so to different degrees and at different times. Employees in most of the major exporting industries remained underrepresented in the protectionist vote.

One important factor that this analysis cannot address is the Zentrum, the party of political Catholicism. The ambiguous attitude of the party towards trade policy means that there is no sensible way to fit it into the binary framework of liberal and protectionist parties presented here. Nonetheless, as one of the biggest parties in the Weimar Republic, the Zentrum was politically extremely important and, in the person of Chancellor Heinrich Brüning, ultimately oversaw the introduction of some of the most severe protectionist measures. Brünings skepticism towards the abandonment of

the principles of free commerce is laid out in detail by Straumann..[109] The Zentrum's platform on trade hence warrants more research and the results of this chapter are only valid for the rest of the political spectrum. To what extent voters shifted from and to the Zentrum in response to its changing platform remains to be investigated by future research.

The results in this chapter also underline the importance of the protectionist intentions (in the sense of protection of domestic sectors) compared to broader monetary considerations in Germany's shift towards a more restrictive trade policy during the Great Depression. The parties that advocated higher tariffs did so explicitly in the interests of those economic sectors that stood to profit from these tariffs and the estimates of voter behaviour presented here suggest that support for such policies was indeed greater among those who stood to profit the most from them directly. The literature, most notably Irwin[110] and Eichengreen and Irwin[111], has cast doubt on to what extent the Brüning government pursued a deliberate agenda of trade restrictions, suggesting instead that protection was the side effect of a choice to not devalue the Reichsmark. As this chapter has shown, it is important to not underestimate the role of special interests despite the overwhelming importance of international monetary restrictions.

The data used in this analysis allow for a variety of further approaches to the question. One possibility is an analysis of the influence of technology on voting behaviour: the industrial data includes measures of machinery employed in each sector which would allow for an investigation of how more capital-intensive and technologically advanced regions voted relative to less developed ones. Of course, the usual caveats of ecological inference approaches apply here as well: we will not be able to retrieve the true values for any of the variables of interest and much uncertainty remains.

109. T. Straumann, *1931: debt, crisis, and the rise of Hitler* (Oxford University Press, 2019), 192.
110. Irwin, *Trade Policy Disaster: Lessons from the 1930s*.
111. Eichengreen and Irwin, "The slide to protectionism in the Great Depression: Who succumbed and why?"

Nonetheless, the rich data available opens the door to many different research endeavours beyond the question of who voted for the Nazis and why.

4

The Breakdown of German Trade in the Great Depression

4.1 Introduction

Germany experienced the biggest collapse in international trade in its post-war history during the Great Recession of 2008/09. History offers relatively few examples of sudden peace-time trade collapses such as these to compare them to, with the Great Depression as the most noteworthy 20th century case.[1] To what extent were these two collapses similar in their structure and

1. Early predictions of the extent of the 2020 recession caused by the COVID-19 pandemic suggested that it might be accompanied by an even bigger global trade collapse (Baschuk, "WTO Says Global Trade Collapse May Be Worst in a Generation"; Baldwin, "The Greater Trade Collapse of 2020: Learnings from the 2008-09 Great Trade Collapse") and the World Trade Organization projected in October 2020 that global trade would decline by 9.2 % in 2020, "similar in magnitude to the global financial crisis of 2008-09." (World Trade Organization, "Trade shows signs of rebound from COVID-19, recovery still uncertain," 2020, accessed October 13, 2020, `https://www.wto.org/english/news_e/pres20_e/pr862_e.htm`) However, as of March 2021, the WTO had only measured a 5.3 % decline in global

causes? In a recent paper, de Bromhead et al.[2] compare the trade collapse in the United Kingdom during the Great Depression (1929-33) with the Great Trade Collapse (GTC) during the Great Recession in 2009. Summarizing the literature, they report seven stylised facts about the GTC: There was no noteworthy increase in protectionism during the GTC.[3] The GTC was the most severe post-war trade collapse and "stands out as being unusually synchhronized."[4][5] The decline resulted from a drop in quantities traded rather than prices.[6] It occurred on the intensive rather than the extensive margin.[7] Trade in consumer and agricultural goods fell by a lot less than trade in automobiles and industrial supplies and durable goods trade fell more than non-durable goods trade.[8] Prices of non-differentiated goods declined by a lot more than those of differentiated goods.[9] And the trade collapse was

merchandise trade in 2020 with a "strong but uneven recovery" expected for 2021 (World Trade Organization, "World trade primed for strong but uneven recovery after COVID-19 pandemic shock"). It remains to be seen how the 2020 collapse will rank relative to the Great Recession and Great Depression once the pandemic and the global recession end. The WTO expected in March 2021 that "the effects of the pandemic will continue to be felt [in 2022] as this pace of expansion would still leave trade below its pre-pandemic trend."

2. A. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933," *European Review of Economic History* 23, no. 2 (2018): 123–144.

3. H. L. Kee et al., "Is protectionism on the rise? Assessing national trade policies during the crisis of 2008," *Review of Economics and Statistics* 95, no. 1 (2013): 342–346.

4. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933," 123.

5. J. O. Martins and S. Araújo, "The Great Synchronisation: tracking the trade collapse with high-frequency data," in *The Great Trade Collapse: Causes, Consequences and Prospects*, ed. R. Baldwin (2009), 101.

6. A. A. Levchenko et al., "The Collapse of International Trade during the 2008–09 Crisis: In Search of the Smoking Gun," *IMF Economic Review* 58, no. 2 (December 1, 2010): 214–253; J.-C. Bricongne et al., "Firms and the global crisis: French exports in the turmoil," *Journal of international Economics* 87, no. 1 (2012): 134–146.

7. M. Haddad et al., *Decomposing the Great Trade Collapse: Products, Prices, and Quantities in the 2008-2009 Crisis*, Working Paper, Working Paper Series 16253 (National Bureau of Economic Research, August 2010); Levchenko et al., "The Collapse of International Trade during the 2008–09 Crisis: In Search of the Smoking Gun"; Bricongne et al., "Firms and the global crisis: French exports in the turmoil."

8. Levchenko et al., "The Collapse of International Trade during the 2008–09 Crisis: In Search of the Smoking Gun"; Bricongne et al., "Firms and the global crisis: French exports in the turmoil"; G. Gopinath et al., "Trade prices and the global trade collapse of 2008–09," *IMF Economic Review* 60, no. 3 (2012): 303–328.

9. Gopinath et al., "Trade prices and the global trade collapse of 2008–09"; Haddad et al., *Decomposing the Great Trade Collapse: Products, Prices, and Quantities in the 2008-2009 Crisis*.

"geographically quite well-balanced, in the sense that imports and exports fell by a lot for all major trading partners."[10][11]

Based on these stylised facts, the authors point out important differences between the two crashes: A turn towards protectionist trade policy, very widespread during the Great Depression, was absent from the GTC. The GTC was shorter. It was not accompanied by severe deflation and therefore price declines contributed less to the overall decline in trade value.[12] But they also find various similarities between the two crashes, especially comparing the first two years of the Great Depression with the GTC:

> Both trade collapses took place along the intensive rather than the extensive margin (...); the same types of goods were particularly badly hit in both instances (...); and prices of differentiated durable manufactured goods barely fell on either occasion.[13]

They suggest that "common factors may have been at work" in the GTC in the USA and the Great Depression in Britain and that their findings are "supportive of theoretical accounts of the GTC emphasizing the composition of expenditure changes during major economic crises, or the relative sizes of firms operating closer to or further away from the margin between exporting or not."[14] However, they conclude with the caveat:

> It should be emphasized, however, that we have only provided evidence for one major interwar economy, the United Kingdom (...) It remains to be seen whether the features of the 1929-1933 British trade collapse that we have uncovered were common (...) to trade collapses in other economies during the interwar period.[15]

In this chapter, I investigate the trade collapse of a second major European economy in the interwar period: Germany. The Weimar Republic is an

10. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933," 124.
11. Levchenko et al., "The Collapse of International Trade during the 2008–09 Crisis: In Search of the Smoking Gun."
12. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933," 26.
13. Ibid.
14. Ibid., 27.
15. Ibid.

interesting case study for various reasons: It was Europe's biggest economy at the start of the Great Depression.[16] It was one of the richer countries per capita at the time, though not on par with Britain and with a very different economic structure: with 20 % of its labour force in agriculture (compared to 4 % in Britain), Germany was particularly vulnerable to changes in international trade in agricultural goods.[17] But Germany was also particularly dependent on foreign trade, both on the export and the import side: a large share of its labour force worked in exporting industries and after the territorial losses of World War I, the country had become less self-sufficient in agricultural products and raw materials.[18] It experienced the second-biggest drop in industrial production in Europe between 1929 and 1932, which fell by 39 % relative to its 1929 level (the UK's production, for comparison, only fell by 11 %).[19] Its gross domestic product plunged by 17 % in the same period, the biggest decline of all major economies apart from the United States.[20] It also experienced the biggest shift in trade policy: Before the onset of the Great Depression, Germany was on a path of economic reconciliation with its neighbours and was rebuilding its trade relations. The economic crisis then pushed the country towards an ever more radical trade policy, in particular to protect its agrarian sector, and the banking crisis of 1931 led to its adoption of strict foreign exchange controls, severely limiting the flow of free trade. From 1933 onwards, the Nazis pursued a goal of economic autarky. By the

16. S. Broadberry and A. Klein, "Aggregate and per capita GDP in Europe, 1870–2000: continental, regional and national data with changing boundaries," *Scandinavian Economic History Review* 60, no. 1 (2012): 79–107.

17. P. Temin and G. Toniolo, *The World Economy between the Wars* (Oxford University Press, 2008), 57.

18. Petzina, *Autarkiepolitik im Dritten Reich: Der nationalsozialistische Vierteljahresplan*, 15.

19. Temin and Toniolo, *The World Economy between the Wars*, 96.

20. Ibid., 136.

mid-1930s Germany had the highest average tariff rate of all major economies examined by Madsen[21] and Eichengreen and Irwin.[22]

I use a range of official German statistical sources for the analysis in this chapter including newly transcribed data on variety-level[23] annual trade. I also make use of various sources on German trade in the longer term including the GTC. The data I use let me distinguish imports both by products and countries, which allows me to go beyond the more aggregated analysis of the previous literature such as Höpfner.[24] I find that the German trade collapse in the Great Depression was similar in many aspects to the British one: Germany's terms of trade also increased sharply in the Great Depression (but not in the GTC). The trade collapse occurred primarily at the intensive margin. Prices declined more for non-differentiated goods than for differentiated ones. The goods categories in which trade declined the most are similar to those in which it declined during the GTC in the United States during the first two years, 1929 to 1931, but the relationship is inverted after 1931, just like in the UK. However, there are some important differences. The German trade slump lasted even longer and was deeper than the British one at the same time. The shift towards protectionist trade policy was even more radical. Unlike in Britain, automobile exports decreased far less than average in the first couple of years, then far more in the second half. possibly reflecting the fact that Britain began to recover in 1931 while Germany's depression worsened. Conversely, food exports collapsed earlier and more severely in Germany. Unlike the UK in the early Depression years, the German trade collapse was geographically imbalanced and affected different world regions to different

21. J. B. Madsen, "Trade barriers and the collapse of world trade during the Great Depression," *Southern Economic Journal*, 2001, 848–868.

22. 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.

23. A variety is a particular good from a particular country. Coal is a good, British coal and French coal are varieties.

24. Höpfner, *Der deutsche Außenhandel, 1900-1945: Änderungen in der Waren- und Regionalstruktur*.

degrees and at different times. Trade with countries of the Reichsmark Bloc, that would become an economic sphere of influence under the Nazis, was hit less than trade with the rest of Europe in the early years of the Depression, but then appears to have done worse in later years.

Levchenko et al.[25] discuss three hypotheses for what caused the disproportionate trade collapse – that is, a relative decline in trade value bigger than the simultaneous relative decline in GDP – of 2008/09: The first is that vertical linkages played a central role: a large number of intermediate goods in international trade – which often cross multiple borders – means that a drop in final demand "will decrease cross-border trade in intermediate goods."[26][27] Secondly, a contraction in trade credit could have caused the collapse because exporting firms lack the funds to produce the goods that would otherwise be traded. And thirdly, compositional effects may play a role, meaning that "trade fell by more than GDP simply because international trade occurs systematically in sectors that fell more than overall GDP."[28] Levchenko et al. find evidence that downstream linkages and compositional effects played a role in the GTC. Trade credit, on the other hand, appears to have only shrunk by a small amount.[29] The results of this chapter provide further support for the argument that compositional effects matter in trade collapses more generally, in line with the findings of de Bromhead et al.[30]

I begin this chapter with a look at the long-term development of German trade and show how the two trade collapses stand out. I summarize the literature on the structure of German Interwar Trade in section 4.2. In section 4.3 I look at the interwar trade collapse within the context of a long term view

25. Levchenko et al., "The Collapse of International Trade during the 2008–09 Crisis: In Search of the Smoking Gun."

26. Ibid., 236.

27. A good explanation of this can be found in O'Rourke ("Collapsing Trade in a Barbie World").

28. Levchenko et al., "The Collapse of International Trade during the 2008–09 Crisis: In Search of the Smoking Gun," 238.

29. Ibid., 245.

30. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933."

of German trade. Section 4.4 gives a brief overview of trade policy in the two crises. I then explain the data sources for the more disaggregated analysis in section 4.5. I compare the intensive to the extensive margin of trade in section 4.6, then disaggregate trade by goods categories in section 4.7 and geography in section 4.8. Finally, I look at unit value changes in section 4.9.

4.2 Evaluation of German Interwar Trade in the Literature

Höpfner[31] provides the most disaggregated long-term analysis of German trade in the first half of the 20th century, but focuses on a small number of sample years – for the interwar period the years 1929, 1934, and 1937 – making a more precise description of the trade decline in the Great Depression impossible. Since he is interested in long-term structural shifts, Höpfner deliberately avoids the Depression years and argues that the sample years 1929 and 1934 are only marginally affected by the crisis.[32] Two other analyses of German interwar trade go into more detail with regards to year-to-year changes, but also omit the Depression years: Hentschel[33] describes the years 1920 to 1929, Puchert[34] the years 1933 to 1939.

Hentschel emphasizes that both the initial acceleration as well as the slowdown of German trade in the hyperinflation period were driven by exports of manufactured goods. On the import side, the revival was initially focused on agricultural goods. Hentschel suggests that Germany's "dependence on imports of foodstuffs and raw materials was greater in

31. Höpfner, *Der deutsche Außenhandel, 1900-1945: Änderungen in der Waren- und Regionalstruktur*.

32. Ibid., 31.

33. Hentschel, "Zahlen und Anmerkungen zum deutschen Außenhandel zwischen dem ersten Weltkrieg und der Weltwirtschaftskrise."

34. B. Puchert, "Einige Probleme des deutschen Außenhandels 1933 bis 1939," *Jahrbuch für Wirtschaftsgeschichte/Economic History Yearbook* 30, no. 1 (1989): 61–82.

the 20's [sic] than before the First World War."[35] On the export side, both raw materials and agricultural goods began to play only a marginal role for Germany in the postwar years.[36] Industrial exports, meanwhile, grew very sluggishly in the late 1920s – Hentschel argues this is due to German industry's exessively slow adaptation to international demand changes – after an initially fast recovery in the early 1920s.[37] An early trend towards the later formation of a trade bloc in Southeastern Europe can already be seen in the fact that Germany lost its position in the finished goods markets everywhere "with the exception of south east Europe."[38]

In his discussion of the year 1934, Hoepfner mentions that the consumer goods sector saw a less severe decline than the industrial goods sector in the Great Depression.The economic revival of 1933 and 1934, accordingly, was mainly driven by a resurgence in the production of industrial goods while the consumer goods sector stagnated.[39] He notes that the negative trade balance in 1934 was primarily the result of a decline in exports, resulting from falling export prices for manufactured goods. The import side, on the other hand, "spared the German foreign exchange reserves" thanks to cheap food and manufactures and only marginally more expensive raw materials. The geography of German trade had shifted significantly as well: German exports to Europe had declined much more than to overseas countries.

Tooze explains the turnaround in Germany's trade balance – from a deficit of 2.9 billion Reichsmarks in 1928 to a surplus of 2.8 billion in 1931 – by the fact that "demand for foreign imports fell even more rapidly than German

35. Hentschel, "Zahlen und Anmerkungen zum deutschen Außenhandel zwischen dem ersten Weltkrieg und der Weltwirtschaftskrise," 116.

36. Ibid., 99.

37. Ibid., 116.

38. Ibid.

39. Höpfner, *Der deutsche Außenhandel, 1900-1945: Änderungen in der Waren- und Regionalstruktur*, 41.

sales abroad."[40] Overy[41] furthermore mentions the "decline in European capital export" as a factor in declining German trade during the 1920s: "it reduced demand for German goods in markets financed before the war by British and French credits."

4.3 The interwar trade collapse in long-term comparative perspective

4.3.1 Changes in Trade Value

The breakdown of trade in the Great Depression followed a period of rapidly increasing exports for Germany. Between 1925 and 1929, export growth had outpaced the growth of the real domestic product and imports by a factor of 2.5.[42] Teichert argues that the collapse of world trade occurred primarily in terms of values rather than volumes and that manufactures were hit harder than food and raw materials.

Figure 4.1 and 4.2 plot annual changes in German import and export values respectively. The graphs combine data from two sources: From 1950 onwards, data are available from the German Federal Statistical Office's (Destatis) publications. For years up to 1960 I use data collected by Hoffmann[43] available via the Leipzig Institute for Social Sciences (GESIS).[44] For years between 1950 and 1960 both sources are shown. The vertical lines denote the beginning of the Great Depression, the GTC, and the COVID-19 recession.

40. Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy*, 64.

41. R. Overy, *The Nazi Economic Recovery 1932-1938*, New Studies in Economic and Social History (Cambridge University Press, 1982), 6.

42. Teichert, *Autarkie und Großraumwirtschaft in Deutschland 1930-1939: Außenwirtschaftspolitische Konzeptionen zwischen Wirtschaftskrise und Zweitem Weltkrieg*, 13.

43. W. Hoffmann, *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, Enzyklopädie der Rechts- und Staatswissenschaft (Springer, 1965).

44. Hoffmann's trade statistics are based on official publications of the Reich Statistical Office.

The shaded areas show the World Wars.[45] I present the data in log points, which has the advantage that price and quantity changes add up to the total value change in each year and that annual changes are additive over several years. It is the recommended measure of relative change according to Törnqvist et al.[46] For small values, log point differences are approximately identical to relative changes, with a log point change of −0.1 equivalent to a 10 % decrease. In the following, I report the changes converted to percentages, wherever possible, in the interest of reading comprehension.

The Great Depression saw by far the biggest collapse in both imports and exports. The biggest year-on-year change was in 1931 for imports at −43.5 % and in 1932 for exports at −51.4 %. However, Germany experienced not just one but six consecutive years of decline in imports and five in exports. The decline began earlier in imports and lasted from 1927 to 1933. The cumulative decline in imports over this period adds up 1.219 log points (or 70.5 %).

45. Any long-term comparison of German economic data is subject to the caveat that there is no consistent territory called 'Germany' over the last two centuries. The Hoffmann data refer to Germany within its borders at the specific time. That means, the territory of the German Reich (without colonies) including Alsace-Lorraine up to 1917; the German interwar territories from 1918 to 1944, excluding Austria and the Sudetenland, but including the Saarland from 1934; and the territory of the Federal Republic of Germany (FRG, i.e. West Germany) from 1945 onwards, excluding West Berlin and the Saarland (W. Hoffmann, *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, Enzyklopädie der Rechts- und Staatswissenschaft (Springer, 1965), 2). Hoffmann is skeptical of any approach to estimate statistics for a consistent territory because "either there exists a unit 'German economy' or there doesn't" (ibid., 3). The FRG trade statistics also do *not* include trade with the German Democratic Republic (GDR). The statistical authorities of West Germany considered FRG-GDR trade to be domestic trade (ibid., 519), an approach that remained consistent until reunification in 1990 (Statistisches Bundesamt, ed., *Statistisches Jahrbuch für die Bundesrepublik Deutschland* (1950–2018)). I only discuss log changes and per GDP statistics in this section, which mitigates this problem to some extent but cannot entirely create consistency. The two World Wars do not only create gaps in the data but also divide the longer series into three internally (almost) consistent series. In the case of German reunification, I do not include log changes for the year 1990 since these result in large part from the territorial change. Where that is possible based on the available data I have included a graph for East Germany, specifically in figures 4.1, 4.2, and 4.3. These are based on data from Mitchell (*International historical statistics: Europe 1750-1993*) for the trade values and Heske ("Volkswirtschaftliche Gesamtrechnung DDR 1950-1989. Daten, Methoden, Vergleiche") for the GDP shares. In all other cases the graphs reflect data for West Germany only between 1949 and 1989.

46. L. Törnqvist et al., "How Should Relative Changes be Measured?," *The American Statistician* 39, no. 1 (1985): 43–46, eprint: `https://doi.org/10.1080/00031305.1985.10479385`.

The export decline started in 1929 and lasted until 1934 and cumulatively amounts to 1.174 log points (or 69.1 %).

How does this compare to the 2008/09 crisis? 2009 was the only year with a decline in the value of trade of Germany. The year-on-year log change only reached −0.193 log points (−19.3 %) for imports and −0.203 log points (−20.3 %) for exports. That makes the GTC the biggest trade collapse since the Great Depression, but it was a much smaller decline.

In comparison to de Bromhead et al.'s findings for the United Kingdom, the German trade collapse was much larger in both crises. The cumulative decline in the UK only reached 0.54 log points for imports and 0.65 log points for exports in 1929-33, about half of the German relative decline. In the 2009 GTC, the decline in the UK reached 0.076 log points (7.6 %) for imports, and 0.054 log points (5.4 %) for exports.[47]

It is worth pointing out at this point that these data only cover trade in goods. Since the importance of trade in services for overall trade has been rapidly increasing in recent decades (see, for instance, Eaton and Kortum[48]), this only paints a partial picture of the 2008/09 crisis. As Borchert and Mattoo[49] and Ariu[50] explain, trade in services did not collapse in the GTC. Ariu finds that services trade was considerably less elastic with respect to changes in GDP growth than goods trade. The overall relative decline in trade (for both goods and services) would therefore be considerably smaller and even more dwarfed by the Great Depression trade collapse than the data presented here suggest.

47. A. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933," *European Review of Economic History* 23, no. 2 (2018): 8.

48. J. Eaton and S. Kortum, "Trade in Goods and Trade in Services," in *World Trade Evolution: Growth, Productivity and Employment* (2018).

49. I. Borchert and A. Mattoo, "The crisis-resilience of services trade," *The Service Industries Journal* 30, no. 13 (2010): 2115–2136.

50. A. Ariu, "Crisis-proof services: Why trade in services did not suffer during the 2008–2009 collapse," *Journal of International Economics* 98 (2016): 138–149.

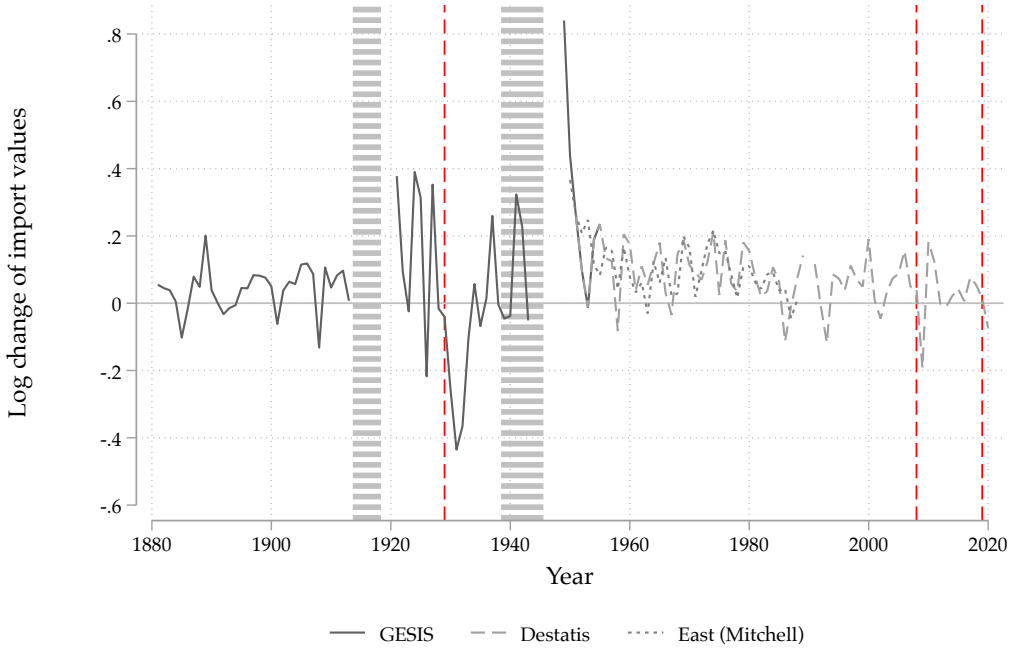
Figure 4.3 shows the ratio of imports and exports to GDP in Germany. The GDP series is based on data from *Global Financial Data*. The Great Depresssion saw by far the biggest decline in both imports and exports relative to GDP. From a local peak of 16.9 % the import share dropped by more than half to 7.4 % in 1933 and then further to a peacetime minimum of 5.3 % in 1936. The decline in the export share was initially slower, from 17.0 % to 8.6 % in 1933 but then accelerated and dropped to a low of 5.9 % by 1935. In contrast, the second biggest drop in both cases occured in 1990, but resulted not from a large decline in exports but an increase in GDP resulting from German reunification and the integration of the former German Democratic Republic into the territory of the Federal Republic. In 2009, imports and exports also shrunk faster than GDP, but to a far smaller degree. The decline during the GTC was only from 31.5 % in 2008 to 27.0 % in 2009 for imports. For exports, the decline was from 38.5 % in 2008 to 32.7 % in 2009. Germany differed in this from the UK where both shares actually increased in 2009. Pre-crisis export and import shares were already surpassed by 2011, only three years after the onset of the crisis. After the Great Depression, the damage to Germany's foreign trade was much more long-lasting. It took until 1974 for imports, and 1967 for exports, before the 1929 shares were surpassed.

4.3.2 Prices and Quantities

Interwar Germany was an industrialised economy, although its economy was more dominated by agriculture than that of the United Kingdom. Its exports in 1929 consisted of 73 % manufactured goods and only 27 % food and raw materials. On the import side, manufactured goods accounted for only 17 %, and food and raw materials for 82 %.[51] Since the Great Depression

51. Author's calculations based on Statistisches Reichsamt (*Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1929*, 5).

Figure 4.1: Annual log changes in German import values (in Reichsmark or Deutsche Mark), 1880-2017



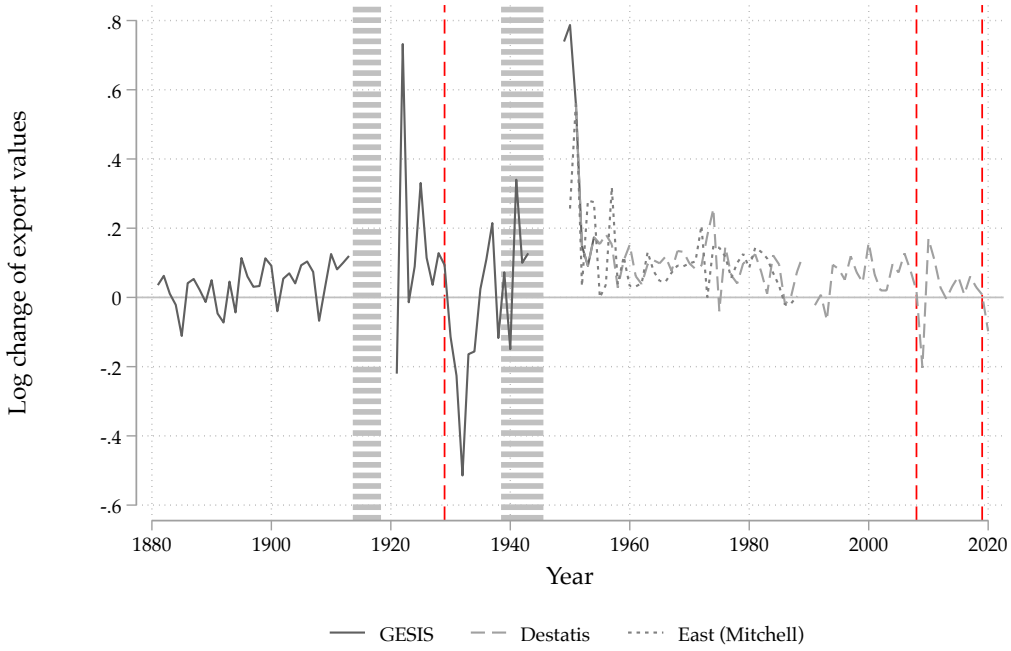
Sources: Hoffmann (1965), Statistisches Bundesamt (1950-2021), Mitchell (1998)

was accompanied by severe deflation in the global market, especially for agricultural products, Germany's terms of trade should have improved.[52]

Figure 4.4 and 4.5 show the development of export and import prices, again based on data from GESIS and the Federal Statistical Office. The Great Depression coincided with the biggest year-on-year collapse in both import and export prices. The cumulative collapse in import prices over the years 1929-1934 amounted to 0.75 log points (53.0 %). The export price collapse lasted longer, from 1927 to 1935, but only added up to a decline of 0.53 log points (41.0 %). The biggest year-on-year drop, in both cases in 1932, was less than half as deep for exports (12 %) as for imports (25 %).

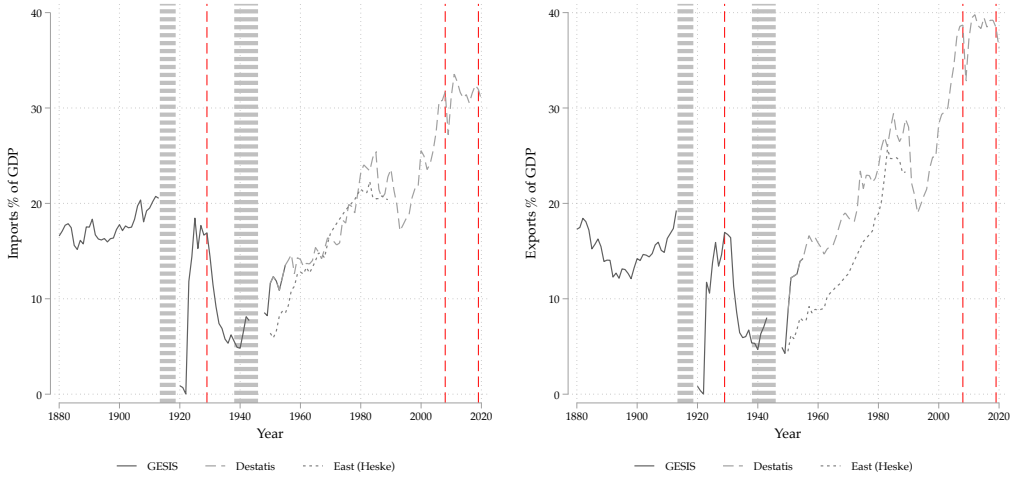
52. The terms of trade are a measure of the relative price of exports in terms of imports and can be calculated by dividing export prices by import prices. If an economy's export prices increase relative to its import prices, the economy can import more while maintaining balanced trade.

Figure 4.2: Annual log changes in German export values (in Reichsmark or Deutsche Mark), 1880-2017



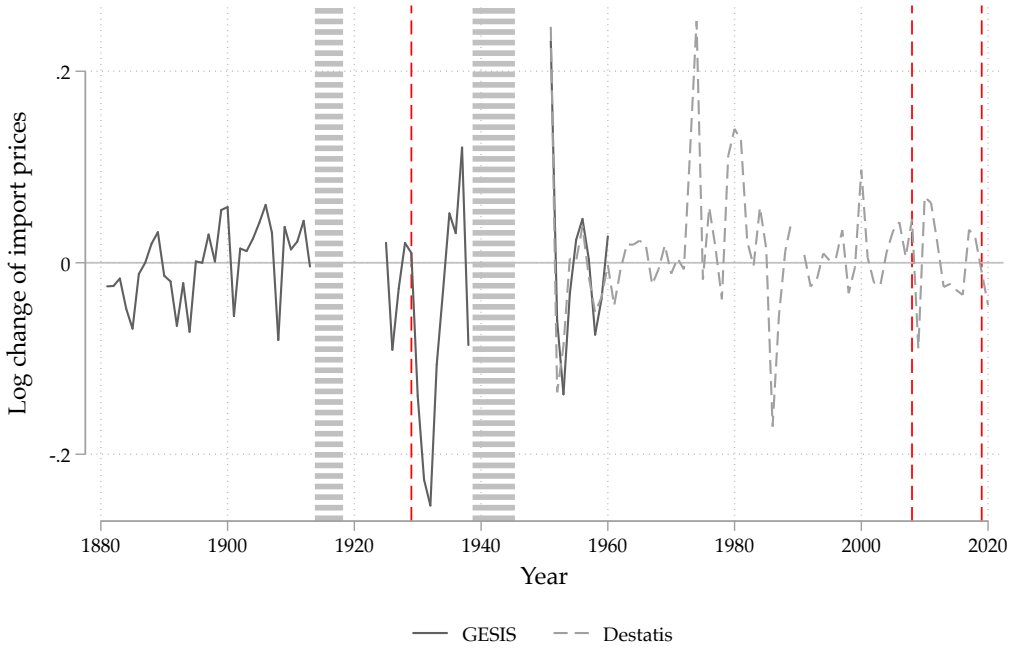
Sources: Hoffmann (1965), Statistisches Bundesamt (1950-2021), Mitchell (1998)

Figure 4.3: Import and export share of German GDP, 1880-2017



Sources: Hoffmann (1965), Statistisches Bundesamt (1950-2021), Mitchell (1998), Heske (2009)

Figure 4.4: Annual log changes in German import prices, 1880-2017



Sources: Hoffmann (1965), Statistisches Bundesamt (1950-2021)

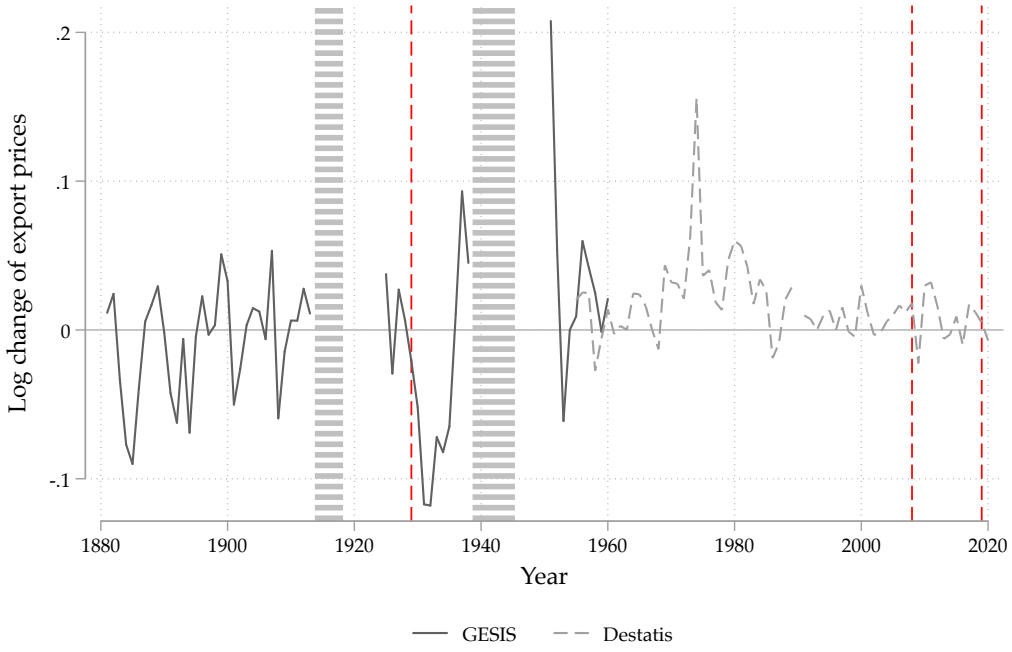
Export prices also fell in 2009, but at 0.02 log points (2 %), the drop was tiny in comparison to the Great Depression. Import prices, in contrast, rose in 2009 (but had gone through one of the biggest post-war drops (0.09 log points) in 2008 already).

Germany's terms of trade, depicted in figure 4.6 increased during both the Great Depression and the GTC. From 1929 to 1933, the terms of trade increased by more than 40 %, from an index value of 67.86 to 97.88 (with 1960 as the base year). The 2009 crisis saw a small increase in the terms of trade from 111.80 to 119.58. This is similar to the United Kingdom where the terms of trade also increased in both crises.[53]

Figures 4.7 and 4.8 show the change in German import and export volumes. The post-WWII volumes are collected from several editions of the Statistical Yearbook of the Federal Republic of Germany and adjusted to the same index

53. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933," 11.

Figure 4.5: Annual log changes in German export prices, 1880-2017



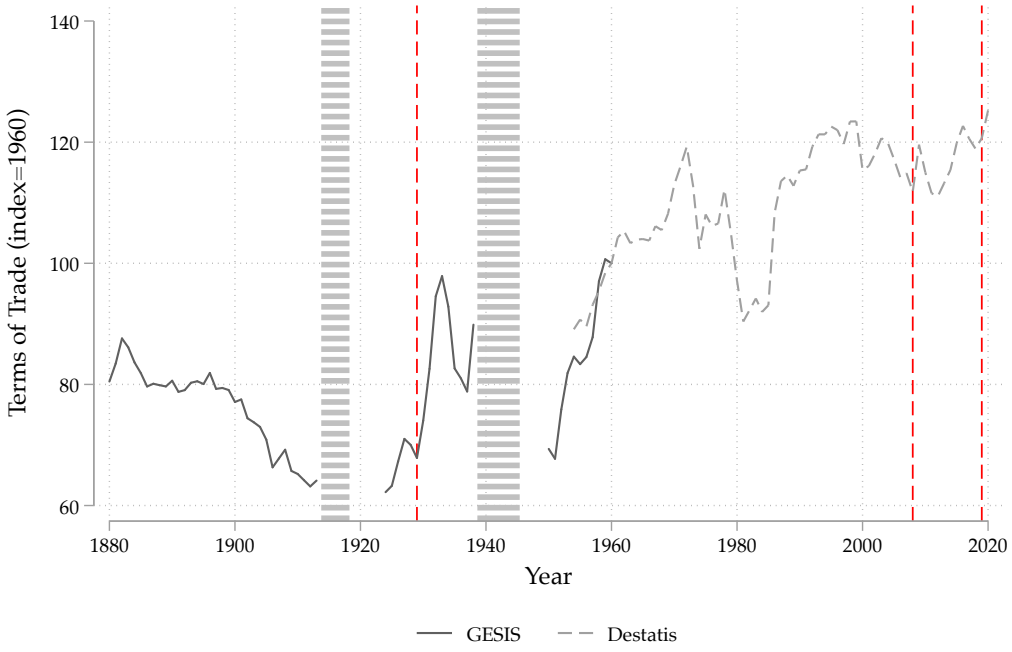
Sources: Hoffmann (1965), Statistisches Bundesamt (1950-2021)

base year. Volumes up to 1950 were again added from GESIS. For World War II I have expanded the series with data from the *Sondernachweis Außenhandel* (Special statistics on foreign trade) from 1944.[54]

Again the Great Depression stands out as the biggest peace-time decline in imports and exports, both year-on-year and cumulative, but due to the price decline, volumes fell by a lot less than values. Import volumes fell by 0.52 log points (or 40.6 %) between 1927 and 1932 with the biggest drop in 1931 (0.2 log points). Export volumes declined much more – by 0.73 log points (or 51.9 %) cumulatively – and at a later time: they were falling from 1929 to 1934 with the biggest drop of 40 % in 1932. During the GTC in 2009, import volumes collapsed by 14 % and export volumes by 20 %. This makes 2009 the second biggest peace-time year-on-year decline in the examined period after the worst year of the Great Depression in both cases, but it is still much

54. Statistisches Reichsamt, *Sondernachweis Der Außenhandel Deutschlands, Juli 1944* (1944).

Figure 4.6: German terms of trade, 1880-2017



Sources: Hoffmann (1965), Statistisches Bundesamt (1950-2021)

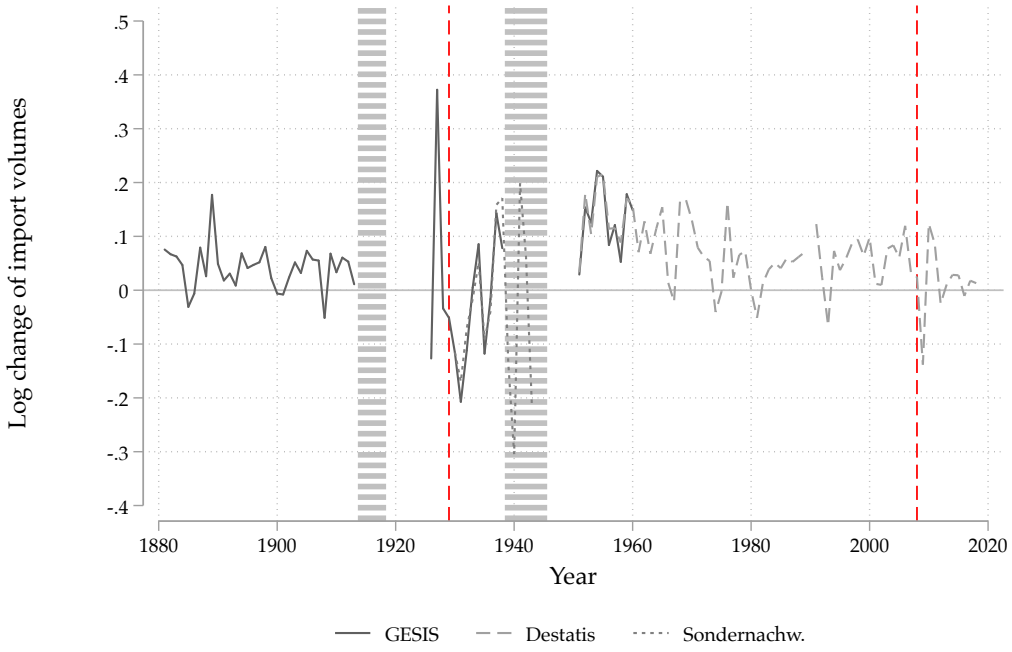
smaller than 1931/1932 and even more so in comparison to the cumulative Depression decline. The only other years in which trade volumes collapsed by more than 10 % are 1935 for imports and 1938 and 1975 for exports.

As with trade values, the German trade volume decline during the Great Depression exceeded that in the UK by far, not only in magnitude but also in duration. De Bromhead et al. find a cumulative decline of 0.37 log points in 1930 and 1931 after which trade volumes began to recover.[55]

I compare the price and quantity decline in table 4.1 for the four years of the Great Depression and for 2009. The price channel played a very important role in the collapse of trade values in the Great Depression but not in the Great Recession. In every Depression year the price share accounted for more than 50 % of the import decline. In 1933 it even accounted for the entirety of the import value decline as volumes had begun to recover. Prices

55. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933," 13.

Figure 4.7: Annual log changes in German import volumes, 1880-2017

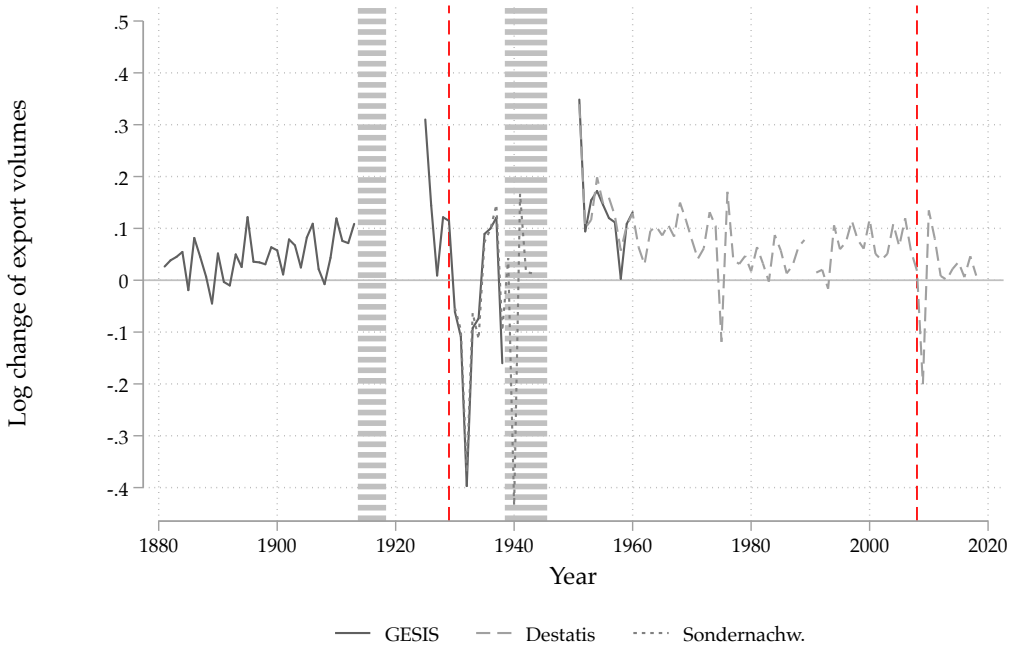


Sources: Hoffmann (1965), Statistisches Bundesamt (1950-2021)

contributed less to the import decline than in the United Kingdom in 1930 and 1931, but more to the export decline. In 1932 and 1933, this was reversed: The price share in exports in the UK rose to 0.7 and then to 3.4, much higher than in Germany where it was 0.2 and 0.4, respectively. On the import side, however, the price share increased steeply in Germany, to 0.7 and 1.0, while it remained lower in the United Kingdom.[56] Overall, however, just like in the interwar United Kingdom and unlike in the GTC, the German trade collapse was not just driven by a decline in volumes, with prices driving down the trade values by a lot. In 2009, German import prices were rising and the decline in export prices only accounted for 11 % of the value decline. The extreme deflation of the Great Depression contributed to the decline in values, but at different times than in the United Kingdom.

56. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933," 15.

Figure 4.8: Annual log changes in German export volumes, 1880-2017



Sources: Hoffmann (1965), Statistisches Bundesamt (1950-2021)

Table 4.1: Quantity and price shares of the Great Depression and GTC

	Imports					Exports				
	Germany				UK	Germany				UK
Year	Value	Price	Quantity	Price share	Price Share	Value	Price	Quantity	Price share	Price Share
1930	-0.258	-0.139	-0.119	0.539	0.912	-0.114	-0.052	-0.062	0.458	0.299
1931	-0.435	-0.226	-0.209	0.521	1.209	-0.226	-0.117	-0.109	0.518	0.357
1932	-0.366	-0.254	-0.112	0.694	0.403	-0.514	-0.118	-0.396	0.229	0.747
1933	-0.104	-0.106	0.002	1.019	0.969	-0.164	-0.072	-0.092	0.439	3.351
2009	-0.193	0.069	-0.261	-0.357	-0.273	-0.203	-0.022	-0.181	0.111	-0.688

Source: author's calculations based on GESIS and Destatis data.
UK price shares for comparison from de Bromhead et al. (2018)

4.3.3 Monthly Changes in Trade

The German Statistical Office collected monthly trade flows throughout the interwar period. This allows me to show at a higher frequency how fast the trade decline occurred.

Figure 4.9 shows the monthly total imports and exports over time between 1927 and 1939, first in absolute terms in the top graph and then in log changes relative to 12 months before in the bottom graph. Trade – both

imports and exports – fell most dramatically beginning around the time when Heinrich Brüning became chancellor and continued to fall throughout his chancellorship until it reached a plateau around the time of Hitler becoming chancellor. Both the start of the Brüning government and the introduction of exchange controls were accompanied by particularly steep month-to-month declines in the log changes (for both imports and exports in the former, only for imports in the latter case). The latter suggests that there was indeed a strong impact of the exchange controls on Germany's ability to trade despite the fact that that was not the primary goal of this policy. Trade became collateral damage in an attempt to prevent the outflow of capital without explicitly abandoning the gold standard (see, for instance, Eichengreen and Irwin[57]).

Figure 4.10a shows monthly values of imports and exports disaggregated by food, raw materials and intermediary goods, and finished manufactures. All three categories fell at a similar rate and at similar points in time. This graph also makes it clear that a big drop occured after the introduction of exchange controls in July 1931. Figure 4.10b shows monthly data for the 2008/09 trade collapse, disaggregated into agricultural goods, intermediary goods, capital goods, durable and non-durable consumer goods, energy, and other goods.[58] The decline here was also fairly synchronised across categories and occured over the course of a few months between October 2008 and January 2009, just after the Lehmann Brothers collapse in September 2008.

Figure 4.11 compares the two crises directly. It shows a monthly index of imports and exports up to 90 months after the start of the crises, using the same months as the starting points as Eichengreen and O'Rourke[59] for their

57. 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.

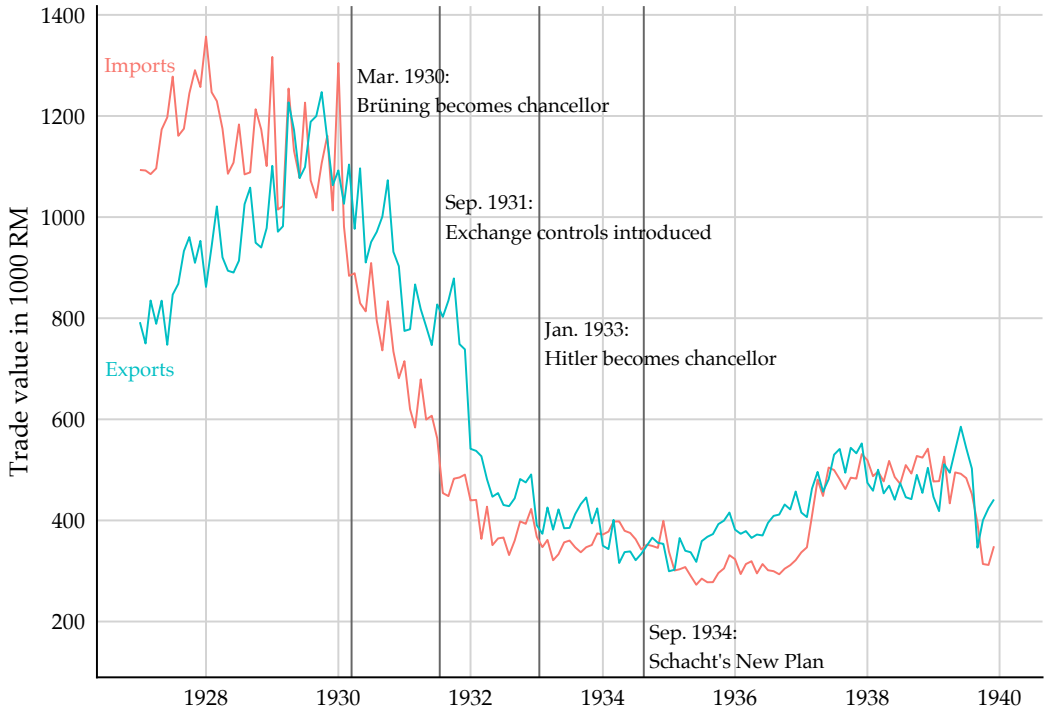
58. Data for the Great Depression is from various volumes of the *Monatliche Nachweise über den auswärtigen Handel*. Data for the GTC comes from the website of the Federal Statistical Office.

59. B. Eichengreen and K. H. O'Rourke, "A Tale of Two Depressions: What do the new data tell us?," 2010, `https://voxeu.org/article/tale-two-depressions-what-do-new-data-tell-us-february-2010-update#apr609`.

analysis of global trade. The graphs show that, month by month, trade in the Great Recession collapsed faster in Germany than in the Great Depression. Imports reached a minimum of 68 % of the April 2008 value after 16 months. Exports fell to 73 % by the same time. Afterwards, trade in 2009 began to recover already while trade from 1930 onwards continued to decline. It also never went through a recovery until the beginning of the war and remained at fairly stable 40 % of the June 1929 value from about 30 months after the onset of the crisis. Both imports and exports hit their nadir 72 months into the Depression at 31 and 30 %, respectively.

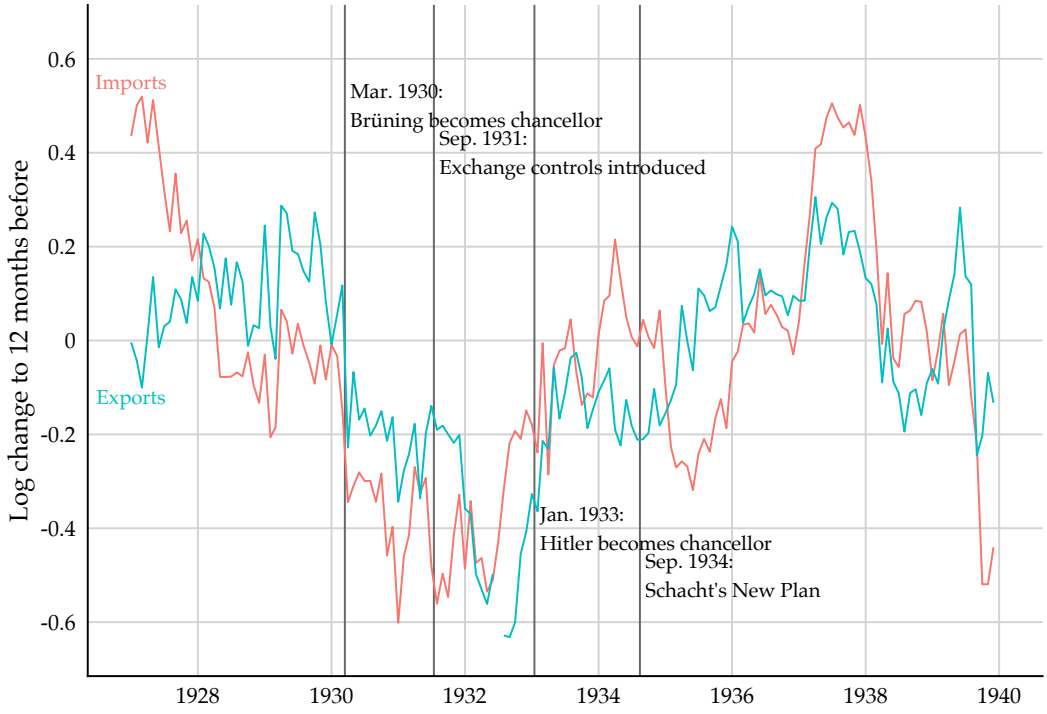
Figure 4.9: Monthly German imports and exports

(a) Absolute values



Author's calculations based on Monatliche Nachweise über den auswärtigen Handel

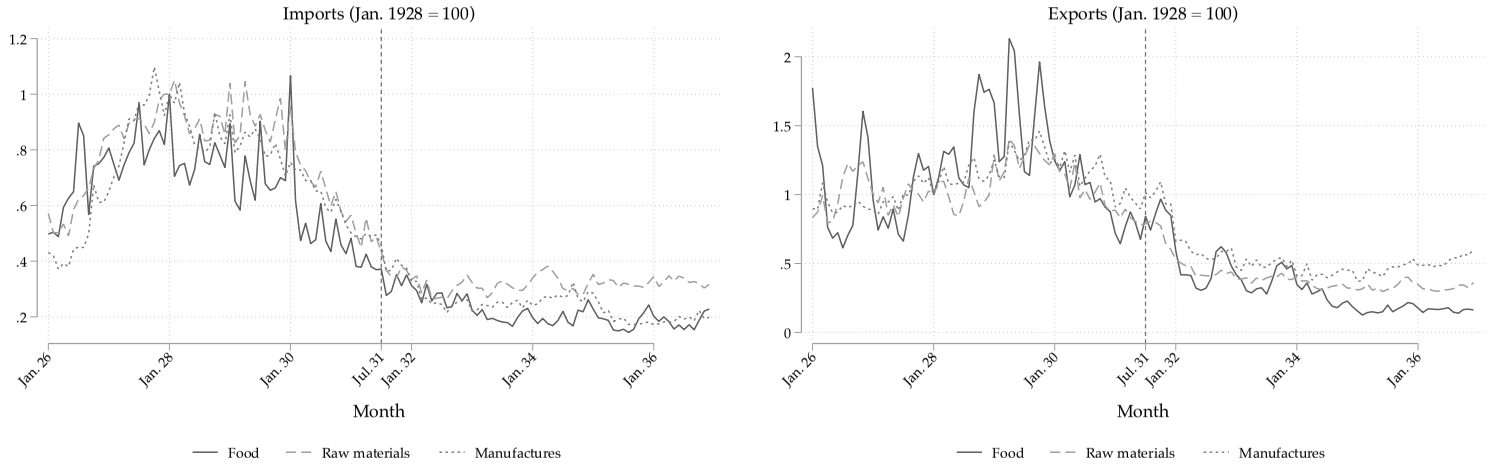
(b) Log changes



Author's calculations based on Monatliche Nachweise über den auswärtigen Handel

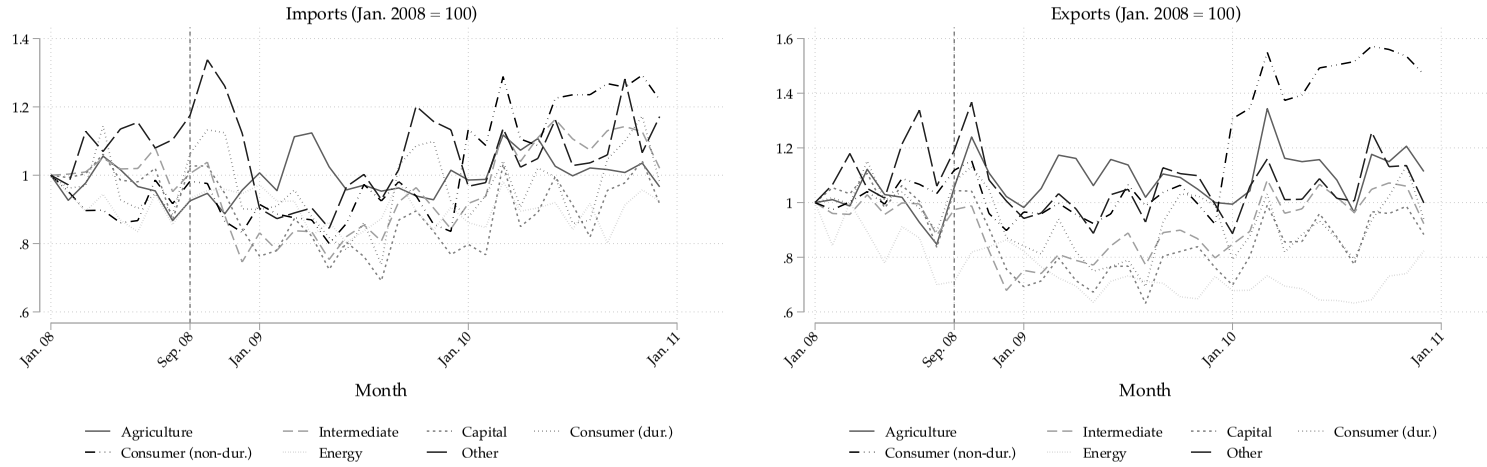
Figure 4.10: The two trade collapses in Germany month by month

(a) Import and Export values 1928-1934



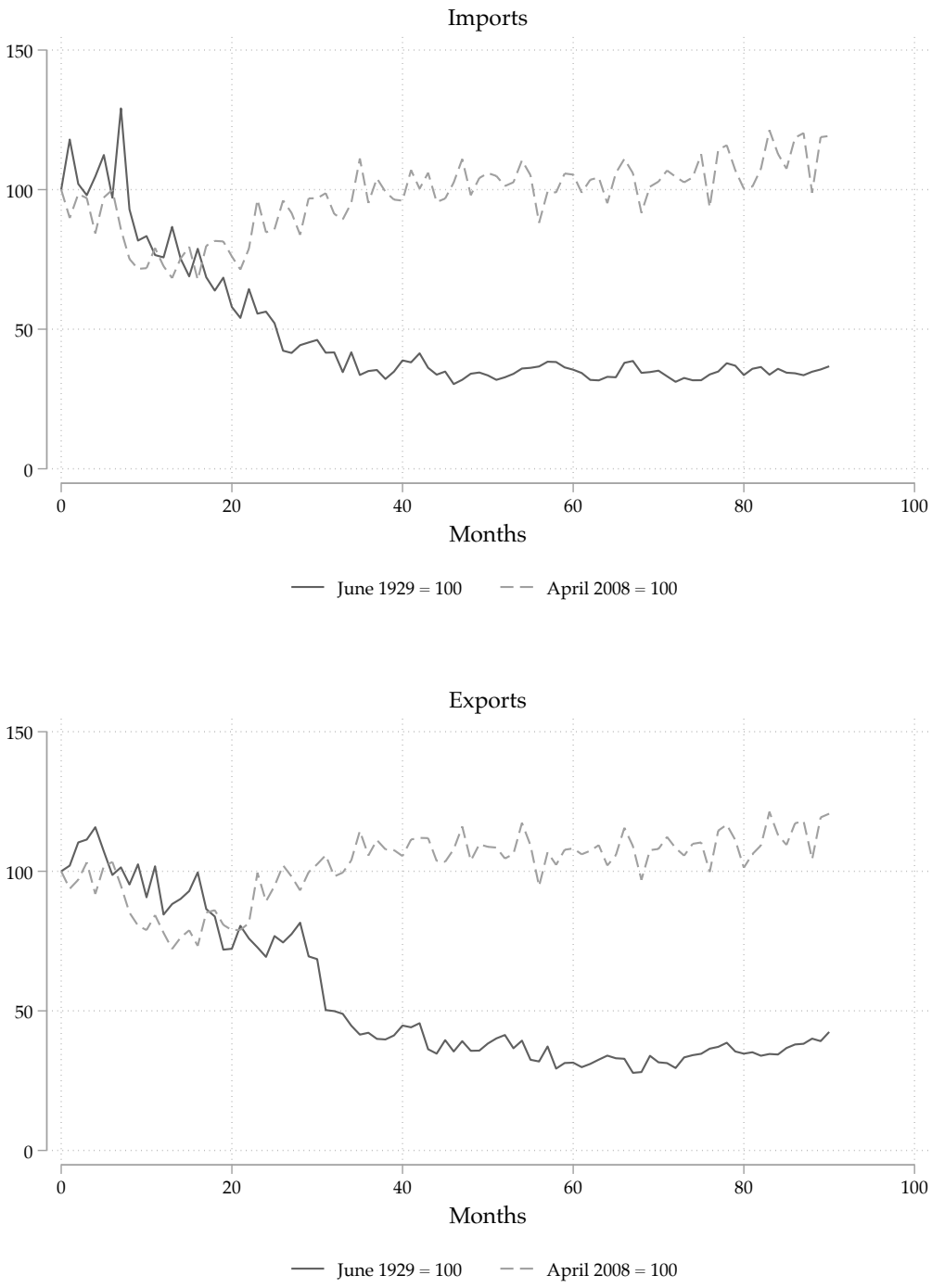
(b) Import and export values 2008-2010

mccorrect



Sources: Der auswärtige Handel Deutschlands (1928-30), Monatliche Nachweise über den auswärtigen Handel (1931-38)

Figure 4.11: Total German trade month by month in comparison



Sources: Author's calculation based on Der auswärtige Handel Deutschlands (1928-30), Monatliche Nachweise über den auswärtigen Handel (1931-44), Statistisches Bundesamt (1950-2021).

4.4 The Role of Trade Policy

While there was a lot of concern about increased protectionism in the early stages of the GTC (see, for instance, Baldwin and Evenett[60]), protectionist policies did not increase much in the following months. Bown and Crowley[61] show that protectionism actually reacted more strongly to economic downturns in the decades *before* the crisis and that a model based on data from these decades would have predicted a much bigger increase in protection than actually occurred. Rising domestic unemployment and a global economic contraction "combined to create a perfect storm of conditions for a large increase in new import protection, given the way policymakers in the US and EU had historically responded"[62] – but that did not actually happen. Temporary trade barriers were introduced for a mere 0.9 % of non-oil imports in the United States, 1.9 % in the European Union. Bown and Crowley find that in the Great Recession, countries "'switched' from their historical behavior (...) they shifted new import protection away from those trading partners that were contracting and toward those experiencing relatively stronger economic growth."[63] This, they argue, was a "particularly important contributor to the relatively low levels of import protection that arose."[64] Bems et al.,[65] in a survey on the causes of the GTC, find that "protectionism (...) played essentially no role in explaining the trade collapse, at least in the aggregate." Eaton et al.[66] largely agree with this assessment but still find a non-neglectable contribution of "trade frictions" in general accounting for roughly

60. R. Baldwin and S. Evenett, "The crisis and protectionism: Steps world leaders should take," *VoxEU.org*, 2008,

61. C. P. Bown and M. A. Crowley, *Import protection, business cycles, and exchange rates: Evidence from the Great Recession* (The World Bank, 2012), 59.

62. Ibid.

63. Ibid., 62.

64. Ibid., 63.

65. R. Bems et al., "The Great Trade Collapse," *Annual Review of Economics* 5, no. 1 (2013): 2.

66. J. Eaton et al., "Trade and the global recession," *American Economic Review* 106, no. 11 (2016): 3405.

11 % of the trade decline relative to GDP. In contrast, Yilmazkuday[67] uses a dynamic stochastic general equilibrium (DSGE) trade model to test competing theories and finds a fairly big contribution of 28 % of the overall decline attributed to protectionist policies, with productivity and demand shocks only playing "negligible roles." This would make protectionism the second-biggest contributor to the GTC after the decline in retail inventories, but ahead of intermediate-input trade and trade finance.[68] Evenett[69] documents the rise of protectionist measures during the economic downturn and finds that Germany, after Russia and Argentina, comes in third in a ranking of the number of implemented discriminatory measures in trade policy. 26 % of sectors and 50 % of Germany's trading partners were affected by the measures. He emphasizes that the protectionism of 2009 was "bad, but not a repeat of the 1930s."[70] However, he also argues that "[j]ust because a pot of water isn't boiling doesn't mean that it's cold" and that the comparison to the 1930s may lead observers to underestimate the damage done by the 2009 measures.

During the Great Depression, on the other hand, trade policy increased dramatically in many countries, including Germany. Eichengreen and Irwin[71] point out that "there was considerable variation in the extent to which countries imposed protectionist measures. While some countries raised tariffs sharply and imposed strict controls on foreign exchange transactions, others tightened trade and exchange restrictions only marginally." They argue that it was adherence to the gold standard that restricted countries' policy alternatives and lead to a more extreme trade policy response to the crisis. Germany consequently raised tariffs a lot between 1929 and 1933

67. H. Yilmazkuday, *The Great Trade Collapse: An Evaluation of Competing Stories*, technical report (2019).

68. Ibid., 19.

69. S. Evenett, "Crisis-era protectionism one year after the Washington G20 meeting," in *The Great Trade Collapse: Causes, Consequences and Prospects*, ed. R. Baldwin (Vox.EU, 2009).

70. Ibid.

71. Eichengreen and Irwin, "The slide to protectionism in the Great Depression: Who succumbed and why?," 871.

and introduced harsh foreign exchange controls in 1931, a measure that Irwin[72] calls "perhaps the most draconian trade policy measure used during this period." Of the countries Eichengreen and Irwin investigate, Germany had by far the highest average tariff rate in 1935 at about 30 % *ad valorem* equivalent, compared to less than 10 % in 1928.[73] To what extent trade policy indeed contributed to the collapse in trade has been debated in the literature. Eichengreen and Irwin[74] and Wolf and Ritschl[75] downplay the role of trade bloc formation in the shifts in international trade. Madsen[76] attributes 8 % of global trade decline from 1929 to 1932 to increases in tariffs. de Bromhead et al.[77] find a large effect on trade in the United Kingdom: Increased protection lowered UK imports by 10.8 % in 1933, equivalent to 24.7 % of the total fall in imports between 1929 and 1933.[78] Adam,[79] who uses more aggregate data from multiple countries, finds that "had average tariff and non-tariff trade barriers remained at their 1928 level, total international trade would have been 64.6 % higher in 1937."

Graph 4.12 shows the development of ad valorem equivalent tariffs in Germany over the long term and graph 4.13 zooms in at the years surrounding the two trade collapses, the interwar period and the first two decades of the 21st century.[80] The Great Depression led to a steep rise in tariffs from

72. D. Irwin, *Trade Policy Disaster: Lessons from the 1930s*, Ohlin Lectures (MIT Press, 2012), 29.

73. Eichengreen and Irwin, "The slide to protectionism in the Great Depression: Who succumbed and why?," 881.

74. 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.

75. 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.

76. J. B. Madsen, "Trade barriers and the collapse of world trade during the Great Depression," *Southern Economic Journal*, 2001, 848.

77. A. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection," *American Economic Review* 109, no. 2 (2019): 325–52.

78. Ibid., 347.

79. M. C. Adam, *Return of the tariffs: The interwar trade collapse revisited*, Discussion Papers 2019/8 (Free University Berlin, School of Business & Economics, 2019).

80. These tariff rates were calculated as a fraction of total government tariff revenues and total imports, similar to Eichengreen and Irwin ("The slide to protectionism in the Great Depression: Who succumbed and why?"). The source for the custom revenues in the

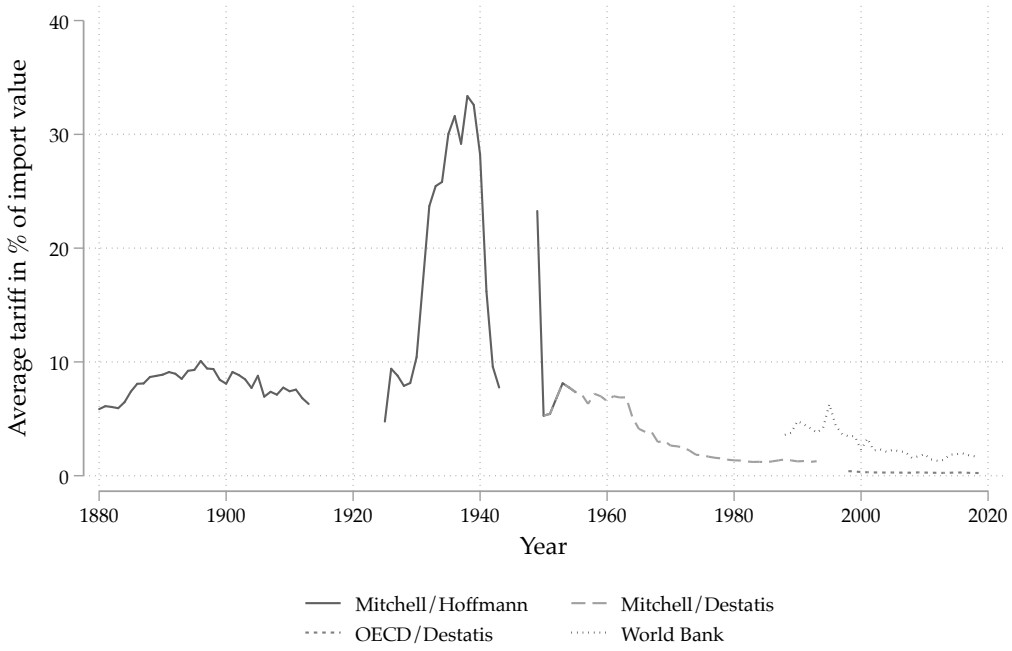
less than 8 % in 1928 to over 30 % in 1933. Meanwhile, tariffs in the Great Recession were very low on average (at less than 1 %, mostly due to the fact that most imports to Germany were coming from the European Customs Union and were therefore not subject to tariffs, but also at less than 2 % for the entire Customs Union) and remained low apart from a brief spike that probably is mostly the result of compositional effects.

4.5 Disaggregated Data

For an analysis of the trade collapse disaggregated by countries and commodities, I use data from various official German trade statistics published by the Reich Statistical Office (*Statistisches Reichsamt*). The trade statistics include 98 trade partners in 1925-27, 96 in 1933. For each category of goods, the total trade value and volume as well as a list of the most important trade partners are included. For the years 1925 to 1929 the data come from volumes of the *Statistics of the German Reich*. From 1930 onwards, country specific values were published in the December edition of the *Monthly Statistics on Foreign Trade* instead. In both cases a country's trade value and volume are listed if the sum of exports to and imports from this country in this good category surpassed 20,000 Reichsmark over the calendar year. From 1932 onwards, this threshold was lowered to 12,000 Reichsmark. In most categories this threshold is low enough that the listed countries constitute the entirety of trade partners (or

interwar period is Mitchell (*International historical statistics: Europe 1750-1993*). The source for the 21st century customs revenues is the Organisation for Economic Cooperation and Development ("Details of Tax Revenue - Germany"). In the latter case I subtracted total government revenues from net revenues without customs duties to obtain the value of customs revenues. The import values are from the same sources as above. I am excluding the inflation years in the early 1920s. It is worth noting that aggregate measures of protection like this cannot account for endogenous demand shifts from high-tariff to low-tariff imports and are therefore inevitably an underestimate of the true shifts in trade policy (see, for instance, Anderson and Neary ("Measuring the restrictiveness of trade policy," 153)), but it is the only measure available consistently over such a long period. In the following chapter of this dissertation, I disaggregate trade policy measures more for the interwar period and discuss unweighted measures.

Figure 4.12: Annual average ad valorem equivalent tariff on German imports, 1880-2017



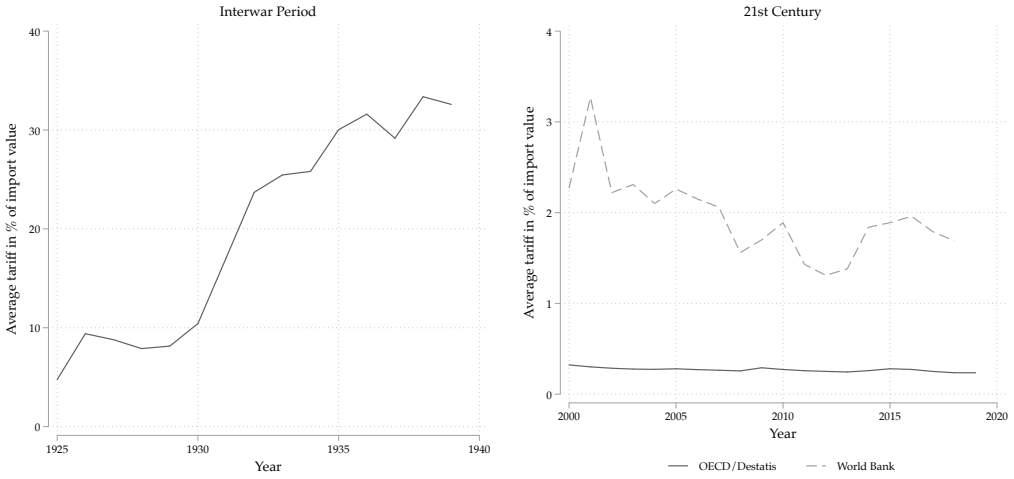
Sources: Author's calculations based on Mitchell (1998), OECD (2018) and trade data from Hoffmann (1965), Statistisches Bundesamt (1950-2021)

the difference is so small that it is lost by rounding). Starting in 1934, the threshold was dropped for imports and all countries of origin are included.

For the disaggregated analysis in this chapter, I use two data sets: The first is the whole universe of German trade disaggregated by category of goods in the years 1929, 1931, and 1933[81]. I have collected total values and volumes (not disaggregated by trade partner) for more than 2000 traded product categories, on both the import and the export side. Figure 4.14 and 4.15 map the distribution of imports and exports in 1929 based on this data set. Germany predominantly imported agricultural goods and exported machinery and other manufactured goods. Figures 4.16 and 4.17 show the breakdown of trade by country.

81. I expand this to 1927 and 1934 for robustness checks in the appendix.

Figure 4.13: Annual average ad valorem equivalent tariff on German imports, 1925-1939 and 2000-2017



Sources: Author's calculations based on Mitchell (1998), OECD (2018) and trade data from Hoffmann (1965), Statistisches Bundesamt (1950-2021)

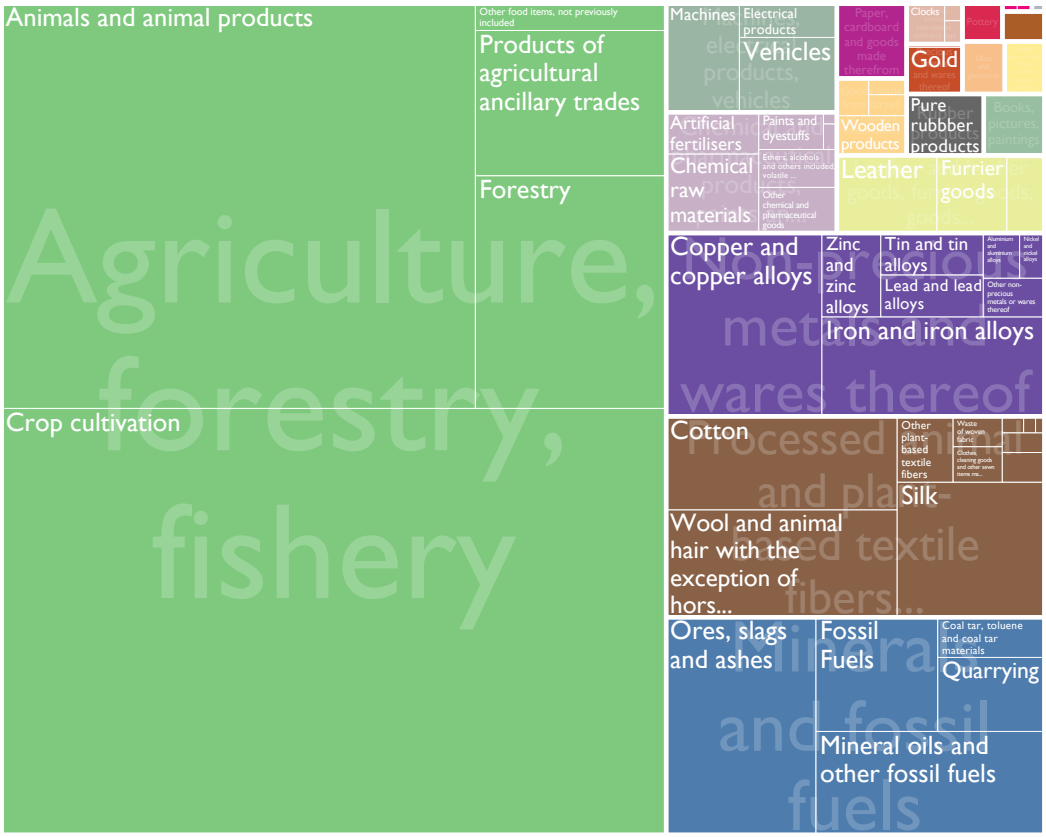
The second data set is a sample of German imports that is further disaggregated by trading partner and includes 574 product categories and 50 trade partners, mostly based on data collected by Markus Lampe and Kevin O'Rourke for a larger project on interwar trade. Both data sets are based on the same sources as described above.

The products were chosen as a representative sample of German interwar imports based on their importance in global trade and cover the whole range of the German catalogue of goods traded. Figures 4.18 and 4.19 show that imports in the sampled goods indeed behaved similarly to the overall imports. Figure 4.18 shows the value of annual imports indexed to 1925 and shows that the sample traces the total quite closely. Similarly, figure 4.19 illustrates the geographical composition of the sample: The share of imports from the Reichsmark Bloc[82] as well as the major Western trade partners[83] are graphed

82. Austria, Yugoslavia, Hungary, Turkey, Bulgaria, Greece, and Romania in Europe, as well as Brazil in Latin America.

83. France, the United Kingdom, the Netherlands, and the United States

Figure 4.14: Tree map of German imports in 1929 by category



Source: Author's calculations based on Der Auswärtige Handel Deutschlands im Jahr 1929

for both the sample and the total. The trade partners chosen include 19 of the 20 biggest German import sources in 1925 and 26 out of the top 30.[84] The map in figure 4.20 illustrates which countries are included and a full list is provided in the appendix.[85] Furthermore, the product categories account for a fairly consistent share of total German imports as shown in figure 4.21.

For the analysis at hand I focus on the same years as de Bromhead et al., 1929 to 1933, which allows for the most accurate comparison and encapsulates the years from the onset of the Great Depression to the beginning of recovery in Germany. Imports began to fall slightly already in 1928 already and

84. These numbers increase to 20 of the top 20 and 27 of the top 30 in 1938.

85. This map is based on a lightly edited shapefile of the world in 1938 from `http://web.archive.org/web/20080328104539/http://library.thinkquest.org:80/C006628/download.html`

Figure 4.15: Tree map of German exports in 1929 by category

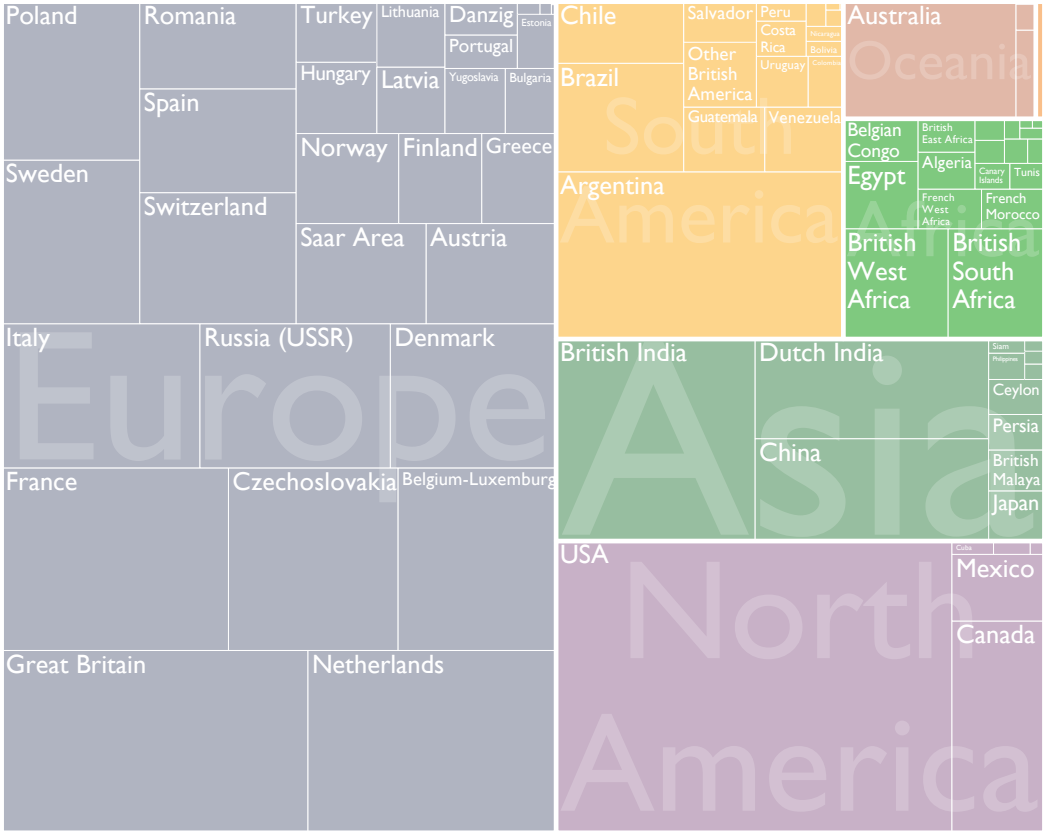
Source: Author's calculations based on Der Auswärtige Handel Deutschlands im Jahr 1929

exports did not stop falling completely until 1935, but almost the entire decline occurred between 1929 and 1933 and the Depression years provide convenient bookends for the years of the most severe trade collapse. 1929 to 1933 are also the only years in which both imports and exports were falling, and 1931 constitutes a break point in Germany, albeit for other reasons than in the United Kingdom: While the UK abandoned the gold standard and thus set itself on a path towards recovery, Germany introduced exchange controls and experienced an even more severe crisis in the following two years.[86]

Are the official statistics, upon which I base my analysis, reliable? It appears so. The existing literature generally treats German trade statistics

86. As a robustness check, I expand the analysis to the years 1927 and 1934 in the appendix.

Figure 4.16: Tree map of German imports in 1929 by source country

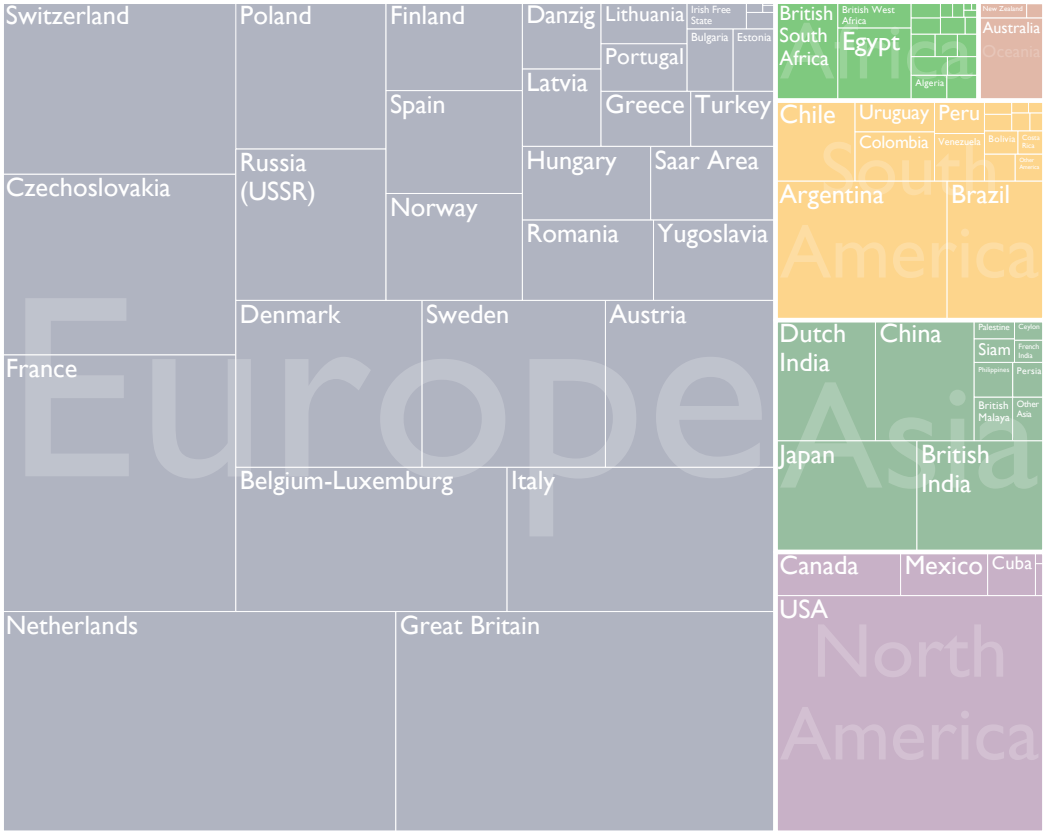


Source: Author's calculations based on Der Auswärtige Handel Deutschlands im Jahr 1929

from this period as trustworthy. Hungerland[87] notes that from 1880, a new law on goods-level foreign trade statistics of the German tariff area "made declaration of all international trade flows and their country of origin or destination mandatory, regardless of them being subject to tariffs or not." As Torp explains in his monograph on German trade policy before World War I, three key innovations made statistics more reliable after 1880s: In addition to the mandatory declaration of all commodity trade, "all entries on imports and exports now systematically recorded values as well as quantities" (although the declaration of values remained subject to "considerable uncertainties") and "the countries of origin and destination of imported and exported

87. W.-F. Hungerland, "On Germany and International Trade in the First Globalisation" (PhD Thesis, Humboldt-Universität zu Berlin, 2018), 11.

Figure 4.17: Tree map of German exports in 1929 by destination



Source: Author's calculations based on Der Auswärtige Handel Deutschlands im Jahr 1929

goods were also recorded."[88] Torp concludes that for the pre-WWI period "a glance at the trade statistics of other countries shows that we can [...] regard the statistical material available for German foreign trade as relatively reliable and satisfactory."[89]

Hoffmann[90] raises some doubts about pre-1905 data because they relied on the estimates of experts rather than exporters' reports. While the import data from 1905 to 1928 are still partially built on estimates, Hoffmann considers the data from 1928 onwards to be "entirely reliable,"[91] an assessment

88. C. Torp, *The challenges of globalization: economy and politics in Germany, 1860-1914* (Berghahn Books, 2014), 15.
89. Ibid., 19.
90. Hoffmann, *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, 528.
91. Ibid., 532.

Figure 4.18: Index of import value in the sample and total

Source: Author's calculations based on Der Auswärtige Handel Deutschlands (1928-30), Monatliche Nachweise über den auswärtigen Handel (1931-38)

shared with Tooze[92] according to whom new legislation "guaranteed the accurate registration of import and export values."[93] Even under the Nazis, government statistics were at least initially still reliable, as Tooze[94] describes. Hungerland, who studies German trade in the Wilhelmine era, describes that unit value variation already increased after 1890, suggesting that the reported values came closer to market prices from that point onwards.[95]

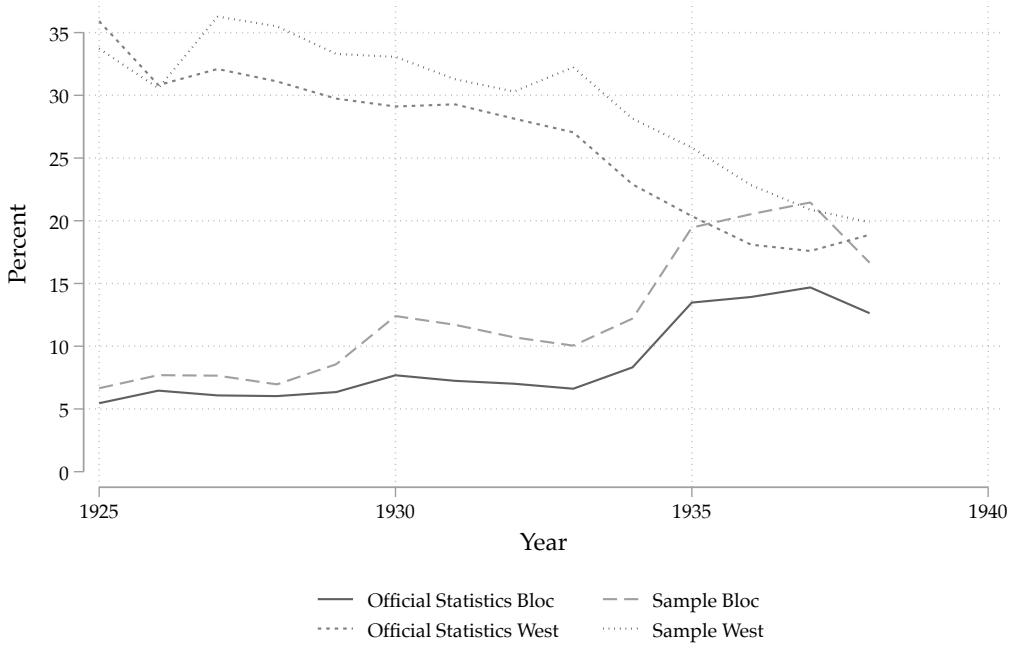
92. J. Tooze, *Statistics and the German State, 1900-1945: The Making of Modern Economic Knowledge* (Cambridge University Press, 2001).

93. This assessment does not apply to the earlier years of the Weimar Republic up to and including the hyperinflation years. According to Tooze ("Trouble with Numbers: Statistics, Politics, and History in the Construction of Weimar's Trade Balance, 1918–1924," 696), statistics from these early years were nothing "other than self-serving eyewash" even to the contemporaries in the Reich cabinet. Statistics for the years 1918 to 1923 suffer from "profound problems."

94. Tooze, *Statistics and the German State, 1900-1945: The Making of Modern Economic Knowledge*, 177.

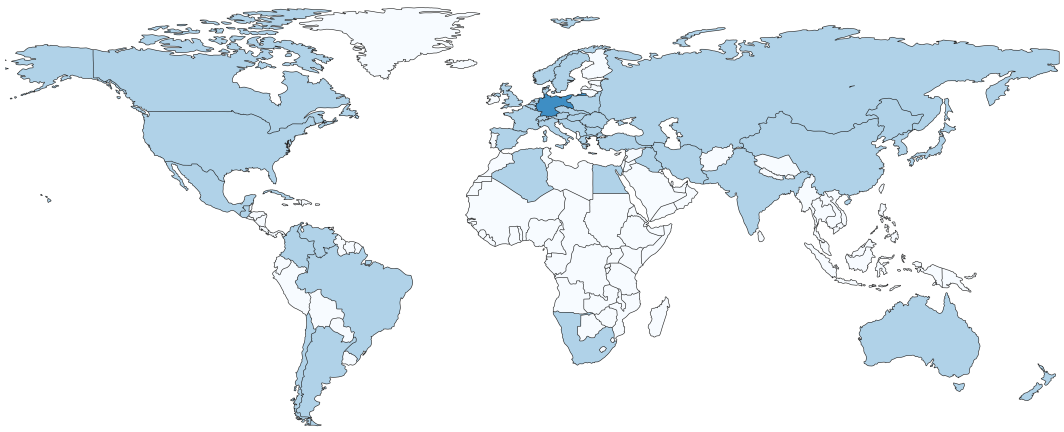
95. Hungerland, "On Germany and International Trade in the First Globalisation," 11.

Figure 4.19: Import share of the Reichsmark Bloc and major Western countries



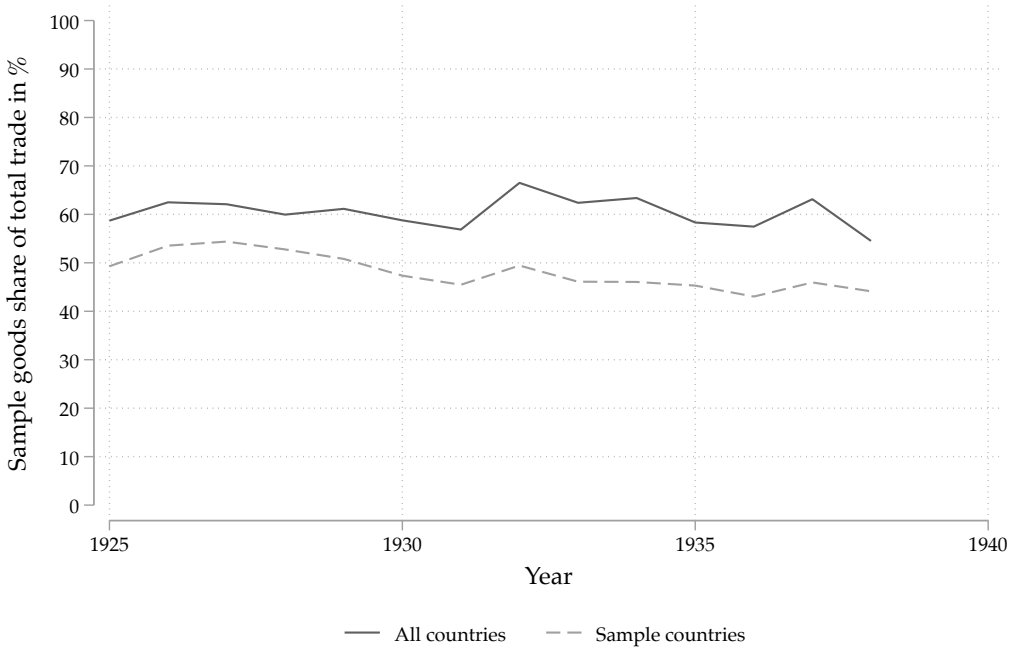
Note: The Reichsmark Bloc includes Austria, Brazil, Bulgaria, Greece, Hungary, Romania, Turkey, and Yugoslavia. The 'West' includes France, the UK, the Netherlands, and the United States. Source: Author's calculations based on Der Auswärtige Handel Deutschlands (1928-30), Monatliche Nachweise über den auswärtigen Handel (1931-38)

Figure 4.20: Trade partners in the sample



Shapefile source: see text.

Figure 4.21: Share of the commodities in the sample relative to total German imports for all countries and for the countries in the sample



Source: Author's calculations based on Der Auswärtige Handel Deutschlands (1928-30), Monatliche Nachweise über den auswärtigen Handel (1931-38)

The German Reich Statistical Office defined a good's country of origin as the place where the good was assembled in the form in which it was imported and the country of destination as the place where the good would ultimately be used.[96]

4.6 Intensive versus extensive margin

In the Great Trade Collapse of 2009, there was no notable decline on the extensive margin of trade.[97] The whole decline was driven by the intensive

96. See for instance *Monatliche Nachweise* 1938, p.5

97. M. Haddad et al., *Decomposing the Great Trade Collapse: Products, Prices, and Quantities in the 2008-2009 Crisis*, Working Paper, Working Paper Series 16253 (National Bureau of Economic Research, August 2010); A. A. Levchenko et al., "The Collapse of International Trade during the 2008–09 Crisis: In Search of the Smoking Gun," *IMF Economic Review* 58, no. 2 (December 1, 2010): 214–253.

margin. In the United Kingdom this was the same in the Great Depression: The number of varieties (particular goods imported from particular countries) that were imported fell by only 3 % between 1929 and 1933.[98] Is this also the case in Germany? The sample of the official trade statistics that I use suggest that – while also not the decisive factor – the extensive margin mattered more here. Out of this sample of goods, Germany imported 3,612 varieties in 1929, 3,701 in 1930, 3,271 in 1931, 3,063 in 1932, and 2,924 in 1933. That means a decrease of about 20 % from 1929 to 1933, most of which occurs between 1930 and 1931. On the export side, the number of varieties declines from 7,419 in 1929 to 6,662 in 1931 and then 5,946 in 1933, which is also a decline of about 20 %.[99]

It is possible that this decline is driven by changes in the German tariff code's categorization of goods. Some categories disappear from the lists after a few years and it is not always possible to determine with complete certainty, in which other category these have been subsumed. I therefore also look at the change in the number of varieties based on SITC categories, which means that I aggregate the data up to 43 categories of goods consistently defined over time. I find a decline in the traded varieties that is smaller but still not negligible: 784 varieties were imported in 1929 and 674 in 1933, that is a drop of 14 %. The number of export varieties, however, only decreased by 9 %, from 1,037 to 967. I also redo the exercise with just the goods that appear consistently from 1929 and 1933. The number of varieties traded out of this

98. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933," 14.

99. A decline in varieties could be due to a decline in the distinct categories of goods traded or due to a decline in the number of trading partners with a non-zero trade value. It could also occur with neither of the two broader categories declining if the country in question concentrates its purchases of specific goods in a smaller number of trading partners while maintaining trade in some goods with each country. In the case of Interwar Germany, the decline is almost entirely the result of such a concentration. Of the 50 trade partners in the sample, 47 had a non-zero value of imports in 1929, 46 in 1933. Of the SITC 3-digit categories in the sample, Germany imported 41 in 1929 and 41 in 1933. On the export side SITC categories traded also remained constant, while the number of export destinations with non-zero values declined from 48 to 45.

subsample decreased from 3,569 to 2,907 in this period, indicating that the previous results are not an artifact of the data structure.

De Bromhead et al. (2018) also calculate the log change at the intensive margin based on all varieties traded in both 1929 and 1933 (based on the method of Kehoe and Ruhl[100]). This decline in the UK, they find, can account for the entire decline in total trade. I apply the same method to Germany and find that the value of import varieties traded in both 1929 and 1933 declined by 1.10 log points. The decline in value for the whole sample was 1.26 log points. On the export side, the subsample of varieties traded in both years accounts for a decline of 1.06 log points, while the total value of exports declined by 1.13 log points. The German trade collapse in the Great Depression occurred mostly but, unlike the UK, not only at the intensive margin.

I now take a closer look at the extent to which I can observe a change in the extensive margin of trade as shown in the level of import diversification throughout the interwar period.[101] Hungerland has shown how import diversification gradually increased in Germany during the Wilhelmine era, based on a falling Herfindahl index, a widely used measure of market concentration.[102] [103] More diverse imports, he suggests, "mean less dependence on single suppliers, which moderates business cycle fluctuations."[104] I can calculate the same measure for the interwar period based on the formula

$$H_t = \sum \left(\frac{v_{ikt}}{\sum v_{ikt}} \right)^2, \tag{4.1}$$

100. T. J. Kehoe and K. J. Ruhl, "How important is the new goods margin in international trade?," *Journal of Political Economy* 121, no. 2 (2013): 358–392.

101. This measure allows me to look at trade concentration with a different metric than comparing the change in the number of varieties traded directly. If trade declined at the extensive margin in the Great Depression, we should see a higher concentration of German imports among a smaller group of trading partners.

102. Hungerland, "On Germany and International Trade in the First Globalisation," 34.

103. For more information on the Herfindahl index, see Rhoades ("The Herfindahl-Hirschman index")

104. see also Calderon et al. ("Trade intensity and business cycle synchronization: Are developing countries any different?")

where H_t is the Herfindahl index for year t and v_{ikt} is the value of trade with country i in SITC category k in year t.

Graph 4.22 shows that the Herfindahl index was generally falling throughout the interwar period but spiked at the height of the Great Depression. This suggests that the expansion of trade at the extensive margin that was ongoing in Germany for decades before World War I (see also, for instance, Hungerland and Wolf[105]) and continued in the 1920s, came to a marked halt in the early 1930s and trade became more concentrated in a smaller number of varieties. However, this momentary decrease at the extensive margin was dwarfed by the much larger decrease at the intensive margin during the crisis years.

Figure 4.22: Herfindahl index of German import varieties

Note: The dashed line shows a fitted trend. Author's calculations based on data from *Monatliche Nachweise*.

105. W.-F. Hungerland and N. Wolf, "The Panopticon of Germany's Foreign Trade, 1880-1913. New Facts on the First Globalization," *CEPR Discussion Paper*, no. DP15988 (2021).

4.7 Disaggregating the Trade Collapse

Which categories of goods were particularly affected by the trade collapse in the Great Depression? If the results of Levchenko et al. and de Bromhead et al. are indicative of the structure of trade collapses more generally, compositional effects are crucial in explaining disproportionate declines in trade during recessions. I should then see something similar in Germany. Furthermore, Levchenko et al.'s argument that vertical linkages matter suggests that trade in intermediate goods should be particularly affected. Levchenko et al.[106] divide the goods traded during the Great Trade Collapse into ten groups: food, durable industrial goods, non-durable industrial goods, durable consumer goods, non-durable consumer goods, fuel, automotive vehicles, aircraft, computers, and other capital goods. De Bromhead et al.[107] follow their example, but exclude computers, since these were practically non-existent in the interwar period. Levchenko et al.[108] find that in 2009, "for both U.S. exports and imports, the sharpest percentage drops are in the automotive and industrial supplies sectors, with consumer goods trade experiencing a far smaller percentage decrease. For imports, the decrease in the petroleum category alone accounts for one third of the total decline." De Bromhead et al. compare these results to interwar Britain and find that "the composition of the 2008-2009 American, and 1929-31 UK, trade collapses was strikingly similar", but that the further decline in trade between 1931 and 1933 followed a very different pattern. Figure 4.23 plots the relative decline in German imports and exports of the nine categories for these two periods – 1929 to 1931 and 1931 to 1933 – against the decline in the 2009 crisis in the United States based on the data from Levchenko et al.[109] For this, I have transcribed

106. Levchenko et al., "The Collapse of International Trade during the 2008–09 Crisis: In Search of the Smoking Gun."
107. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933."
108. Levchenko et al., "The Collapse of International Trade during the 2008–09 Crisis: In Search of the Smoking Gun."
109. Ibid.

import and export values for all goods traded in 1929, 1931 and 1933 from the trade volumes of the Reich Statistical Office.[110] There are 2,077 import and 1,901 export categories in 1929 and almost all of these categories remain consistent throughout the four years. For each of these categories, I determine which of the nine categories they belong to based on the classification of the Bureau of Economic Analysis.[111]

A similar pattern to that of the UK emerges, but with some distinct differences. Just as in the case of interwar Britain, the decline in imports and exports from 1929 to 1931 is positively correlated with that of the same categories in 2009. Industrial goods were hit much harder than consumer goods in both 1929 and 2009. This is true of both imports and exports. Capital goods were also affected more. Some categories, however, behaved very differently in interwar Germany. Car exports only fell by 9.8 % between 1929 and 1931 while they were one of the most severely affected categories in 2009, falling by 47 %. Food exports on the other hand only fell by 19 % in 2009, but by more than 50 % in the first two years of the Depression, making it the category with the biggest decline by far. On the import side, both automotive vehicles and aircraft were the most affected by the trade collapse, with declines of over 70 % each. This is similar, though more severe, to the pattern in the United Kingdom.

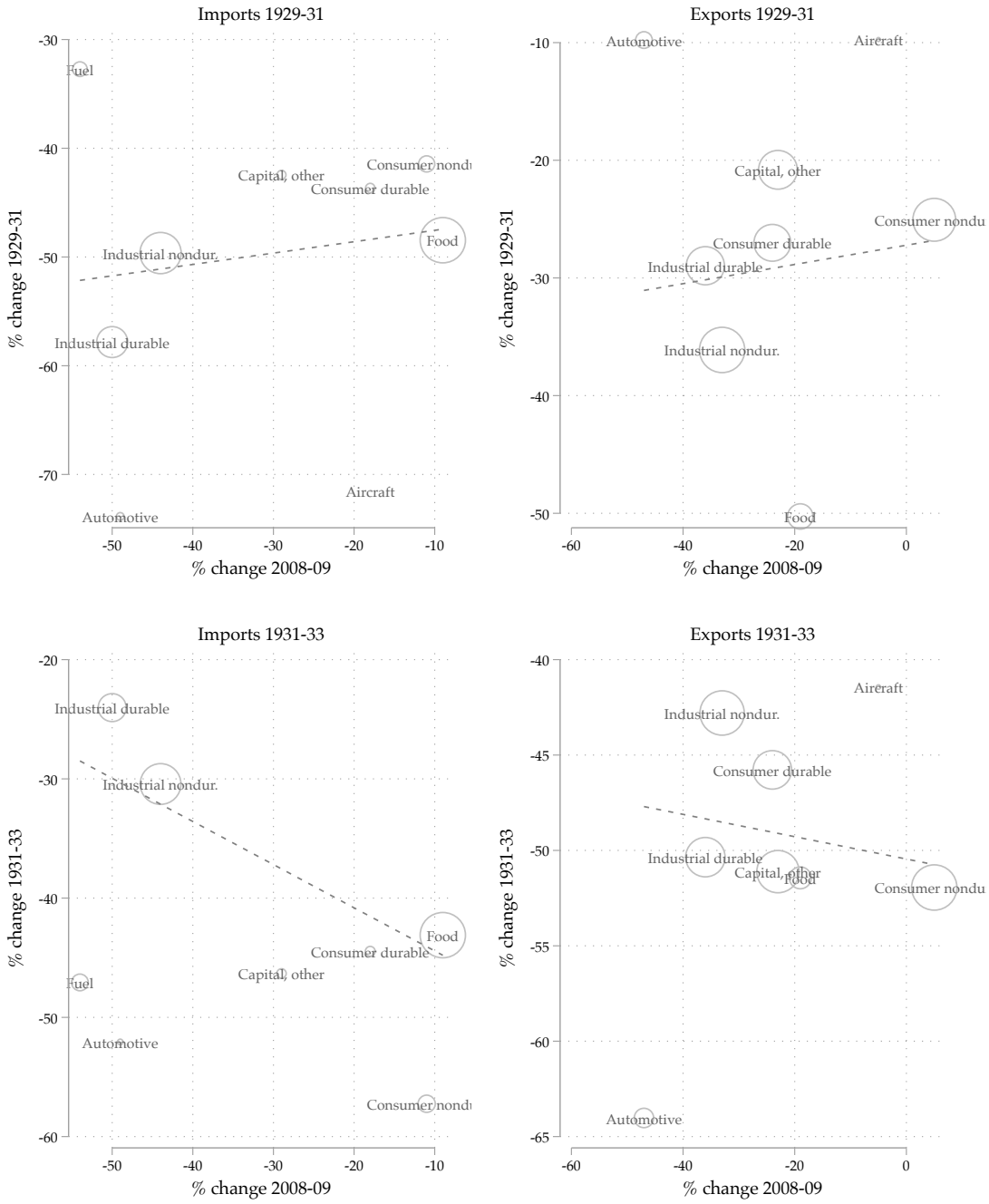
The correlation then gets turned on its head between 1931 and 1933 in both Germany and the UK.[112] Unlike in 2009, nondurable industrial goods were far less affected by the trade collapse than nondurable consumer goods

110. Statistisches Reichsamt, *Der Auswärtige Handel Deutschlands im Jahr 1929* (Reimar Hobbing, 1930); Statistisches Reichsamt, *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1931* (Reimar Hobbing, 1932); Statistisches Reichsamt, *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1933* (Reimar Hobbing, 1934).

111. Bureau of Economic Analysis, *Concepts and Methods of the U.S. National Income and Product Accounts* (Washington, D.C.: U.S. Department of Commerce, 2016).

112. I exclude the aircraft category on the import side here, because while this is a very small category it was the only one that experienced an increase in imports of 247 % making it a big outlier that would distort the scale of the graph. The traded value of aircraft is so small that it does not meaningfully change the weighted fitted line. The fact that aircraft imports increase in the second period is in line with the UK findings of de Bromhead et al., though.

Figure 4.23: The trade collapse by category



between 1931 and 1933, with the latter becoming one of the categories with the biggest decline (similar to what happened in Britain at the same time). Other capital goods were also now hit very severely at 46 % for imports

and 51 % for exports. The decline in trade of automotive vehicles, on the other hand, was in line with the 2009 crisis, with both imports and exports going through a decline of more than 50 %. Food imports, unlike in 2009, kept declining very severely. On the export side, automobiles moved from being one of the least affected categories in the 1929-31 period to being by far the worst affected one. On the import side the same happened for fuel. This is the opposite of what happened in Britain where automotive exports and fuel imports were both hit harder up to 1929 and then actually increased in the second half. These differences may point to the fact that Britain began to recover from the Great Depression after leaving the Gold Standard in September 1931, while Germany slid much deeper into crisis after the banking crisis of that year and the introduction of exchange controls. The decline of consumer goods imports in both countries could be the result of the rise of protectionism in both countries. The severe decline in food exports especially in the first half of the Depression, cannot primarily be the result of a reduction in domestic output as food production contracted far less than manufacturing (see Hoffmann:[113] grain production, for example, only declined by 6.5 % between 1929 and 1933, compared to a decline in industrial production of 31.5 %). Domestic production in conjunction with export reduction thus partially compensated for the enormous shortfall in food imports as a result of rising agricultural tariffs.

Additional graphs in the appendix show that these patterns are not the result of the chosen start and end dates: the findings also hold if we include the entire period of decline (1927-1933 for imports, 1929-1934 for exports).

113. Hoffmann, *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, 385,393.

4.8 The Geography of Trade in the Great Depression

4.8.1 Trade by continents

The GTC in 2008/09 was geographically well-balanced: trade fell by similar amounts across world regions at the same time. The decline of British trade during the Great Depression was also initially well-balanced between Empire and non-Empire trade partners, but then, due to preferential trade policy, became unbalanced after the Ottawa Conference. Can we find a similar pattern in Germany? How did the trade collapse differ by geographic region and product category? To answer this question, I classify all products in the sample into food, colonial goods, raw materials and finished manufactured goods and divide all trade partners by continent. I calculate the change in value for each of these categories. Figures 4.24 and 4.25 show that there are big differences across continents in the timing, composition and magnitude of the collapse.[114] Imports from the Americas fell by 65 % between 1929 and 1931, the sharpest decline in this period, then by a further 29 % by 1933. The decline of imports from Africa and Oceania is almost entirely contained within the first two years with only a 4.5 and 2.6 % decline in the second half of the Great Depression. Raw material imports from Africa and Oceania and manufactures imports from the latter were already increasing again between 1931 and 1933. In Africa agricultural and colonial wares were hit harder than raw materials. African manufactures were the only category increasing in the first period, but only accounted for a tiny fraction of total trade. Imports from the relatively close European countries fell the least in the first two years (45.8 %) but then fell by a similar, even slightly higher, percentage (47.3 %) again in 1931-33, suggesting that long distance trade was hit by the crisis first, but that the decline in short-distance trade caught up later.

114. The precise values for each category are listed in the appendix.

On the export side, the more long-distance trade with Oceania and the Americas also took the hardest hit early on. Exports to the Americas decreased by 61 % between 1929 and 1931, then by a further 49 % until 1933. Trade declined in almost all categories with the exception of the very small export volumes of agricultural goods to Africa and raw materials to Asia in the second half of the period.

Agricultural exports were affected particularly strongly in the first half of the Great Depression, especially those to Africa and the Americas where the value of German exports declined by staggering 94 and 80 %, respectively. Manufacturing, Germany's most important export category at almost two thirds of the total value in 1929, declined by far less, especially in Europe where the drop was about 14 %. This changed in the second half of the period, when manufacturing exports to Europe declined by 54.45 %, more than agricultural and raw material exports within the continent. In exports to the Americas and Asia, agricultural exports remained the category that was the most affected by the trade collapse in the latter half of the Depression.

Unlike the Great Trade Collapse of 2008-09 and the first phase of the Great Depression in Britain (pre-Ottawa), the interwar trade decline in Germany was not geographically balanced. There were large differences with regards to the timing, magnitude and composition between world regions.

Figure 4.24: The Trade Collapse in Imports by Geographical Disaggregation

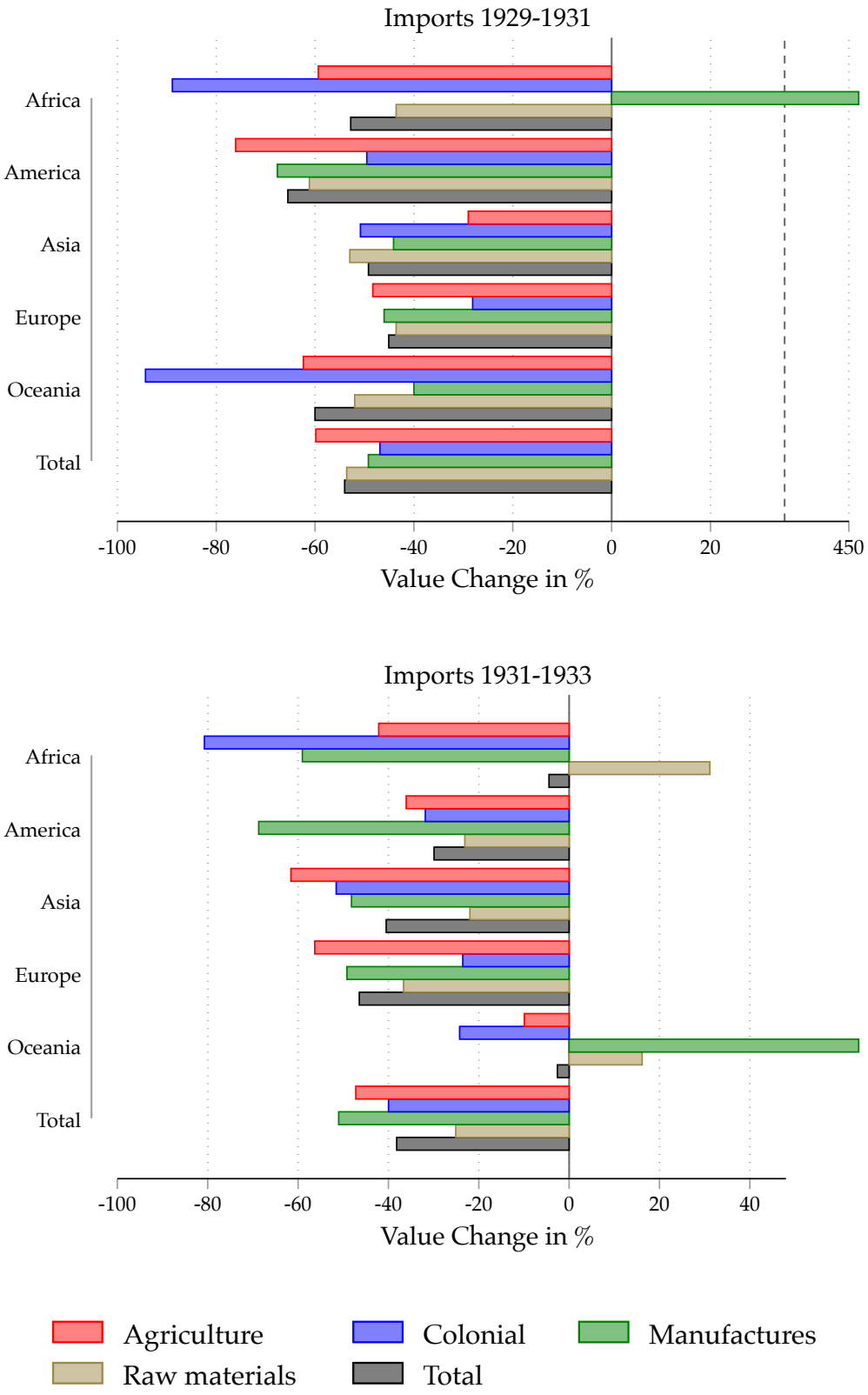
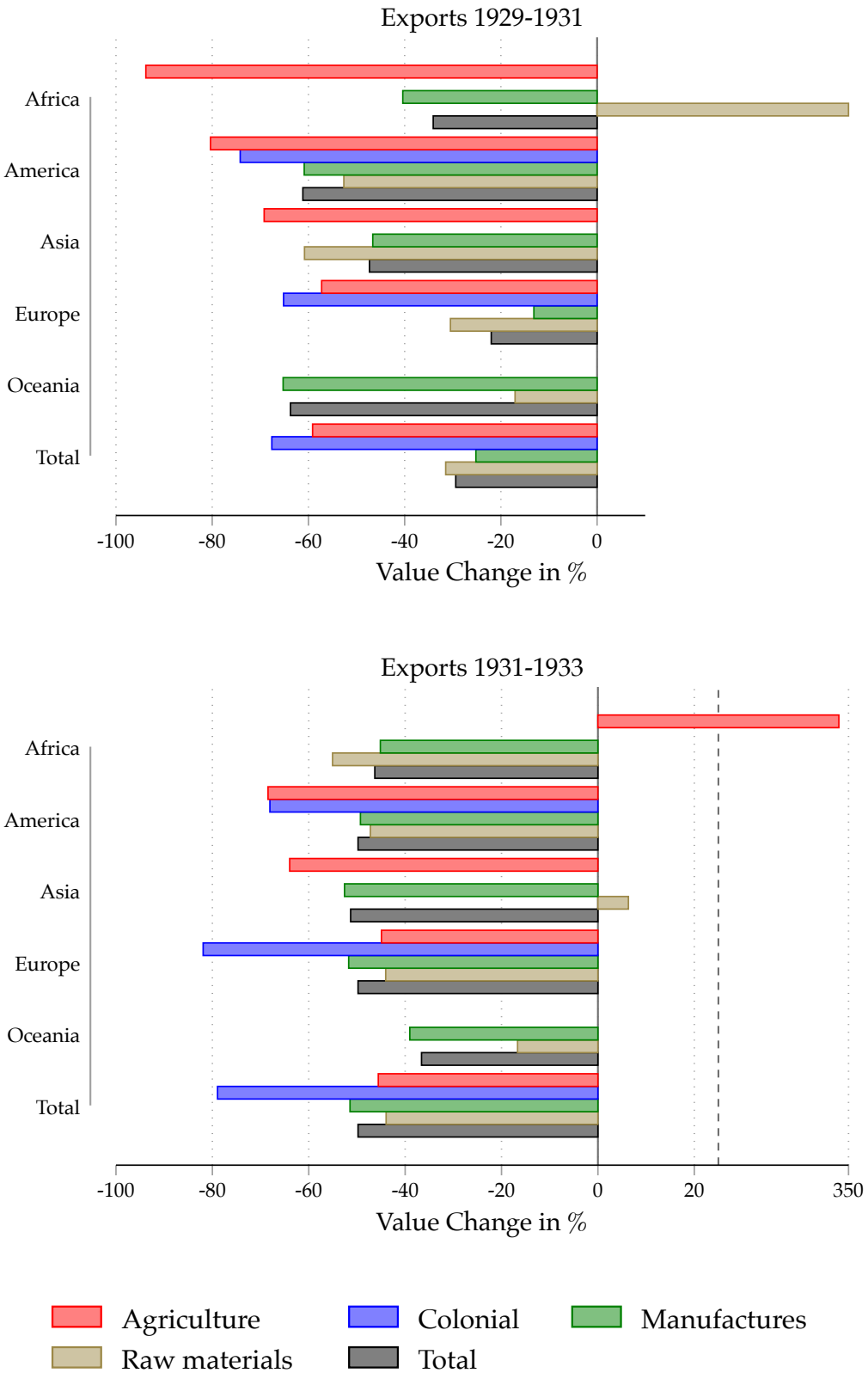


Figure 4.25: The Trade Collapse in Exports by Geographical Disaggregation



4.8.2 The Reichsmark Bloc at work

The emergence of trade blocs was one of the defining features of interwar trade policy. The United Kingdom turned towards its Empire and gave its colonies preferential tariffs. Germany, on the other hand, intensified its trade with six countries in Southeastern Europe – Turkey, Romania, Yugoslavia, Bulgaria, Greece, and Hungary – as well as Latin America, notably Brazil.[115] I also consider Austria to be a member of the trade bloc, as is common practice in the economic history literature (for instance, Madsen, Eichengreen and Irwin, and Adam[116]). Was trade with these countries affected differently than that with the rest of Europe?

Unlike the Empire in Britain, the Reichsmark Bloc actually only accounted for a small share of total German trade – and a substantial increase in its share did not occur until the Nazi period. The bloc's share of German imports rose from 7.5 % in 1929 to 8.6 % in 1933 while its share of exports fell from 9.7 % to 8.0 %. By 1937 the bloc accounted for 17.4 % of German imports and 16.4 % of exports.[117]

In tables 4.2 and 4.3 I compare the eight bloc countries as defined above to the rest of the countries in the sample at a more disaggregate level. Total trade with the bloc in the sample of goods declined much less between 1929 and 1931 than with the rest of the world. This is not the result of any category of goods in particular as imports of manufactures, raw materials, agricultural goods, and colonial goods all declined significantly less than trade with other countries. However, in the second half of the Depression, from 1931 to 1933, imports from the Reichsmark Bloc fell by a lot more than from the rest of the world. Agricultural imports from the bloc fell by 44.5 % in the first two

115. see, for instance, Milward ("The Reichsmark Bloc and the International Economy") and Gross (*Export Empire: German Soft Power in Southeastern Europe, 1890–1945*)

116. Madsen, "Trade barriers and the collapse of world trade during the Great Depression"; Eichengreen and Irwin, "Trade blocs, currency blocs and the reorientation of world trade in the 1930s"; Adam, *Return of the tariffs: The interwar trade collapse revisited*.

117. Author's calculations based on the German statistical yearbooks with the Reichsmark Bloc defined as the eight countries listed above.

years, then by a further 70.1 % in the second period, compared to a drop of 61.3 and 44.1 % in imports from the rest of Europe. This might be the consequence of the tariffs introduced in April 1930. Wheat, barley and eggs constituted a large share of the agricultural imports from these countries before the Great Depression, three commodities that were hit by particularly severe tariffs in 1930. Germany imported 100 million RM worth of barley from Romania alone in 1929 (out of a total import value from Romania of 211 million RM), and 12 million RM worth of eggs from Yugoslavia (out of a total of 61 Million (see Statistisches Reichsamt[118]). Tariffs on barley rose from 5 to 10 RM per 100 kilogram in April 1930, then reached 18 RM by the end of that year. Eggs had been tariff-free until April 1930, then were hit with a rate of 30 RM per 100 kg, equivalent to a 17 % ad valorem equivalent rate for the Yugoslavian imports.[119]

Exports to the Reichsmark Bloc fell by a lot more than exports to the rest of the world in both periods, first by 42.5 % compared to 18.1 %, then by 56.7 % compared to 49.7 %. Agricultural exports fell by 66.6 % at first, then by a further 33.5 %, compared to a 56.3 and 45.6 % decline for the rest of the world. Manufacturing exports to bloc members were hit particularly hard in comparison to other countries in the first two years: exports of these to the bloc declined by more than 40 % compared to 7 % in exports to other countries.

What happened once exchange controls were in place and Germany's trade policy had become more rigid? Between 1931 and 1933 imports from the Reichsmark bloc actually fell more than those from the rest of Europe, mostly as a result of a severe collapse of agricultural imports. Colonial goods were the only category that was less affected,[120] while raw materials and manufactures imports also saw disproportionate declines in trade values. While this shift to the detriment of the Reichsmark bloc coincided with the major paradigm

118. Statistisches Reichsamt, *Statistisches Jahrbuch für das Deutsche Reich* (1930).
119. Ibid.
120. This primarily includes tobacco and tea as well as small amounts of oilseeds and coffee.

shift in trade policy, it pre-dates the widespread use of discriminatory trade policy instruments which mostly resulted from new trade treaties in the mid-1930s. This, along with the less severe collapse in Reichsmark bloc trade during the earlier period before tariffs became prohibitive, suggests that trade with the bloc was depressed by disproportionally high tariffs for its most important products.

Table 4.2: Change in Reichsmark Bloc Exports Compared to Other Exports

Category	Region	Share 1929	% Change 1929-31	% Change 1931-33
Agriculture	Reichsmark Bloc	0.04	-66.60	-33.50
Agriculture	Other countries	0.07	-56.26	-45.61
Agriculture	Total	0.06	-56.99	-44.95
Colonial	Reichsmark Bloc	0.01	-47.27	-45.96
Colonial	Other countries	0.02	-65.69	-84.04
Colonial	Total	0.02	-65.06	-82.08
Manufactures	Reichsmark Bloc	0.71	-40.36	-63.21
Manufactures	Other countries	0.62	-7.28	-51.43
Manufactures	Total	0.62	-11.10	-52.34
Raw materials	Reichsmark Bloc	0.24	-44.35	-39.12
Raw materials	Other countries	0.30	-29.05	-44.68
Raw materials	Total	0.29	-30.34	-44.30
Total	Reichsmark Bloc	1.00	-42.52	-56.69
Total	Other countries	1.00	-18.11	-49.71
Total	Total	1.00	-20.60	-50.23

4.9 Price changes in the Great Depression

The German statistical volumes list trade both by weight and by value, allowing me to construct unit values for each good. Gopinath et al.[121] show that in the 2008-09 crisis, a large price decline of 17 % only occurred among non-differentiated goods, while differentiated goods prices barely changed

121. G. Gopinath et al., "Trade prices and the global trade collapse of 2008–09," *IMF Economic Review* 60, no. 3 (2012): 303–328.

Table 4.3: Change in Reichsmark Bloc Imports Compared to Other Imports

Category	Region	Share 1929	% Change 1929-31	% Change 1931-33
Agriculture	Reichsmark Bloc	0.33	-44.45	-70.12
Agriculture	Other countries	0.32	-61.32	-44.06
Agriculture	Total	0.32	-59.84	-47.22
Colonial	Reichsmark Bloc	0.43	-34.73	-31.92
Colonial	Other countries	0.09	-52.69	-45.30
Colonial	Total	0.12	-46.88	-39.98
Manufactures	Reichsmark Bloc	0.07	-34.39	-52.87
Manufactures	Other countries	0.16	-49.84	-50.92
Manufactures	Total	0.15	-49.22	-51.02
Raw materials	Reichsmark Bloc	0.17	-36.81	-38.00
Raw materials	Other countries	0.43	-54.27	-24.42
Raw materials	Total	0.41	-53.64	-25.10
Total	Reichsmark Bloc	1.00	-38.25	-45.84
Total	Other countries	1.00	-55.71	-36.70
Total	Total	1.00	-54.19	-37.77

with a 1 % decline. They also find that the "only categories that experienced large declines in prices were nonmanufactures, consumer nondurables, and durable intermediates, presumably sectors that include a lot of commodities or goods with large commodity content."[122] De Bromhead et al.[123] show that in the Great Depression in Britain, while non-differentiated goods prices fell by a similar margin as in 2009, differentiated goods prices also fell, albeit by a smaller margin of 9-10 %. I therefore examine if this is a phenomenon that is true of the Great Depression more generally by applying their methodology to the German data.

I use data on trade volumes in weight and values in Reichsmark for 2,374 categories of goods from the same sources used before. I then construct time series of unit values as the ratio of value over volume for all goods with consistent classification over time and calculate the log change from

122. Gopinath et al., "Trade prices and the global trade collapse of 2008–09," 304.
123. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933."

one time period to the next. Just like Gopinath et al.[124] and de Bromhead et al.,[125] I exclude those series that change by more than two log points to avoid excessive volatility in the data. This leaves me with 1,805 import categories and 1,252 export categories.

I then calculate the log changes in unit values between 1929 and 1931, and between 1931 and 1933. Table 4.4 shows the median values of these log changes. I first split up the sample into differentiated and non-differentiated goods (based on the classification of Rauch[126]) and then further disaggregate the goods into manufactures and non-manufactures, durable and non-durable, and (in the appendix) capital, intermediary, and consumption goods.

Table 4.4: Unit value changes by goods category

	1929-31					
	Exports			Imports		
	All	Non-diff.	Diff.	All	Non-diff.	Diff.
All goods	9.0	-0.2	15.6	-16.3	-21.5	-12.1
Non-manufactures	2.9	3.3	-14.7	-25.7	-24.6	-30.9
Non-durable manufactures	-0.3	-14.4	5.4	-18.1	-11.0	-20.9
Durable manufactures	20.9	21.5	20.9	-6.1	-21.5	-5.0
	1931-33					
	Exports			Imports		
	All	Non-diff.	Diff.	All	Non-diff.	Diff.
All goods	-21.3	-34.9	-14.1	-27.6	-33.0	-23.3
Non-manufactures	-42.0	-41.2	-50.3	-34.8	-34.3	-41.1
Non-durable manufactures	-16.2	-26.0	-10.9	-28.4	-29.2	-28.4
Durable manufactures	-14.6	-33.3	-14.1	-18.4	-30.3	-17.2

First of all, the median unit value of imports was falling in both sub-periods while the median unit value of exports only fell between 1931 and 1933. The prices of non-differentiated goods prices did indeed fall much more severely than those of differentiated goods. This is true for both imports and

124. Gopinath et al., "Trade prices and the global trade collapse of 2008–09."
125. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933."
126. J. E. Rauch, "Networks versus markets in international trade," *Journal of international Economics* 48, no. 1 (1999): 7–35.

exports and for both periods examined (1929-1931 and 1931-1933). On the import side, non-differentiated goods prices fell by 21.5 % between 1929 and 1931 and by a further 33.0 % between 1931 and 1933. Differentiated goods prices on the other hand fell by only 12.1 % in the first period and by 23.3 % in the second. This is still a very substantial price collapse compared to the 1.1 % drop in the Great Recession and even the British interwar price drop, which amounted to 9.1 and 5.9 % in the two periods, respectively. Export prices were still rising in Germany for differentiated goods between 1929 and 1931, but were already declining slightly (by 0.2 %) for non-differentiated goods. Between 1931 and 1933, the drop was also much bigger for non-differentiated goods at 34.9 % compared to 14.1 % for differentiated goods. Again, in the second period this price drop was much larger than in the United Kingdom, where export prices declined by 5.1 % in non-differentiated goods and 9.7 % in differentiated goods.[127]

I can further break down these results based on durability and end use. In the 2008/09 crisis, the price decline was mostly driven by non-manufactures and durable manufactures, with nondurable manufactures declining by much less.[128] The interwar period shows a more mixed picture. Non-manufactures were a major driving force behind the decline in import prices in both sub-periods of the Great Depression while durable manufactures were consistently the least affected for both imports and exports.

In the United Kingdom, prices of differentiated durable manufactured goods barely fell in this period. Was this also true in Germany? The results presented here suggests that it was, but only on the export side. Differentiated durable manufactures were consistently the category of goods least affected by the price decline, and with a 20.9 % increase, they were an important contributing factor in the overall price rise in exports during the first half of the examined period. This initial price rise was followed by a decline of a

127. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933."
128. Gopinath et al., "Trade prices and the global trade collapse of 2008–09," 314.

similar magnitude at 14.1 %, which adds up to a small price increase in total. But on the import sides prices fell by 5 % between 1929 and 1931 and then a further 17.2 % from 1931 to 1933. All in all, de Bromhead et al.'s finding needs to be qualified a bit in the case of Germany: We can say that, just like in the GTC, prices of differentiated durable manufactures fell a lot *less* than those of other goods, but the magnitude of the price collapse means that we cannot conclude that, as in the UK, prices fell barely at all.

De Bromhead et al.[129] furthermore find that in Britain, the difference between non-differentiated and differentiated goods among durable manufactures was large between 1929 and 1931, whereas among other goods, prices declined by a very similar margin regardless of differentiation. This is very similar in Germany on the import side. Differentiated durable manufactures import prices only declined by 5.0 % while the non-differentiated ones declined by 21.5 %. In the other categories, differentiated goods prices actually declined by *more* than the non-differentiated ones and the margin between the two values is much closer. For non-manufactures this also holds for the 1931-33 period and for both imports and exports.

The variety-level data allow me to also investigate geographical differences in unit value changes. I do this by constructing median log changes in the same manner as for the good level data above. Price declines varied significantly between different world regions. As figures 4.26 and 4.27 show, unit values dropped by double digit percentages for imports and exports from and to all continents and in both periods examined, but European imports were far less affected than those from other parts of the world between 1929 and 1931. Import prices for European goods fell by 27 % in the median, those for African, American and Asian goods by more than 40 % and those for Oceanian goods even by more than 70 %. This was mostly driven by the comparatively low

129. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933."

price decline of European manufactures of 17 %.[130] Large price declines in imports from other continents in this period occurred primarily in agricultural goods and raw materials. Raw material unit values declined by 81 % for African imports, 60 % for American and 61 % for Asian ones. In the 1931-33 period European import prices still declined by less than those of other continents but the difference was smaller. American and Oceanian import prices declined by not much more, at 38 %, than the European ones at 36 %.

The export side looks different: At 46 %, exports to Europe saw the biggest price decline compared to other continents in the 1929-31 period. Prices of goods exported to Africa, Asia, Oceania merely declined by 11 to 12 %. Only the Americas showed a similar price decline to that of Europe, at 42 %. In the second half of the Great Depression, however, this relationship was turned on its head and the export price decline for Europe was the smallest at 27 %, albeit at a very similar magnitude to the other continents except Oceania.[131]

4.10 Conclusion

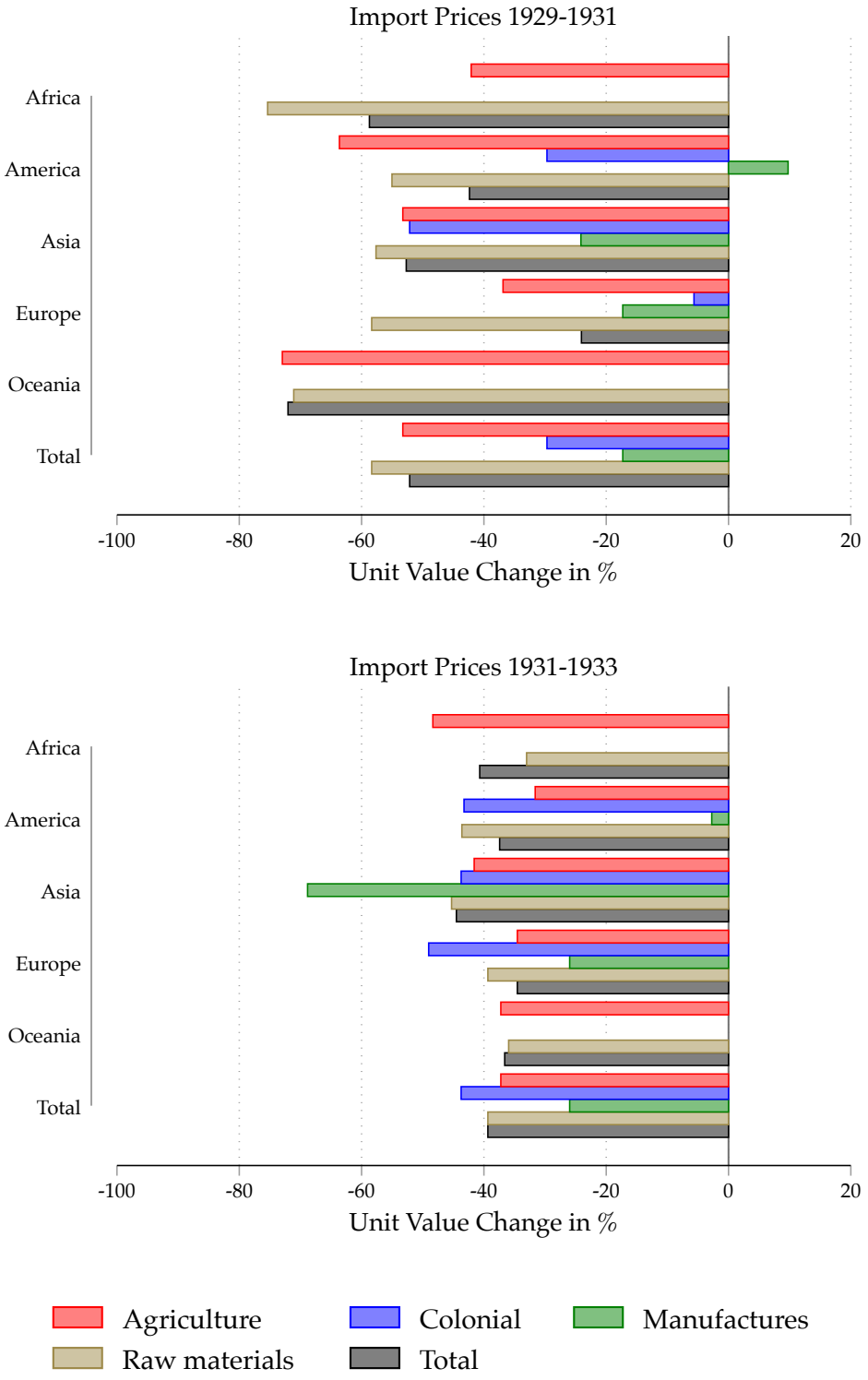
The trade collapse during the Great Depression in Germany was longer and more severe than that during the Great Recession. It was also more severe than that experienced by the United Kingdom in the Great Depression. Generally the results of this chapter show that various of the stylised facts that de Bromhead et al. summarise for the 2008/09 Great Recession[132] also hold up during the Great Depression in Germany, while others do not. First of all, there was a major increase in protectionism in 1930s Germany while most of the literature agrees there was no noteworthy protectionist shift during the GTC. Unlike the GTC, the trade collapse of 1929-33 increasingly

130. Prices of European colonial goods also barely declined but only accounted for a small fraction of total imports.

131. All exact values from this bar chart are also listed in the appendix.

132. de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933."

Figure 4.26: Unit Value Changes in Imports by Geographical Disaggregation



occurred under a trade policy regime of harsh protectionism in the form of extremely high tariffs, exchange controls, and clearance agreements.

This difference is partially explained by the differences in the international monetary systems with the interwar politicians' ability to maintain free trade severely restricted by the gold standard and beggar-my-neighbor effects.[133] However, as the previous chapter has shown, special interests played an outsized role as well. In the following chapter, I will show that trade policy was indeed responsible for a large decline in consumer goods, fuel, and food imports.

Secondly, the Great Depression led to an even more severe price collapse but one that was not synchronized across different regions and varieties. This price collapse is also tightly entangled with the increase in protectionism. As I will show in chapter 6, the decline in global commodity prices accounted for a large share of the increase in ad valorem tariff rates since tariffs were set in weight-specific terms. Thirdly, price declines mattered much more for the decline in value in 1930s Germany than in the 2009 crisis. Fourthly, the German interwar trade collapse also took place primarily at the intensive margin (although a minor decline on the extensive margin did happen too) and fifthly, the goods that were hit the most are similar to those in the United States during the GTC and the UK in 1929-31. Industrial goods imports and exports fell more than consumer goods imports and exports in this time, lending further support to the hypothesis that compositional effects and vertical linkages play an important role in big trade collapses.

After 1931, similar to the UK, the pattern of goods affected was inverted, though food trade declined sharply in both periods (but not in the 2009 crisis). Since Germany's Depression was still getting worse at this point, a possible explanation for this inversion is the sharp increase in protectionism in 1931.

133. Eichengreen and Irwin, "The slide to protectionism in the Great Depression: Who succumbed and why?"; T. N. H. Albers, "Currency devaluations and beggar-my-neighbour penalties: evidence from the 1930s," *The Economic History Review* 73, no. 1 (2020): 233–257.

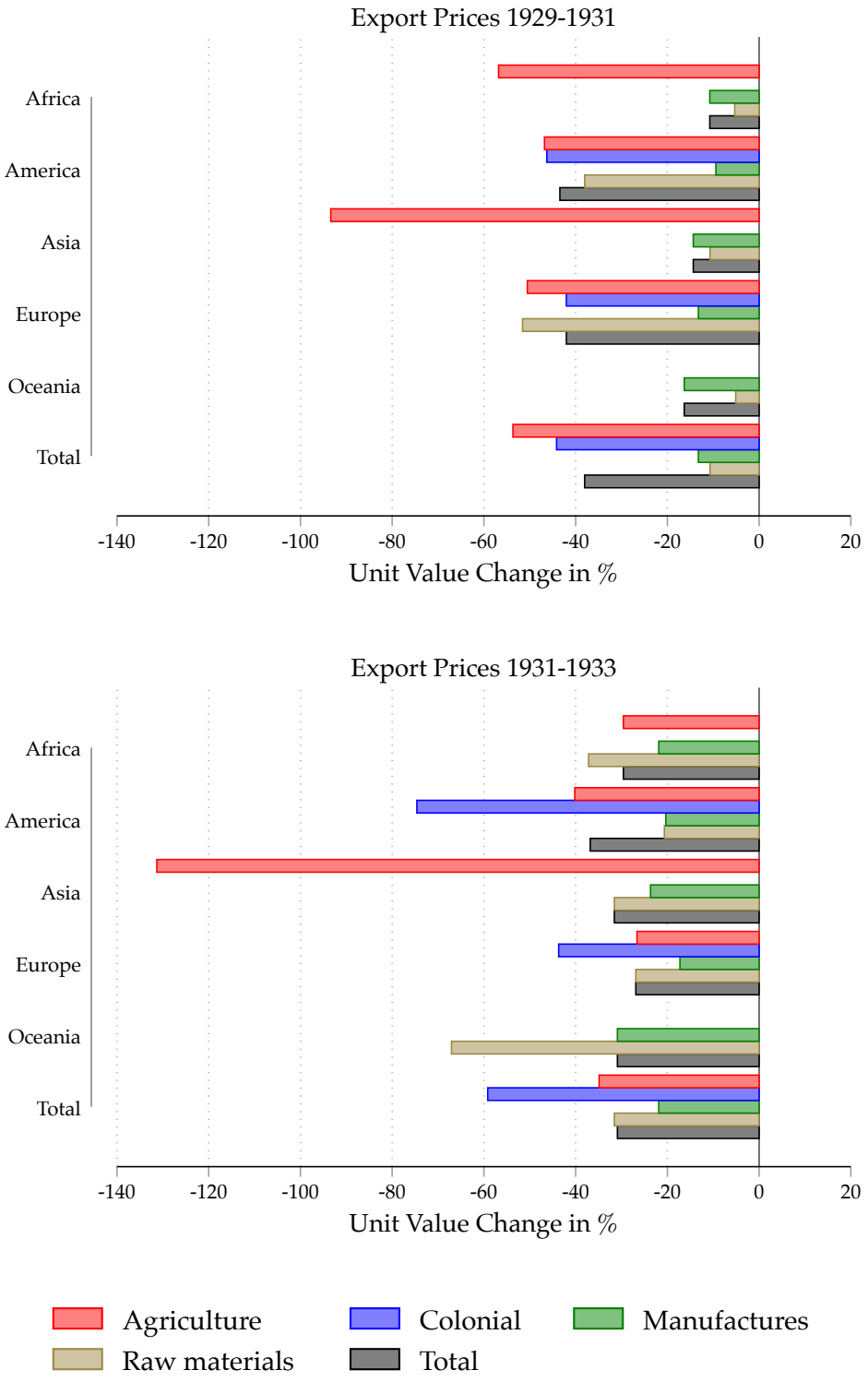
Trade in automobiles was one of the hardest hit sectors both in the GTC and in interwar Germany. The results are ambiguous on the question of whether durable goods trade fell more than non-durable goods trade.

The sixth stylized fact about the GTC is that prices of non-differentiated goods declined by a lot more than those of differentiated goods. The data show that this is the case for interwar Germany as well. Differentiated goods prices fell less than non-differentiated goods in both crises.

Finally, the pattern of trade was geographically less balanced than in the GTC. Trade with the countries of what would become the Reichsmark bloc was affected less in the first two years of the Depression, but then was hit more severely in the second half of the examined period. The stronger relative decline after 1931 seems to be due to the introduction of high tariffs on agricultural goods in 1930 and 1931, which made up a large share of these predominantly agrarian economies. It remains to be analysed to what extent trade policy contributed to the eventual shift towards trade with these countries.

This chapter provides evidence on the trade collapse in the Great Depression for a second major interwar economy following previous work on the UK by de Bromhead et al. It remains for future research into other countries to show whether the similarities hold up elsewhere and – where the two case studies diverge – which of the two is more representative of the general experience in the Great Depression and in trade collapses more broadly.

Figure 4.27: Unit Value Changes in Exports by Geographical Disaggregation



5

Effective Protection in the German Interwar Economy

5.1 Introduction

Between the start of the Great Depression and the mid-1930s, Germany became one of the most protectionist economies in the world[1] with tariffs sky-rocketing especially in the agricultural sector, following the demands of lobbying organizations suffering from globally falling prices.[2] The narrative of this paradigm shift in trade policy mostly describes a dichotomy between agriculture and heavy industry as the beneficiaries of protectionism and the modern export industries – electronics, precision mechanics, chemicals – as

1. Eichengreen and Irwin, "The slide to protectionism in the Great Depression: Who succumbed and why?"

2. D. Gessner, "Agrarian Protectionism in the Weimar Republic," *Journal of Contemporary History* 12, no. 4 (1977): 759–778.

proponents of free trade (see, for instance, Stegmann[3] for a good summary). However, little attention has been paid in the literature to the role of effective protection and its impact on Germany's economy. Since the agricultural sector uses many agricultural goods as inputs – such as the use of grain as fodder in livestock production – rising tariffs on these inputs might offset the advantages the sector gained on the output side. Does agriculture stand out as the predominant sector of protection even under these considerations? Recent research into the input-output structure of the German interwar economy by Fremdling and Stäglin[4] now make it possible to take a more in-depth look at this aspect of the German protectionist turn.

In order to analyze effective protection, I have digitized tariff revenues at the disaggregation level of the German tariff classification system for the universe of German imports in 1929, 1932, and 1936. I then calculated ad valorem equivalent tariff rates based on the trade data listed separately in the same publication in and assigned each good in the trade data to one of the 30 traded goods sectors in Fremdling and Stäglin's input-output table for 1936 Germany. I then calculated an average nominal tariff rate for each sector and, based on those, constructed effective rates of protection for the three years, first following the conventional approach and then making adjustments to loosen some of the more stringent assumptions.

I find that protectionism was even more targeted at agriculture than the nominal rates suggest. While the effective rate of protection for agricultural goods was fairly similar to the nominal one in 1929, the effective rate was higher by almost 20 points in 1932. Protection of the food and beverage

3. D. Stegmann, "Deutsche Zoll- und Handelspolitik 1924/5-1929 unter besonderer Berücksichtigung agrarischer und industrieller Interessen," in *Industrielles System und politische Entwicklung in der Weimarer Republik*, ed. D. Petzina and B. Weisbrod (Athenäum-Verlag, 1977); D. Stegmann, "Mitteleuropa 1925–1934: zum Problem der Kontinuität deutscher Außenhandelpolitik von Stresemann bis Hitler," in *Industrielle Gesellschaft und politisches System*, ed. F. Fischer et al. (Dietz, 1978).

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

industry was already much higher in 1929 and rose to an even higher level by 1932. Imports in another strategically important sector, the fuel industry, saw effective protection spike much more than the nominal figures suggest.

5.2 The Effective Rate of Protection

The concept of effective protection goes beyond nominal tariff rates on an industry's output. It allows the consideration of how an industry is hurt by tariffs on its inputs which result in higher production cost. A firm that produces cars, for instance, may be in favor of higher automobile tariffs but if tariffs on steel, engines, or the coal used to fuel its factories also increase, the firm may ultimately be worse off than under a free trade regime. Effective protection of an industry is higher, the higher is protection of its output and the lower is protection of its input. The effective rate of protection then expresses the ratio of the increase in domestic value added as a result of the tariff structure, to the value added under free trade conditions.[5] Ruffin[6] has made the case that trade theory without intermediate goods is "like Napoleon without his army." Looking at effective protection rectifies this shortcoming. On the other hand, many authors have criticized the use of the effective rate as theoretically unconvincing. As Anderson explains, it "breaks down in general equilibrium" and "predicts neither changes in output nor any other economically interesting variable".[7] Anderson rectifies this shortcoming by adjusting the definition: He considers the effective rate in sector j to be "the uniform tariff (on distorted goods) which is equivalent to

5. R. J. Ruffin, "The Development of International Trade Theory," in *Palgrave Handbook of International Trade* (Springer, 2013), 24.

6. R. J. Ruffin, "A rehabilitation of effective protection," *Journal of International Trade and Economic Development* 17, no. 3 (2008): 334.

7. J. E. Anderson, "Effective protection redux," *Journal of international economics* 44, no. 1 (1998): 22.

the actual differentiated tariff structure in its effect on the rents to residual claimants in sector j."[8]

Despite widespread critique of its theoretical flaws, the concept of effective protection continues to be used by empirical researchers. Applications have, according to Greenaway and Milner, "exploited the fundamental utility of the concept" without disregarding the theoretical challenges.[9] They argue that, where more complex simulations of resource movements through computable general equilibrium analysis is not feasible, it is "more useful to be approximately right than precisely wrong"[10] and claim that effective protection has the advantage of both being simple to understand, forcing analysts of trade policy to think in general equilibrium terms, and being a robust indicator of relative protection across sectors.[11] [12]

5.3 Methodology

The vector of nominal tariff rates along with the matrix of input-output coefficients based on Fremdling and Stäglin's work allows me to calculate effective protection rates largely following the method of Kitson et al.[13]

8. Anderson, "Effective protection redux," 22.

9. D. Greenaway and C. Milner, "Effective protection, policy appraisal and trade policy reform," *World Economy* 26, no. 4 (2003): 445.

10. Ibid., 455.

11. Ibid., 454.

12. Chen et al. ("Revisiting the Effective Rate of Protection in the Late Stages of Chinese Industrialisation") have recently suggested adjustments to the conventional definition of the effective rate, which do not require two of its more stringent assumptions: complete tariff pass-through and one-step production. They find that the conventional measure tends to overstate the degree of protectionism. In this chapter, I apply more conventional approach used by Kitson et al. ("Effective protection and economic recovery in the United Kingdom during the 1930s"). As a robustness check I then adjust their approach using the first of Chen et al.'s modifications: allowing for multiple stages of production. I find that the difference in results is relatively small. Unfortunately data on demand and supply elasticities necessary to adjust for partial tariff pass-through is not available at the same level for interwar Germany, so it is not possible to make Chen et al.'s second adjustment.

13. Ibid.

The effective protection rate is commonly defined (for instance, by Capie[14] and based on Corden[15]) as:

$$ERP_j = \frac{\tau_j - \sum_{i=1}^{n} a_{ij}\tau_i}{1 - \sum_{i=1}^{n} a_{ij}} \tag{5.1}$$

where ERP_j = the rate of effective protection

τ_j = the nominal tariff rate on the produced good j

τ_i = the nominal tariff rate on the input good i

a_{ij} = the input-output coefficient indicating how many units of input i are required per unit of output j produced.

Various assumption need to be taken into account when estimating the effective rate of protection in this way. The estimates do not account for endogeneity of the relationship between the magnitude of a tariff and that sector's use of specific inputs. I have to assume the input-output technology to be fixed over time. Furthermore, the model is based on the assumption of a small economy with no price-setting market power. The input-output technology is also assumed to only have one step rather than multiple steps of inputs from various sectors.

I use the matrix-based calculation approach developed by Kitson et al.,[16] which is based on equation 5.1 but computationally more convenient[17], to estimate effective protection rates for all sectors of the German economy, both before and after the paradigm shift in trade policy. This approach is computationally more convenient than equation 5.1 and theoretically derived from the standard input-output formula.

14. F. Capie, "The British tariff and industrial protection in the 1930's," *The Economic History Review* 31, no. 3 (1978): 401.

15. W. M. Corden, "The structure of a tariff system and the effective protective rate," *Journal of Political Economy* 74, no. 3 (1966): 221–237.

16. Kitson et al., "Effective protection and economic recovery in the United Kingdom during the 1930s," 329.

17. Kitson et al. argue that an original attempt at calculating British efffective protection by Capie ("The British tariff and industrial protection in the 1930's") did not accurately apply the formula for effective protection, but Capie ("Effective Protection and Economic Recovery in Britain, 1932-1937") refutes this.

The equation used to estimate the vector e_{36} of effective rates in 1936 is

$$e_{36} = \hat{v^*}^{-1}(v_{36} - v^*) \tag{5.2}$$

where v_{36} is the vector of value added in 1936 for each sector, and v^* is the estimated vector of value added in the absence of tariffs, such that

$$v^* = x + (I - \hat{x} - A')(1 - t). \tag{5.3}$$

where x is the fraction of output exported in each sector; t is the tariff element of the output price assuming complete tariff pass-through with

$$t_i = \frac{\tau_{36i}}{1 + \tau_{36i}} \tag{5.4}$$

for each nominal tariff rate τ_i; A is the matrix of input-output-coefficients; and I is a 40x40 unit matrix. $\hat{v^*}$, $\hat{v}$, and $\hat{x}$ are matrices whose diagonal elements are the elements of the vectors v and x, respectively, and whose other elements are zero.

Similarly, I can calculate the vector of effective protection before the rise in protectionism, that is, for the year 1929, e_{29} as

$$e_{29} = \hat{v^*}^{-1}(v_{29} - v^*) \tag{5.5}$$

with

$$v_{29} = x + (I - \hat{x} - A')(I - \hat{t})(1 + \tau_{29}) \tag{5.6}$$

where τ_{29} is the vector of nominal tariffs in 1929 and $\hat{t}$ is a matrix with the elements of t on the diagonal.[18] I also calculate effective rates for 1932 using the same method to be able to compare the 1929 rates to the last year of democracy and the end of the Great Depression in Germany.

18. Kitson et al., "Effective protection and economic recovery in the United Kingdom during the 1930s," 330.

5.4 Data

In order to calculate estimates of effective protection, I need not only nominal tariff rates, but also an understanding of which intermediate goods are used by which industry. I make use of the input-output table constructed by Fremdling and Stäglin[19] for this. The table disaggregates the German economy of 1936 into 40 sectors, 30 of which produce traded goods. I was able to get A, x, and v from this input-output table.[20]

I use data on tariff revenues from the appendices to the *Reich* Statistical Office's publication *Der auswärtige Handel* for the year 1929 and the appendices to *Monatliche Nachweise über den auswärtigen Handel* for the years 1932 and 1936.[21][22][23] I then calculated τ_{36} based on trade[24] and tariff[25] data for 1936 from the Reich Statistical Office. For this, I digitized the total trade volume, value, and tariff revenue for the 2,107 goods of the German tariff classification, that is, the universe of German imports at the lowest available level of disaggregation by goods. I then assigned each good to one of the categories of the input-output table and calculated unit values and average nominal ad valorem equivalent tariff rates on output. The assignment is based on the detailed descriptions of each industrial sector provided by Fremdling and Stäglin.[26] I repeated the same for the the 2,102 goods in the 1932 import

19. Fremdling and Stäglin, "Output, national income, and expenditure: an input–output table of Germany in 1936"; R. Fremdling and R. Stäglin, "An Input-Output Table for Germany in 1936: A Documentation of Results, Sources and Research Strategy," *Jahrbuch für Wirtschaftsgeschichte/Economic History Yearbook* 55, no. 2 (2014): 187–298.

20. A is the input values for each industry pair divided by the gross production (rows 1-45) of the output industry, minus imports. v is rows 42-45 (gross value added) divided by rows 1-45 (gross production). x is column 45 (exports) divided by rows 1-45 (gross production).

21. Statistisches Reichsamt, *Der Auswärtige Handel Deutschlands im Jahr 1929*.

22. Statistisches Reichsamt, *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1932* (Reimar Hobbing, 1933), Ergänzungsheft.

23. Statistisches Reichsamt, *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1936* (Reimar Hobbing, 1937), Ergänzungsheft.

24. Ibid., December 1936.

25. Ibid., Ergänzungsband 1936.

26. Fremdling and Stäglin, "An Input-Output Table for Germany in 1936: A Documentation of Results, Sources and Research Strategy."

statistics and the 2,080 goods in the 1929 statistics to calculate τ_{29} and τ_{32}. Table 5.1 gives an overview of the categories and their relative importance in German trade for the years 1929, 1932, and 1936. The goods in rows 31 to 40 are non-traded but included in the input-output table.

When aggregating up the tariff data into the broader sectors, I use unweighted averages of nominal tariff rates to avoid the endogeneity issues pointed out by Anderson:[27] Since a higher tariff leads to falling imports for a given good, the weight of this good in a trade-weighted index of protection would fall. Consumer demand shifts towards relatively cheaper goods with lower tariffs and the level of protection measured by a trade-weighted average is biased downward. The measure I use still has that problem due to tariff discrimination between countries (demand may shift from a high-tariff country to a low-tariff one in the same good category, resulting in a falling average tariff), but using an unweighted average still reduces the bias.

5.5 Results

Table 5.2 shows the nominal and effective tariff rates for 1929 and 1932. The results show that the rise in protection for agriculture, one of the most discussed aspects of German interwar protectionism in the literature, is even more pronounced when I look at effective protection. While the nominal tariff rate rose from 9.1 % to 54.3 %, effective protection of agriculture increased from 10.7 % in 1929 to 73.1 % by 1932. Similarly, the rise in effective protection outpaced that in nominal protection by more than one percentage point for the fuel industry, production of basic iron and steel products, vehicles and aerospace manufacturing, saw mills and timber processing, and the spirits industry. In most other sectors, the nominal tariff rate overstates the increase in protection compared to the effective rate: Effective protection

27. J. E. Anderson, "Measurement of protection," in *Palgrave handbook of international trade* (Springer, 2013), 331.

Table 5.1: German Imports sorted by Industrial Sectors

		1929		1932		1936	
		Imports	**%**	**Imports**	**%**	**Imports**	**%**
1	Agriculture	5,747,546	42.7	2,332,392	46.5	1,742,852	41.1
2	Forestry, fishery	310,655	2.3	110,860	2.2	128,236	3.0
3	Mining	1,243,851	9.3	411,461	8.2	506,147	11.9
4	Fuel industries	425,219	3.2	95,305	1.9	194,900	4.6
5	Basic iron and steel products	145,643	1.1	58,527	1.2	48,587	1.2
6	Non-ferrous metals	199,536	1.5	56,962	1.1	57,200	1.4
7	Foundries	11,977	0.1	2,091	0.0	146	-
8	Fabricated iron and steel products	124,372	0.9	36,151	0.7	36,824	0.9
9	Machinery	136,804	1.0	43,908	0.9	31,162	0.7
10	Constructional steel	86,850	0.7	11,858	0.2	24,809	0.6
11	Vehicles and aerospace	74,376	0.6	11,649	0.2	9,281	0.2
12	Electrical engineering	50,877	0.4	23,611	0.5	18,178	0.4
13	Precision engineering, optics	28,232	0.2	7,619	0.2	9,797	0.2
14	Metal products	83,521	0.6	23,766	0.5	15,095	0.4
15	Stone and quarrying	142,437	1.1	67,845	1.4	90,218	2.1
16	Ceramics	23,356	0.2	6,493	0.1	3,345	0.1
17	Glass	34,505	0.3	12,984	0.3	8,054	0.2
18	Saw mills, timber processing	357,076	2.7	69,322	1.4	146,094	3.5
19	Manufactured wood products	88,373	0.7	41,837	0.8	29,832	0.7
20	Chemical industry	280,583	2.1	123,191	2.5	100,021	2.4
21	Chemical-technical industry	59,119	0.4	32,793	0.7	26,220	0.6
22	Rubber and asbestos manufacture	216,239	1.6	37,668	0.8	79,741	1.9
23	Manufacture of paper and paper products	70,042	0.5	25,895	0.5	21,022	0.5
24	Printing and duplicating	68,488	0.5	22,797	0.5	18,420	0.4
25	Leather industry	164,524	1.2	47,135	0.9	30,877	0.7
26	Textiles	1,153,088	8.6	361,224	7.2	280,099	6.6
27	Clothing	111,513	0.8	46,116	0.9	30,045	0.7
28	Edible oil and fats	263,397	2.0	233,427	4.7	39,925	0.9
29	Spirits industry	6,117	0.1	1,342	0.0	4,059	0.1
30	Food, beverages and tobacco	1,737,927	12.9	663,470	13.2	508,226	12.0
31	Building and construction	-	-	-	-	-	-
32	Electricity, gas and water	-	-	-	-	-	-
33	Wholesale trade	-	-	-	-	-	-
34	Retail trade	-	-	-	-	-	-
35	Transport and communication	-	-	-	-	-	-
36	Banking and insurance	-	-	-	-	-	-
37	Dwelling	-	-	-	-	-	-
38	Government	-	-	-	-	-	-
39	Other services	-	-	-	-	-	-
40	Domestic services	-	-	-	-	-	-

Imports are in 1000 Reichsmarks. Data sources: *Der auswärtige Handel Deutschlands im Jahr 1929*, *Monatliche Nachweise über den auswärtigen Handel*, December 1932 & 1936.

of constructional steel, glass products, products of the chemical-technical industry, and leather products fell instead of rising as the nominal rate would suggest. Effective protection of food and beverages rose less than the

Table 5.2: German Nominal and Effective Tariff Rates before and after the Great Depression

		1929		1932		Change in
		Nominal Rate	Effective Rate	Nominal Rate	Effective Rate	Effective Rate
1	Agriculture	9.1	10.7	54.3	73.1	62.4
2	Forestry, fishery	1.7	-0.3	3.4	0.9	1.2
3	Mining	0.4	-22.5	9.6	-12.4	10.1
4	Fuel industries	8.6	-5.7	21.1	64.6	70.3
5	Basic iron and steel products	6.6	-16.7	10.7	-7.6	9.1
6	Non-ferrous metals	2.0	-21.0	2.9	-20.6	0.4
7	Foundries	3.6	-2.9	5.9	-0.4	2.6
8	Fabricated iron and steel products	5.9	-21.4	4.9	-25.7	-4.4
9	Machinery	5.0	-26.9	5.7	-26.9	-0.0
10	Constructional steel	1.3	-23.2	1.7	-24.5	-1.3
11	Vehicles and aerospace	11.6	9.4	13.5	13.0	3.5
12	Electrical engineering	6.2	-15.1	4.0	-19.0	-3.9
13	Precision engineering, optics	6.2	-35.4	4.3	-37.4	-2.0
14	Metal products	6.2	-27.1	4.0	-31.1	-4.0
15	Stone and quarrying	7.3	5.1	3.5	0.0	-5.1
16	Ceramics	4.7	-22.6	5.1	-21.8	0.8
17	Glass	11.3	-19.1	7.0	-24.5	-5.4
18	Saw mills, timber processing	4.5	6.6	7.0	10.1	3.5
19	Manufactured wood products	8.5	1.7	10.0	2.5	0.8
20	Chemical industry	5.4	-37.6	8.5	-34.5	3.0
21	Chemical-technical industry	7.0	-5.4	8.4	-6.1	-0.7
22	Rubber and asbestos manufacture	8.8	-3.0	10.2	-2.0	1.0
23	Manufacture of paper and paper products	8.3	-15.3	8.2	-16.3	-1.0
24	Printing and duplicating	5.2	-1.9	3.9	-4.3	-2.3
25	Leather industry	5.4	-5.3	6.5	-8.5	-3.2
26	Textiles	8.7	-5.9	11.5	-3.3	2.6
27	Clothing	18.7	18.7	13.1	7.1	-11.6
28	Edible oil and fats	2.1	-1.2	17.3	13.2	14.4
29	Spirits industry	126.2	-314.0	123.4	-249.7	64.3
30	Food, beverages and tobacco	22.7	40.5	47.0	59.4	18.9
31	Building and construction	0.0	-2.3	0.0	-1.9	0.3
32	Electricity, gas and water	0.0	-1.6	0.0	-5.4	-3.7
33	Wholesale trade	0.0	-7.7	0.0	-7.9	-0.2
34	Retail trade	0.0	-0.7	0.0	-1.2	-0.4
35	Transport and communication	0.0	-15.1	0.0	-16.0	-0.9
36	Banking and insurance	0.0	-5.4	0.0	-5.5	-0.1
37	Dwelling	0.0	-0.5	0.0	-0.7	-0.2
38	Government	0.0	-6.4	0.0	-9.7	-3.3
39	Other services	0.0	-9.1	0.0	-13.4	-4.3
40	Domestic services	0.0	0.0	0.0	0.0	0.0

All rates are *ad valorem* equivalent and unweighted means of all goods imported within a given sector. Authors calculations based on: *Der auswärtige Handel Deutschlands im Jahr 1929*; *Monatliche Nachweise über den auswärtigen Handel*, December 1932 & Ergänzungsband.

nominal rate and protection of fabricated iron and steel products, electrical engineering products, metal products, stone and quarrying products, print

products, and clothing fell by more. Across all sectors, the biggest increases in effective protection occurred in agriculture (62.4 percentage points), the fuel industries (70.3), and the spirits industry (64.3), although the latter must be seen relative to the extremely negative level of effective protection (-314.0 in 1929, -249.7 in 1932).[28]

A closer look at the input-output table shows what is causing these big differences in some categories. In the case of output sector 1 (agriculture), the most important input sectors are fabricated iron and steel products (for which the already low average nominal ad valorem tariff declined after 1929) and the chemical industry (for which tariffs increased slightly but remained low at 8.2 %) as well as the non-traded sectors of building and construction and "other services", which were not directly subject to any nominal tariffs.[29] The main channel that would affect agriculture's effective protection negatively is the use of agricultural intermediate products such as fodder in livestock production, but this accounted for too little of the total input to offset the otherwise barely increased input costs.

Various manufacturing sectors (such as machinery, constructional steel, precision engineering, metal products) with single-digit nominal tariff rates turn out to have faced very negative effective protection rates. A big factor here is the higher nominal rate on basic iron and steel products which were an important input across most of these industries. Some sectors like precision engineering and electrical engineering also had a lower effective protection rate as a result of using their own outputs as intermediate goods, which also helps explain the extreme negative effective rate of the spirits industry, where

28. This extreme negative value is – somewhat paradoxically – the result of the high nominal tariff on spirits, since the main input of the spirits industry is its own output. At 22.6 % of gross output, the spirits industry has the second-lowest relative value added of all sectors, combined with the highest nominal tariff rate by far. In the year 1936, 406.5 million Reichsmark worth of spirits were used as inputs in this sector in the production of 853.4 million Reichsmark worth of output (compared to only 192.7 million Reichsmark of net value added.

29. Fremdling and Stäglin, "Output, national income, and expenditure: an input–output table of Germany in 1936," 375.

spirits themselves accounted for two thirds of the input. The food sector's most important input sector was agriculture, the tariff rate of which, while high, was less than half of that of the food and beverage sector. Apart from that, non-traded sectors such as transport and wholesale trade also accounted for much of the sector's inputs, further increasing its effective protection.

One result that stands out in particular in contrast to the results of Kitson et al.[30] and Capie[31] is the extreme concentration of protection in the agricultural sector even after the rise in protectionism. Kitson et al. find negative effective protection for most UK manufacturing in the pre-Ottawa period (up to 1932), so it is not surprising that the same is true for Germany in 1929. However, after the rise in British tariffs, effective protection reaches positive values for most industries in the UK whereas in Germany, effective protection remains negative for most sectors.

5.6 Adjustments

I now use the approach of Chen et al.[32] to remove one of the more stringent assumptions inherent in the conventional approach to effective protection: I can adjust the coefficients in the input-output matrix to accommodate for the existence of multiple intermediate steps of production.

Following Chen et al.'s[33] notation, this means that rather than using the matrix of input-output coefficients, A, I use $B = (I - A)^{-1} - I$, the complete-use coefficient matrix (whereas A would be the direct use coefficient matrix. The inverse of $I - A$ is equivalent to the infinite series of $I + A^1 + A^2 + \ldots + A^\infty$ (see the appendix for a more detailed derivation) and therefore depicts an adjustment for multiple rounds of intermediate goods use. However, B

30. Kitson et al., "Effective protection and economic recovery in the United Kingdom during the 1930s."

31. Capie, "Effective Protection and Economic Recovery in Britain, 1932-1937."

32. Chen et al., "Revisiting the Effective Rate of Protection in the Late Stages of Chinese Industrialisation."

33. Ibid., 429.

can not be used directly to calculate effective rates of protection, because its elements b_{ij} do not sum to one minus the value added in each column as the elements of A do.[34] I therefore have to normalize the matrix, so that I get a new matrix C with elements c_{ij} where:

$$c_{ij} = \frac{b_{ij}}{\sum_i b_{ij}} \sum_i a_{ij} \tag{5.7}$$

This matrix fulfills the criterion that $\sum_j bij = 1$ for all output sectors j and I can use it to calculate effective protection rates.

The new effective rate of protection is then[35]

$$NERP_j = \frac{1 - \sum_{i=1}^{n} c_{ij} t_i}{1 - \sum_{i=1}^{n} c_{ij}} \tag{5.8}$$

The matrix equations based on Kitson et al.'s work from the previous section then become:

$$v^* = x + (I - \hat{x} - C')(1 - t). \tag{5.9}$$

$$v_{29} = x + (I - \hat{x} - C')(I - \hat{t})(\text{I} + \tau_{29}) \tag{5.10}$$

Based on these new equations, I calculate the new adjusted effective rate of protection. Table 5.3 shows the results. The first and third column repeat the effective rate of protection for 1932 following the conventional approach. The second and fourth column show the rate with adjustments made for multiple production stages.

The adjusted rate is fairly similar to the conventional version of the ERP with a few notable exceptions. Protection of fuel in 1932 drops to an extreme negative value with the assumption of multiple production steps. The main input sector here is fuel itself, so that in a multi-stage production model,

34. Ibid., 430.
35. Ibid.

Table 5.3: German Effective Tariff Rates for 1932 with and without Adjustments

		One-stage 1929	Multi-stage 1929	One stage 1932	Multi-stage 1932
1	Agriculture	10.7	10.6	73.1	72.6
2	Forestry, fishery	-0.3	-0.5	0.9	0.1
3	Mining	-22.5	-22.5	-12.4	-12.0
4	Fuel industries	-5.7	19.7	64.6	-96.2
5	Basic iron and steel products	-16.7	-49.2	-7.6	-27.9
6	Non-ferrous metals	-21.0	-26.1	-20.6	-27.8
7	Foundries	-2.9	-3.2	-0.4	-0.9
8	Fabricated iron and steel products	-21.4	-26.5	-25.7	-32.8
9	Machinery	-26.9	-28.0	-26.9	-28.6
10	Constructional steel	-23.2	-26.7	-24.5	-28.9
11	Vehicles and aerospace	9.4	10.6	13.0	12.6
12	Electrical engineering	-15.1	-15.4	-19.0	-20.4
13	Precision engineering, optics	-35.4	-34.8	-37.4	-37.5
14	Metal products	-27.1	-29.8	-31.1	-35.0
15	Stone and quarrying	5.1	5.1	0.0	-0.5
16	Ceramics	-22.6	-22.0	-21.8	-21.8
17	Glass	-19.1	-18.6	-24.5	-24.9
18	Saw mills, timber processing	6.6	5.5	10.1	8.1
19	Manufactured wood products	1.7	2.0	2.5	2.6
20	Chemical industry	-37.6	-38.7	-34.5	-36.4
21	Chemical-technical industry	-5.4	-5.5	-6.1	-6.9
22	Rubber and asbestos manufacture	-3.0	-2.9	-2.0	-2.2
23	Manufacture of paper and paper products	-15.3	-16.7	-16.3	-20.4
24	Printing and duplicating	-1.9	-2.0	-4.3	-5.7
25	Leather industry	-5.3	-4.8	-8.5	-7.1
26	Textiles	-5.9	-5.6	-3.3	-3.3
27	Clothing	18.7	20.3	7.1	7.6
28	Edible oil and fats	-1.2	-1.1	13.2	15.0
29	Spirits industry	-314.0	-104.1	-249.7	-80.1
30	Food, beverages and tobacco	40.5	39.8	59.4	70.3
31	Building and construction	-2.3	-2.0	-1.9	-2.1
32	Electricity, gas and water	-1.6	-2.1	-5.4	-5.6
33	Wholesale trade	-7.7	-7.7	-7.9	-8.5
34	Retail trade	-0.7	-1.5	-1.2	-2.7
35	Transport and communication	-15.1	-15.1	-16.0	-16.3
36	Banking and insurance	-5.4	-5.4	-5.5	-5.7
37	Dwelling	-0.5	-1.0	-0.7	-1.7
38	Government	-6.4	-5.5	-9.7	-8.9
39	Other services	-9.1	-8.8	-13.4	-14.0
40	Domestic services	0.0	0.0	0.0	0.0

the high input tariffs applied several times outweigh the high output tariffs. Protection for production of iron and steel and various other metal products is more negative than under the conventional model. For the biggest outlier in the table, the spirits industry, adjusting the rate for multiple production steps significantly raises effective protection (though it is still negative). Generally

the result that protection for agricultural goods, and food and beverages far exceeded that in other sectors remains robust under this new modification.

5.7 Conclusion

Effective protection of the agricultural sector after the shift towards a high tariff regime in the Weimar Republic was much higher than the nominal rates suggest. Most other sectors experienced negative protection in this period. Effective protection was particularly low in 1932 for various forms of metal product manufacturing. The results of this chapter suggest that the shift towards protectionism during the Great Depression was even more lopsided than the nominal rates suggest. This may well be an accidental result of the trade policy by omission induced by the fall in global commodity prices especially in the agricultural sector. Agricultural imports would have been the target of extremely high nominal ad valorem tariff rates even in the absence of legislative changes. The deflation during the Great Depression and drastic legislative measures added up with the impact of effective protection presented in this chapter to an almost insurmountable tariff wall that shielded the agricultural sector from international competition.

The effective protection rates presented here do not account for non-tariff measures such as exchange controls, which played an increasingly important role in the 1930s. At least with regard to tariffs, however, special interests appear to have prevailed in the placement of tariffs at the expense of modern manufacturing industries, even when the cause of rising protectionism was driven by international monetary conditions. The exporting industries therefore suffered twice, both from negative protection and from the beggar-my-neighbor effects in important export markets as a result of devaluation.

One further caveat is necessary: the model used here cannot account for differences in full or partial tariff pass-through. Disaggregated data on

demand and supply elasticities would be necessary to accurately reflect this, which unfortunately are not available for the period under investigation.

6

The German Shift Towards Protectionism and its Impact on Trade

6.1 Introduction

When the Great Depression hit Germany in 1929 and trade collapsed over the following years at an unprecedented pace, the government of the Weimar Republic also experienced a paradigm shift in trade policy.[1] 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

1. see, for instance, Greiff (*Die neuen Methoden der Handelspolitik*) or Stegmann ("Mitteleuropa 1925–1934: zum Problem der Kontinuität deutscher Außenhandelpolitik von Stresemann bis Hitler"; "Deutsche Zoll- und Handelspolitik 1924/5-1929 unter besonderer Berücksichtigung agrarischer und industrieller Interessen")

at all costs. Tariffs skyrocketed over the course of the years 1930 and 1931. And while Germany became less reliant on imports from major Western trading partners, imports from Southeastern Europe and Latin America – the so-called Reichsmark Bloc – began to play an increasingly important role. The spiraling deflationary forces of the period further pushed up protection as the monetary value of imports fell relative to the weight-specific tariff rates.

Germany was not alone in experiencing a simultaneous increase in protectionism and sharp decline in trade – so did, for instance, the United States[2] and the United Kingdom[3] –, but to what extent one caused the other remains debated in the literature.[4] Kaiser writes that "[a]lthough the revival of German imports from Eastern Europe between 1933 and 1936 was impressive, it by no means represented a dramatic new pattern of trade or an unprecedented reliance on that area.[5] 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 was not due to policy shifts but was the result of endogenous trends.[6]

Specifically for Germany, Ritschl has made use of unpublished foreign exchange balance sheets for 1938 to 1940 and found that "the extension of Nazi Germany's trade with the countries of south-eastern Europe appears to a large extent merely as a return to the position of dominance that the Habsburg monarchy and imperial Germany jointly had in the Balkans before the First

2. D. A. Irwin, "The Smoot-Hawley tariff: A quantitative assessment," *Review of Economics and Statistics* 80, no. 2 (1998): 326–334.

3. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection."

4. When looking at the United Kingdom, Kitson et al. (*Protectionism and economic revival: the British inter-war economy*) attribute a large share of the trade decline in the interwar period to protectionism.

5. D. Kaiser, *Economic Diplomacy and the Origins of the Second World War: Germany, Britain, France, and Eastern Europe, 1930-1939*, Princeton Legacy Library (Princeton University Press, 1980), 149.

6. Eichengreen and Irwin, "Trade blocs, currency blocs and the reorientation of world trade in the 1930s"; Wolf and Ritschl, "Endogeneity of currency areas and trade blocs: evidence from a natural experiment"; J. Gowa and R. Hicks, "Politics, Institutions, and Trade: Lessons of the Interwar Era," *International Organization* 67, no. 3 (July 2013): 439–467.

World War," concluding that "the economic penetration of that region by German trade was not simply a particular characteristic of Nazi policies, but a more complex phenomenon, in which the collapse of central European trade with Russia played a pivotal role."[7] He argues that "German autarky policies in the 1930s were to a large extent a process of selective disengagement from trade with the US, Great Britain, and France."[8] In contrast, Kitson and Solomou attribute the fact that Germany is the only major economy with a marked shift towards bilateral trade during the 1930s to its autarkic policies,[9] Albers has furthermore shown that trade policy decisions were in part made in response to currency devaluation decisions in other countries. When various countries, most prominently the United Kingdom, left the gold standard from 1931 onwards, Germany responded with retaliatory tariffs to offset the diminished competitiveness of its domestic products.[10]

More recently, de Bromhead et al.[11] and Arthi et al.[12] 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 discriminatory trade policies such as imperial preference contributed much more to the reorientation of both British and Indian trade in the 1930s than the aggregate data suggest.

7. A. O. Ritschl, "Nazi economic imperialism and the exploitation of the small: evidence from Germany's secret foreign exchange balances, 1938-1940," *The Economic History Review* 54, no. 2 (2001): 338.

8. Ibid., 343.

9. M. Kitson and S. Solomou, "Bilateralism in the interwar world economy," *Bulletin of Economic Research* 47, no. 3 (1995): 210.

10. Albers, "Currency devaluations and beggar-my-neighbour penalties: evidence from the 1930s."

11. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection."

12. V. Arthi et al., *The Impact of Interwar Protection: Evidence from India*, Working Paper, Working Paper Series 27178 (National Bureau of Economic Research, May 2020).

In this chapter, I apply de Bromhead et al.'s methodology to German trade and protectionism in the interwar period. I construct a new data set of imports of 530 goods from 50 countries, measured annually from 1925 to 1938. I estimate elasticities of substitution for these varieties and then employ them in a CGE model to simulate how trade would have changed under a counterfactual trade policy with tariffs and other measures frozen at their 1929 level. By comparing counterfactual trade to actual trade, I can isolate the impact of trade policy on trade. I find a large effect of tariffs, quotas, exchange controls, clearing agreements, and treaty-based import guarantees on the total value of German imports by 1933. Imports fell by approximately 30 % compared to the counterfactual scenario. However, I find no positive – and, in fact, a slight negative – effect on the share of Reichsmark bloc countries in total imports. Despite the use of preferential rates and clearing agreements with bloc members, the protectionist measures examined here did not contribute to the geographical shift towards Southeastern Europe and Latin America in total trade and only contributed very little to the shift within agricultural goods and raw materials. Furthermore, tariffs and quotas mattered a lot for the decline in imports of food, fuel, and consumer products, but less for capital and industrial goods.

The remainder of this chapter proceeds as follows: Section 6.2 gives a brief overview of the literature. In section 6.3, I discuss the trade policy of interwar Germany in more detail. Section 6.4 describes the data sources. Section 6.5 provides a primer on computable general equilibrium modeling and explains why it is a useful tool for understanding the impact of trade policy. Section 6.6 explains the theoretical framework and derives the elasticities used in the simulations. Section 6.7 presents the counterfactuals with the results of the simulations, before I conduct some robustness checks in section 6.8. Section 6.9 concludes.

6.2 Literature

The literature's assessment of the impact of interwar trade policy has been mixed. Eichengreen and Irwin have argued that "evidence of regionalization due to the formation of trade and currency blocs is less compelling" and that while the countries of Central Europe traded more with each other "than would be predicted by their economic characteristics", this trend is "already evident in 1928 before (...) the German bloc was formed."[13] This tendency is also noted by Ellis.[14] Eichengreen and Irwin cite a contemporary argument by Basch,[15] who sees the formation of the Reichsmark bloc as primarily enhancing Germany's self-sufficiency in raw materials rather than increasing trade. Their argument was supported by the the finding of Wolf and Ritschl[16] that "countries that traded intensively with Germany in 1928, and less so with France and Britain, were likely to be members of the Reichsmark or the Exchange-Control Bloc in the 1930s". Trade dependence on Germany, they argue, "was a pre-existing condition."[17]

Gowa and Hicks largely agree with this assessment. They find that the Reichsmark bloc "maintained preexisting trade between Germany and smaller member states but sharply reduced trade between the latter."[18] Their results suggest that "beggar-thy-neighbor effects were negligible" and "little change is apparent in member-nonmember trade across time".[19]

The argument that Germany deliberately used its trade policy to exploit small trading partners has a long tradition in the literature going back

13. Eichengreen and Irwin, "Trade blocs, currency blocs and the reorientation of world trade in the 1930s," 3.

14. H. Ellis, "German Exchange Control, 1931-1939: From an Emergency Measure to a Totalitarian Institution," *The Quarterly Journal of Economics* 54, no. 4 (1940): 1–158.

15. A. Basch, *The New Economic Warfare* (Literary Licensing, LLC, 1941).

16. Wolf and Ritschl, "Endogeneity of currency areas and trade blocs: evidence from a natural experiment."

17. Ibid., 306.

18. Gowa and Hicks, "Politics, Institutions, and Trade: Lessons of the Interwar Era," 440.

19. Ibid., 454.

to Einzig[20] and Ellis[21] and was generalised by Hirschman.[22] Hedberg and Håkansson,[23] on the other hand, find no evidence of such exploitation in a case study investigating Germany's relationship with Sweden. Ritschl[24] also finds no evidence of trade exploitation in the German sphere of influence ahead of World War II (and intense exploitation after occupation). In the case of Southeastern Europe, Roselli argues that the economies of the region profited not only from preferential treatment in trade policy, but also from an "evident complementarity" with the German economy, with a focus on agricultural exports compared to Germany's more industrial economy, as well as geographic proximity.[25] As Roselli explains, the "dramatic fall in agricultural prices after 1928" may have driven the Reichsmark bloc countries into the arms of the Germans, as they "were able to find a stable and long-lasting market of destination for their commodities" – thanks to bilateral clearing agreements – "whereas France and Britain had (...) commercially retreated from this area."[26] The Southeastern countries responded to German demand with shifts in their export structure: Bulgaria, for instance, instead of focusing on "more widely marketable crops such as wheat", increasingly produced tobacco, cotton, grapes, and dairy products.[27]

So what was the impact of German trade policy? Kitson[28] lists four strategic objectives that became central under the Nazis:

20. P. Einzig, *Bloodless Invasion: German Economic Penetration Into the Danubian State and the Balkans* (London: Duckworth, 1939).

21. Ellis, "German Exchange Control, 1931-1939: From an Emergency Measure to a Totalitarian Institution."

22. A. O. Hirschman, *National power and the structure of foreign trade* (University of California Press, 1980).

23. P. Hedberg and E. Håkansson, "Did Germany Exploit Its Small Trading Partners? The Nature of the German Interwar and Wartime Trade Policies Revisited from the Swedish Experience," *Scandinavian Economic History Review* 56, no. 3 (2008): 246–270.

24. Ritschl, "Nazi economic imperialism and the exploitation of the small: evidence from Germany's secret foreign exchange balances, 1938-1940."

25. A. Roselli, *Money and trade wars in interwar Europe* (Springer, 2014), 139.

26. Ibid., 140.

27. Ibid.

28. M. Kitson, "The move to autarky: The political economy of Nazi trade policy," *DAE Working Paper*, no. 9201 (1992).

> "(i) to obtain the best price for German exports and the lowest price for imports,
>
> (ii) to isolate Germany's trading relationships from the international trading system and to establish independent bilateral agreements,
>
> (iii) to reorientate the geography of German trade in order to obtain necessary goods from accessible areas,
>
> (iv) to reduce German dependence on foreign goods and increase national self-sufficiency."[29]

Kitson comes to the conclusion that Germany was not able to significantly improve its terms of trade with protectionism (contrary to Child,[30] but in line with Kindleberger[31]) because it prioritised other goals.[32] The share of bilateral trade, as measured by a Grubel-Lloyd-style index of concentration[33], went through a "major and sustained increase" after 1932.[34] Kitson argues that the "conduct of trade policy was effective in stabilising Germany's trading relations" in particular with "the countries of South and Eastern Europe."[35]

Kitson also estimates the impact of Nazi trade policy on the volume of imports and suggests that "trade policy working through the price of imports and through non-price factors significantly reduced German imports."[36] Based on aggregated data, he finds a negative and statistically significant effect of the tariff rate on the log of import volume of -0.22.[37]

29. Ibid.

30. N. Child, *The Theory and Practice of Exchange Control in Germany: A Study of Monopolistic Exploitation in International Markets*, International Scholars Forum (Springer Netherlands, 1958).

31. C. P. Kindleberger, *The terms of trade: a European case study* (Published jointly by the Technology Press of Massachusetts Institute of . . ., 1956).

32. Kitson, "The move to autarky: The political economy of Nazi trade policy," 8.

33. This index in its application to bilateral trade is taken from Pomfret (*Unequal trade: The economics of discriminatory international trade policies*). The original version of the index as a measure of intra-industry concentration was developed by Grubel and Lloyd ("The empirical measurement of intra-industry trade").

34. Kitson, "The move to autarky: The political economy of Nazi trade policy," 9.

35. Ibid., 11.

36. Ibid., 13.

37. Ibid., 20.

6.3 German Trade Policy during the Great Depression

6.3.1 General Tariffs

The political history of German trade policy in the 1930s has been extensively laid out in standard works by Teichert[38] and Petzina.[39] German tariffs remained relatively stable for several years after the introduction of the "small tariff amendment" of 1925 that returned most rates to their 1902 level. Tariffs were only moderately high at this point and, in comparison to other countries, did not stand out as unusual (see Eichengreen and Irwin[40]). 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.

Tariffs were raised at numerous points between 1929 and 1939 leading to Germany becoming the country with by far the highest average tariff rate among major interwar economies by 1935.[41] The most extensive amendments to the tariff code after the "small tariff amendment" of 1925 were those in December 1929 and April 1930.[42] 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.[43] The year 1930 constituted a paradigm shift in this regard. Tariffs rose sharply after that, at first primarily in agriculture.

38. E. Teichert, *Autarkie und Großraumwirtschaft in Deutschland 1930-1939: Außenwirtschaftspolitische Konzeptionen zwischen Wirtschaftskrise und Zweitem Weltkrieg*, vol. 30 (Oldenbourg, 1984).

39. D. Petzina, *Autarkiepolitik im Dritten Reich: Der nationalsozialistische Vierteljahresplan*, Schriftenreihe der Vierteljahrshefte für Zeitgeschichte (De Gruyter, 1968).

40. Eichengreen and Irwin, "The slide to protectionism in the Great Depression: Who succumbed and why?"

41. Ibid.

42. United States Tariff Commission, *Foreign-trade and exchange controls in Germany: A report on the methods and policies of German foreign-trade control, with special reference to the period 1931 to 1939* (Washington, D.C.: U.S. Govt. Print. Off., 1943), 39.

43. Ibid., 40.

Industrial duties also increased, albeit not as much and mostly as a result of falling prices. Many raw materials, on the other hand, such as hides and skins, cotton, wool, silk, rubber, and coal were exempt from duties.[44]

Almost all German tariffs in the interwar period were set as specific rates, in Reichsmark per unit of weight, rather than as an ad valorem rate in per cent of the import value. When world prices began to fall during the Depression, relative rates therefore began to increase even without any government interference.[45] It also meant that even in the absence of any legislative changes, German trade policy would have automatically become more restrictive in a period of falling prices. This sort of protectionism by omission has been described by Crucini[46] for the United States. Crucini argues that the Hawley-Smoot Tariff Act of 1930 "did not have the massive deflationary implications that are widely attributed to it. In fact, (...) the opposite is true: The variations in real tariff rates caused by the Hawley-Smoot Tariff Act are quite small relative to the variations in real tariff rates caused by price deflation."[47][48]

In a series of 18 ministerial decrees between January 1932 and the appointment of Hitler to the chancellorship in January 1933, the German government introduced 225 further tariff increases.[49] Under the National

44. Ibid., 42.

45. This also means that effectively imports in the same category could be subject to vastly different relative tariffs depending on the unit value of a specific good. This effectively resulted in a policy that was more protectionist against lower quality – and hence less valuable – imports within the same category of goods.

46. M. J. Crucini, "Sources of Variation in Real Tariff Rates: The United States, 1900-1940," *The American Economic Review* 84, no. 3 (1994): 732–743.

47. Ibid., 741.

48. Irwin shows that the protectionist Republican party took advantage of the resulting real tariff increase: "These price movements assisted Republicans in putting the tariff where they apparently desired it to go anyway, meaning that the legislative change was smaller than otherwise would have been necessary to hit a particular target." (Irwin, "The Smoot-Hawley tariff: A quantitative assessment," 1023) That the Republicans ensured the use of specific tariff rates instead of ad valorem rates through their congressional majority was, Irwin argues, "a means to (the) end" of automatically rising tariffs during deflationary periods.

49. United States Tariff Commission, *Foreign-trade and exchange controls in Germany: A report on the methods and policies of German foreign-trade control, with special reference to the period 1931 to 1939*, 41.

Socialist government, however, tariffs lost a lot of their importance in regulating import flows as the government began to more directly interfere in the economy.

Graph 6.1 breaks down the change in the average tariff rates further into monthly intervals based on tariff revenue data from the statistical yearbooks[50] and trade value data from the monthly reports on trade.[51] The graph shows the moving average over 12 months of the monthly tariff revenues divided by the monthly trade value. The end of the restrictions set out in the Treaty of Versailles is clearly visible in 1925 when the small tariff reform re-introduced and raised tariffs back to their pre-war levels for many goods. Between 1925 and 1929, tariff rates were then on a slight downward trajectory thanks to a series of MFN treaties signed by the German government. Trade policy took a sudden turn towards more protectionism shortly after the accession of Heinrich Brüning as *Reich* Chancellor and DNVP politician Martin Schiele as minister for agriculture in March 1930. From a local minimum of 7.6 % in November 1929, tariffs shoot up, partially through legislative measures, partially through a rise in the ad valorem rate due to rapidly declining international commodity prices, to a level of around 25 % by the summer of 1932, accompanied by the introduction and gradual tightening of exchange controls from July 1931. Tariffs then reached a plateau for several months and also initially did not move much in the first months of Hitler's chancellorship. The upwards movement then continued with the introduction of Hjalmar Schacht's New Plan in September 1934 and the moving average of the tariff rate reached a new high point in the third quarter of 1935 at 35.0 %,[52] after

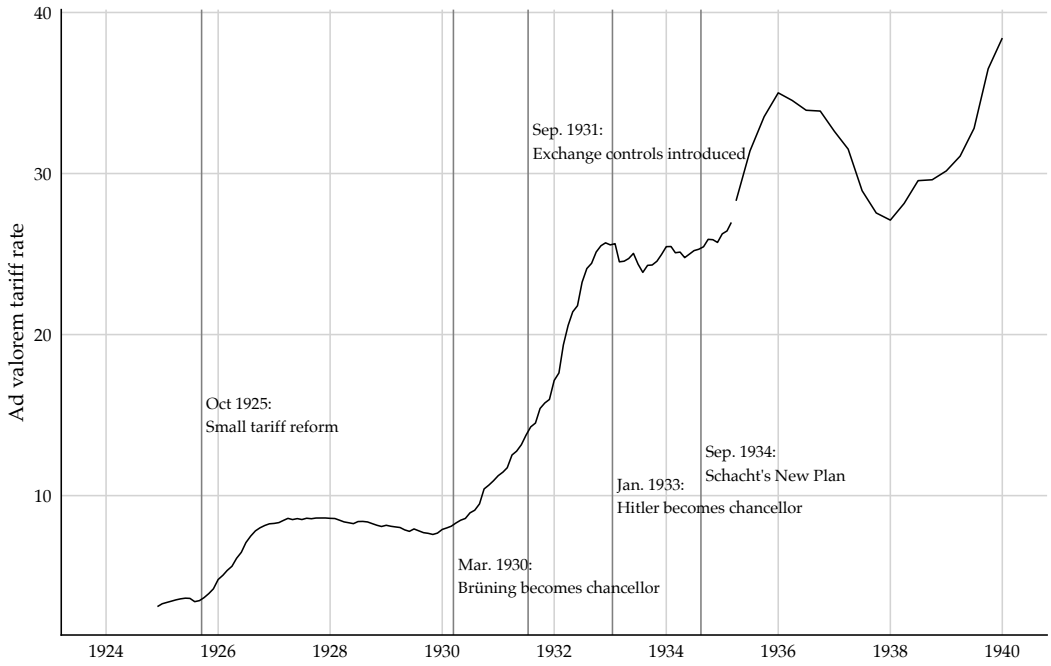
50. Statistisches Reichsamt, *Statistisches Jahrbuch für das Deutsche Reich* (1925–1939), various volumes.

51. Statistisches Reichsamt, *Der Auswärtige Handel Deutschlands in den Jahren 1925-27* (Reimar Hobbing, 1928), various volumes; Statistisches Reichsamt, *Der Auswärtige Handel Deutschlands im Jahr 1929*; Statistisches Reichsamt, *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember* (Reimar Hobbing, 1930–1939).

52. From 1935 onwards, the data available are quarterly rather than monthly. I report a moving average over 4 quarters in the graph.

which they briefly fell, then rose again to an even higher peak of 38.4 % shortly before the start of the war.

Figure 6.1: Monthly ad valorem equivalent tariff on German imports



Moving 12-month average of tariff revenue divided by import value. After September 1934, data are quarterly.
Author's calculations based on Monatliche Nachweise über den auswärtigen Handel, Statistisches Jahrbuch für das Deutsche Reich.

Source: Author's calculations based on data from Statistisches Jahrbuch für das Deutsche Reich, Der auswärtige Handel Deutschlands, Monatliche Nachweise über den auswärtigen Handel

Tariffs are included in the model as ad valorem equivalent rates constructed by dividing the specific rate by the unit value of the good. The unit value is the value of one unit of the good (either one kilogram or, in some cases, one piece) and can be calculated by dividing the trade volume in weight by the trade value in Reichsmark. Both values and volumes are included in the official trade statistics.

Not all trade partners were subject to the same tariff hikes. Germany increasingly used discriminatory measures for a variety of reasons, from political pressure over territorial disputes with Poland to retaliatory measures against currency devaluations.

Punitive tariffs and the *Obertarif*

Germany applied punitive tariffs to a range of imports from Poland from 1925 to the end of the German-Polish trade war in 1934. In 1932 these punitive tariffs were formalised in the *Obertarif*, a set of tariffs that the German government could implement against countries without MFN status at will. Apart from Poland, these rates were only applied in two other cases and only for a few months: against Canada from April to June 1932, and against Argentina from January to February 1933.[53] These changes are reflected in the tariff variable in the model.

Value compensation tariffs

As a consequence of the devaluation of various currencies of Germany's European trading partners, imports from these countries became significantly cheaper for German consumers. Demand for additional tariffs on these imports was particularly loud from German agriculture regarding butter imports, primarily from the Scandinavian countries, and from the coal mining sector in the Ruhr area regarding English coal imports. To protect German businesses, the government therefore introduced an additional tariff of 15 % ad valorem on butter from Sweden, Denmark, Finland, and New Zealand in January 1932, raising the total tariff to 136 Reichsmark per 100 kg.[54] The government refused to introduce a surcharge on coal imports, however, since it would have raised costs for Germany's export-oriented manufacturing industry. The value compensation tariffs are included in the tariff variable in the model.

53. United States Tariff Commission, *Foreign-trade and exchange controls in Germany: A report on the methods and policies of German foreign-trade control, with special reference to the period 1931 to 1939*, 39.

54. G. R. von Radiis, "Die deutsche Außenhandelspolitik unter dem Einfluß der Devisenbewirtschaftung von 1931 bis 1938" (PhD diss., University of Zurich, 1939), 49.

Preferential tariffs

The German government began to use preferential tariffs for agricultural goods in trade relations with Southeastern Europe in 1931, despite the protests of its Western trading partners who insisted on upholding the most-favoured-nation clauses in their treaties with Germany. An attempt to form a customs union with Austria, intended as a "key to obtaining a wholesale revision of the Versailles Treaty",[55] failed due to French opposition to the project.

The use of preferential tariffs became widespread under the New Plan. A new trade treaty with the Netherlands included various quotas and tariff reductions, which normally would have been subject to MFN rules, but the German government circumvented this through the use of the *Reichsstellen*, institutions set up for the control of imports for agricultural goods.[56] From 1934 the expansion of the previous *Reichsstelle* for oils and fats to include dairy products made it possible to give preferential treatment to Dutch eggs, cheese and butter. Similar preferential agreements were soon included in the trade treaty amendment with Switzerland (in December 1933 and July 1934, for cheese) and a new treaty with Denmark in March 1934 (for cheese and fatstock).[57]

A new trade treaty with Hungary included a preferential tariff for wheat and a quota for livestock that was imported at a discounted rate.[58] A trade treaty with Bulgaria from 1933 included preferential tariffs for grain. Preferential tariff agreements with Yugoslavia and Romania were negotiated but could not be passed into law.[59] Germany would have required the acquiescence of its most-favoured-nation treaty partners to ratify the preferential rates. The United States, one of the biggest grain exporters

55. W. Grenzebach, *Germany's Informal Empire in East-central Europe*, v. 2 (1978), 14.

56. von Radiis, "Die deutsche Außenhandelspolitik unter dem Einfluß der Devisenbewirtschaftung von 1931 bis 1938," 119.

57. Ibid., 120.

58. P. A. F. Loose, *Deutschlands Handelsvertragspolitik der Nachkriegszeit* (Bauer, 1939).

59. Ibid., 24.

and therefore particularly affected by the grain preferences, refused to grant its approval.[60] The German government was not deterred by the protests and continued to develop new ideas to circumvent the MFN clause, though, as Pomfret argues, German trade policy did not "become obviously discriminatory before 1934."[61] In negotiations with Yugoslavia, Germany proposed a guaranteed quota for plum imports that was supposed to be a "purely 'private' transaction between the German canning industry and *Prizad*, the Yugoslav state trading organization," a "convenient fiction" that the Germans hoped would cloud the government's involvement in the concessions.[62]

Lampe[63] points to the "perceived French retreat from the region, the British reluctance to take their place, and the difficulty of dealing with the Soviet Union" as decisive factors that left the Southeastern European governments with little choice but to intensify trade relations with Nazi Germany. By the summer of 1933, with the new Nazi government in power, Germany began to "systematically bypass" the most-favoured-nation principle,[64] beginning with special concessions to Hungary and Yugoslavia. In 1934, the Nazi Economics Ministry under Hjalmar Schacht negotiated new trade treaties with Hungary and Yugoslavia. In 1935, a treaty with Romania followed. All of these treaties included confidential agreements, in which Germany granted preferential tariffs and guaranteed the purchase of goods at reduced prices.[65] Germany "agreed to purchase specific amounts of wheat and corn, as well as lumber, lard, poultry, eggs, oil seeds, fruits, and vegetables" from Yugoslavia, "granting tariff preferences on these products and effectively paying prices for

60. Grenzebach, *Germany's Informal Empire in East-central Europe*, 17.

61. Pomfret, *Unequal trade: The economics of discriminatory international trade policies*, 29.

62. Grenzebach, *Germany's Informal Empire in East-central Europe*, 30.

63. J. Lampe, *Balkans into Southeastern Europe, 1914-2014: A Century of War and Transition* (Palgrave Macmillan, 2006), 134.

64. Grenzebach, *Germany's Informal Empire in East-central Europe*, 32.

65. Gross, *Export Empire: German Soft Power in Southeastern Europe, 1890–1945*, 189.

them that were above the world market price."[66] Grenzebach suggests that the guaranteed purchases "increased trade in specific commodities beyond the 1929 level and allowed particular branches of Yuguslav agriculture to reap enormous benefits from the changed pattern of German imports."[67] Imports of live animals from Yugoslavia increased by 3,490 %, meat imports by 1,190 %, lead ore by 873 %, with further big increases in flax, hides, bauxite, fruit, and copper, while imports in Yugoslavia's more "traditional exports" – eggs, wheat, and corn – fell behind, despite German concessions in the negotiations for these goods.[68]

Romania received German preferential tariffs on "timber, select minerals, soybeans and oil seed crops, poultry, eggs, cattle, and cereal, again paying prices above those of the world market," but not on Romania's most important export product, petroleum, which the country was easily able to sell on the world market.[69] The German purchase guarantees for Romania amounted to 37 million marks, approximately 50 % of Germany's imports from Romania in 1934. The secret appendices to the treaty also provided for barter trade exchanging Romanian cattle for chemical products from the German chemical conglomerate IG Farben.[70]

6.3.2 Trade Treaties

In Southeastern Europe, Germany attempted to intensify its trading relations a lot through discriminatory clauses in new trade treaties. An agreement with the Hungarian government in the fall of 1933 guaranteed the German purchase of the Hungarian flax harvest.[71] A new trade treaty with Yugoslavia

66. Ibid.
67. Grenzebach, *Germany's Informal Empire in East-central Europe*, 41.
68. Ibid., 42.
69. Gross, *Export Empire: German Soft Power in Southeastern Europe, 1890–1945*, 190.
70. Grenzebach, *Germany's Informal Empire in East-central Europe*, 74.
71. von Radiis, "Die deutsche Außenhandelspolitik unter dem Einfluß der Devisenbewirtschaftung von 1931 bis 1938," 123.

from May 1934 provided new tariff reductions. A compensation agreement with Poland opened up the path towards more trade with Germany's eastern neighbor in October 1934, but trade relations weren't normalized until November 1935 when a full economic treaty came into force, including import quotas for Polish agricultural products.[72]

Through the course of the 1930s, trade treaties increasingly included special arrangements for specific categories of goods. The German government guaranteed in an unpublished protocol to the German-Danish Treaty for the Exchange of Goods on March 1934 to make available import certificates for Danish butter, cheese, meat, livestock, and chicken eggs that ensured that Danish imports to Germany in these categories would be kept at 40 to 100 % of their value in previous years.[73] These agreements were extended annually.[74] However, all of these categories were also subject to quantity restrictions. Butter imports from Denmark for instance, were limited to 29 million Reichsmark in 1936.[75] The quota was subsequently raised to 40.1 million RM for the year 1937 and 52.3 million RM in 1938.[76] Germany furthermore granted special foreign exchange quotas for various Danish goods, mostly fish and seeds.[77]

In a confidential protocol for the trade treaty with Yugoslavia in 1934. Germany guaranteed the provision of import certificates for poultry, game

72. von Radiis, "Die deutsche Außenhandelspolitik unter dem Einfluß der Devisenbewirtschaftung von 1931 bis 1938," 127.

73. "Protokoll zu dem deutsch–dänischen Abkommen über den gegenseitigen Warenverkehr vom 1. März 1934", Political Archive of the German Foreign Office, BILATR DAN 037

74. See, for instance, "Protokoll über den deutsch-dänischen Warenverkehr vom 30. Januar 1936", "Protokoll über den deutsch-dänischen Warenverkehr im Jahre 1937 vom 23. Dezember 1936", Political Archive of the German Foreign Office, BILATR DAN 037

75. "Protokoll über den deutsch-dänischen Warenverkehr vom 30. Januar 1936", 12

76. "Protokoll über den deutsch-dänischen Warenverkehr im Jahre 1937", Political Archive of the German Foreign Office, BILATR DAN 037, 7; "Protokoll über den deutsch-dänischen Warenverkehr im Jahre 1938 vom 27. November 1937, Political Archive of the German Foreign Office, BILATR DAN 037, 6

77. "Protokoll über den deutsch-dänischen Warenverkehr vom 30. Januar 1936", 10

meat, chicken eggs, lard, and maize.[78] Germany also provided an import quota for 2,500 tonnes of lard and promised to help sell 50,000 tonnes of Yugoslavian wheat on the world market. The German government brokered a contract between the German oil seed industry and Yugoslavian producers for the purchase of 20,000 tonnes of linseed (tariff no. 15).[79] Wheat (tariff no. 2), maize (7), beans (11), linseed (15), tobacco (29), grapes (45), apples and plums (47-49), geese (107), other poultry (110-111), lard (127), egg yolk (137), egg white (138), and ferrosilicon (317O) imports to Germany, up to a specified quota limit, received special financial support from the German government to offset the sale of these goods at an unprofitable price.[80] In 1936, a new secret protocol expanded the import quotas and added quotas for live pigs (140,000 animals), cattle (30,000), and butter (120 tonnes) to the list.[81]

A trade treaty with Romania from 1935 also included provisions for tariff preferences and guarantees of foreign exchange supply for imports.[82] Import certificates were granted for chicken eggs (equivalent to the 1934 trade volume), lard (1,000 tonnes), live cattle (6,000 animals), and intestines (equivalent to the 1934 volume). Foreign exchange was made available for imports of barley (4 mill. RM), maize (8), beans, peas and lentils (2), oil fruit (5), red clover seed (0.5), nuts (2.7), timber (6), chicken (5), pork liver (0.3), wool (0.2), feathers (1), fur (2), fodder (4.4), copper (0.5), and various chemicals (0.5).

In a secret agreement with Hungary, Germany guaranteed the import of quotas of, among others, wheat, barley, maize, butter, cheese, eggs, and

78. "Vertrauliches Protokoll über das deutsche Uebernahmescheinverfahren", 1ff.; "Vertrauliches Schlussprotokoll zu dem Handelsvertrag zwischen dem Deutschen Reich und dem Königreich Jugoslawien und zu der Vereinbarung über die Förderung des deutsch-jugoslawischen Warenverkehrs", 1ff. Political Archive of the German Foreign Office, BILATR JUG 009.

79. ibid., 3.

80. "Liste zu der Vereinbarung über die Förderung des deutsch-jugoslawischen Warenverkehrs", Political Archive of the German Foreign Office, BILATR JUG 009.

81. "Anlage zum Geheimen Protokoll vom 1. April 1936", Political Archive of the German Foreign Office, BILATR JUG 009.

82. "Geheimes Protokoll zu der Vereinbarung über den deutsch-rumänischen Warenverkehr", Political Archive of the German Foreign Office, BILATR RUM 09, 33ff.

various types of meat from 1934 onwards[83][84] Germany furthermore paid export subsidies to the Hungarian exporters via an agreement with the Hungarian government, which effectively resulted in preferential tariff rates. Subsidies were set in Hungarian Pengo per 100 kilogrammes. For instance, the subsidy for barley imports for the purposes of feeding livestock – up to a maximum quota of 75,000 tonnes – was set at 3.70 Pengo per 100 kg in 1938.[85] The exchange rate at the time was 0.49 Reichsmark per Pengo and the specific tariff on barley was 18 Reichsmark per 100 kg.[86] The effective tariff paid by Hungarian exporters after accounting for subsidies was therefore 16.18 RM, a discount of approximately 10 %.

Once Germany ended its trade war with Poland in 1934, the two countries also came to secret agreements about bilateral trade. In a secret protocol from 1935, Germany agreed to allow the import of 20,000 tonnes of live or slaughtered pigs, 1,5 million Polish geese, 4,000 tonnes each of Polish butter and lard and 3,000 tonnes of eggs between November 1935 and October 1936. Germany furthermore granted a preferential tariff of 6 Reichsmark on Polish barley and oats, 8 Reichsmark for Polish peas and further concessions were made for the import of timber and liquor.[87]

Not all special import provisions were kept secret. Germany's most important source of sodium nitrate, an important chemical fertilizer, was Chile (hence its alternative name: Chile saltpetre). In a series of diplomatic

83. "Vereinbarung über die Förderung des deutsch-ungarischen Warenverkehrs", "Geheimer Notenwechsel über die Förderung des Warenverkehrs", Political Archive of the German Foreign Office, BILATR UNG 010

84. "Geheimes Protokoll", Political Archive of the German Foreign Office, BILATR UNG 010.

85. "Anlage A zu der Zusatzvereinbarung zu der Vereinbarung über die Förderung des deutsch-ungarischen Warenverkehrs vom 6. Juli 1937", Political Archive of the German Foreign Office, BILATR UNG 010

86. The exchange rate is calculated based on data from Global Financial Data.

87. "Protokoll über die Einfuhr einiger landwirtschaftlicher Erzeugnisse aus dem polnischen Zollgebiet in das deutsche Zollgebiet", Political Archive of the German Foreign Office, BILATR POL 112, Polen 122, 25ff. See also the extension in 1937: "Warenabkommen zwischen dem Deutschen Reich und der Republik Polen", Political Archive of the German Foreign Office, BILATR POL 112, Polen 125.

exchanges beginning in 1932, Germany provided a special quota of foreign exchange for the import of Chilean sodium nitrate. Austria, meanwhile, was granted special import quotas for timber. In 1935, Germany came to an agreement with France that provided for the import of various animal products at a zero tariff rate.[88]

Trade treaties and preferential treatment provisions are included in the model through two variables: one dummy variable that indicates if a country had a trade treaty with Germany in place and one variety-specific variable that indicates if a special provision was made for the import of a variety through trade treaties or secret appendices to them.[89] Where a treaty changes a tariff rate, this is reflected directly in the tariff variable.

6.3.3 Clearing Agreements

With rigid exchange controls in place, the German government needed to find a way to maintain trade flows. Beginning in 1931, Germany entered a series of clearing agreements with most of its trading partners which made it possible to conduct foreign trade without reliance on foreign exchange. In the case of the Balkan countries, the Nazi government used these agreements to tie these countries closer to Germany economically.[90] These clearing agreements sometimes included provisions for preferential treatment of certain goods. In the clearing agreement with the United Kingdom (in force from 1 November, 1934), for example, the list of preferred goods included coal, coke, yarn, textiles and fish.[91] A clearing agreement with France from 28 July 1937

88. "Zusatzabkommen zur Vereinbarung über den deutsch-französischen Warenverkehr vom 28. Juli 1934"', Political Archive of the German Foreign Office, BILATR FRA 102, Frankreich 107

89. As mentioned in a previous chapter, a variety is a particular good from a particular country, such as French coal (as opposed to just coal, which is a good).

90. United States Tariff Commission, *Foreign-trade and exchange controls in Germany: A report on the methods and policies of German foreign-trade control, with special reference to the period 1931 to 1939*, 170.

91. von Radiis, "Die deutsche Außenhandelspolitik unter dem Einfluß der Devisenbewirtschaftung von 1931 bis 1938," 86.

Table 6.1: Overview of trade treaties signed from 1929 to 1933

Country	Treaty Type	Date in force
Lithuania	Trade and Shipping Treaty	22 Feb 1929
Romania	Preliminary Trade Treaty	15 Jul 1930
Turkey	Trade Treaty	25 Sep 1930
Saudi Arabia	Treaty of Friendship	6 Nov 1930
Egypt	Preliminary Trade Treaty	19 Nov 1930
Panama	Trade and Shipping Treaty	2 Dec 1930
Persia	Trade, Tariff and Shipping Treaty	11 Jan 1931
Austria	Trade Treaty	2 Feb 1931
Haiti	Treaty of Friendship and Trade	7 May 1931
Irish Free State	Trade and Shipping Treaty	21 Dec 1931
Hungary	Trade Treaty	28 Dec 1931
Brazil	Treaty	4 Jan 1932
Switzerland	Economic Treaty	17 Nov 1932
Bulgaria	Trade and Shipping Treaty	17 Feb 1933
South Africa	Trade and Shipping Treaty	1 Mar 1933
Chile	Preliminary Trade Treaty	1 May 1933
Netherlands	Tariff Treaty	10 May 1933
Yugoslavia	Preliminary Trade Treaty	1 Aug 1933
Costa Rica	Trade Agreement	22 Nov 1933

specified the preferred treatment of various French raw materials and ores. It guaranteed the import of 7.2 million tonnes of iron ore, equal to 40 % of total iron ore imports in 1936.[92]

Friedman explains the theoretical implications of the clearing agreement in more detail: The imposition of bilateralism in the trade with Southeastern Europe effectively meant that imports and exports no longer had to balance across all trade partners but within the bilateral relationship.[93] The six countries in the region that are considered part of the Reichsmark Bloc – Hungary, Bulgaria, Yugoslavia, Romania, Greece, and Turkey – were also the ones that had "large-scale clearing agreements with Germany after

92. von Radiis, "Die deutsche Außenhandelspolitik unter dem Einfluß der Devisenbewirtschaftung von 1931 bis 1938," 89.

93. P. Friedman, "The welfare costs of bilateralism: German-Hungarian Trade, 1933-1938," *Explorations in Economic History* 13, no. 1 (1976): 119.

Table 6.2: Overview of trade treaties signed from 1934 to 1938

Country	Treaty Type	Date in force
Denmark	Agreement on bilateral trade	16 Mar 1934
Uruguay	Most favoured nation agreement	17 May 1934
Yugoslavia	Trade Treaty	1 Jun 1934
France	Treaty on Trade, Settlement and Shipping	1 Aug 1934
Estonia	Agremeent on bilateral trade	14 Jan 1935
Chile	Trade Treaty	1 Feb 1935
Romania	Treaty on Settlement Trade and Shipping	1 Apr 1935
Latvia	Agreement on bilateral trade	1 Jan 1936
Iraq	Trade Treaty	11 Jun 1936
Canada	Preliminary Trade Agreement	15 Nov 1936
Syria and Lebanon	Trade Agreement	1 Mar 1937
France	Treaty on bilateral trade	1 Aug 1937
Siam	Treaty of friendship, trade and shipping	26 Feb 1938
Ecuador	Trade Agreement	1 April 1938
Netherlands	Treaty on bilateral trade	1 Apr 1938
Lithuania	Agreement on bilateral trade	13 May 1938
Manchukuo	Treaty of Friendship	15 Jul 1938
Guatemala	Trade Agreement	11 Aug 1938
Poland	Economic Treaty	1 Sep 1938

1933."[94] Changes in joint trade volume, Friedman argues, were "extremely negative" and "the gains experienced by Germany in the form of lower relative commodity prices" after 1935 "were at the expense of her bilateral partner."[95]

Teichert[96] distinguishes between two different types of clearing agreements. The "eastern style" bank agreements were set up between the Reichsbank and the trading partners' central banks and covered the entirety of payments and capital flows entirely without the use of foreign exchange. The "western style" agreements between national governments were the

94. Ibid., 120.

95. Ibid., 123.

96. Teichert, *Autarkie und Großraumwirtschaft in Deutschland 1930-1939: Außenwirtschaftspolitische Konzeptionen zwischen Wirtschaftskrise und Zweitem Weltkrieg*, 32.

basis of the trading relationship with, for instance, Sweden and the United Kingdom. They were only used for the payment of imports and allowed for the use of foreign exchange but mandated a positive trade balance for Germany. The German government's hope was that it would acquire some much needed foreign exchange this way.

Clearing agreements are accounted for in the model in conjunction with the exchange control dummy variable (see section 6.3.7 below). Figure 6.2 provides an overview of all the clearing agreements and when they came into force.[97]

6.3.4 Compensation Agreements

Von Radiis also mentions two notable compensation agreements prior to the introduction of the New Plan in 1934, when Germany essentially engaged in barter trade with other countries. In 1932 the German and Brazilian government agreed to an exchange of Brazilian coffee against German coal.[98] This agreement turned out to be very successful in reviving trade with Latin America, which had collapsed in previous years. Furthermore, on 22 September 1932, an agreement with the Egyptian government facilitated the import of Egyptian cotton.[99] Both agreements are also mentioned by Child[100] Deals like these made it possible to outmanoeuvre the most favoured nation clause and grant specific countries additional import quotas. The Brazilian coffee quota, for instance, did not actually raise overall coffee imports to Germany, but shifted imports out of countries, with whom Germany had a passive trade balance, to Brazil.

97. Reichswirtschaftsministerium, *Übersicht über den Stand der wirtschaftspolitischen Beziehungen Deutschlands*, 1928–1938.

98. von Radiis, "Die deutsche Außenhandelspolitik unter dem Einfluß der Devisenbewirtschaftung von 1931 bis 1938," 95.

99. C. Dawletschin-Linder, *Die Türkei und Ägypten in der Weltwirtschaftskrise 1929-1933*, Studien zur modernen Geschichte (F. Steiner, 1989), 90.

100. Child, *The Theory and Practice of Exchange Control in Germany: A Study of Monopolistic Exploitation in International Markets*, 32.

Figure 6.2: Clearing agreements of the German *Reich*

Source: Reichswirtschaftsministerium (1931-38)

These compensation agreements are included in the model as a dummy variable that is switched on if a compensation agreement was in place for the import of a good from a country in a given year.

6.3.5 Import Bans

Various goods fell under an import ban starting in December 1925. These goods, mostly chemical raw materials and plants, were *de facto* still imported but required special permission to be imported into the German Reich. The economically most noteworthy of these goods are the goods in tariff category 238, that encompassed different types of coal.[101]

Since the import bans for the goods in my sample did not vary over time, any inclusion of an import ban variable in the model would drop out due to collinearity with the fixed effects. They should be controlled for through these fixed effects but are not explicitly depicted in the results.

6.3.6 Quotas

Quotas did not play a major role in German trade policy prior to the Great Depression. Only two significant quota arrangements existed: A coal quota for trade with the United Kingdom and a butter quota for all countries with most favored nation status based on the trade treaty with Finland. The latter allowed the import of 5000 tonnes of butter at a reduced tariff rate 50 Reichsmark below the regular rate. This meant that, depending on the source country, and in combination with the *Obertarif* and the devaluation surcharge, five different tariff rates applied to butter imports.

The coal quota is included in the model as a dummy variable that is 1 for British coal in years when the quota was in effect. The butter quota is reflected directly in the tariff variable.

6.3.7 Exchange Controls

The German government first introduced exchange controls in July 1931 with six temporary decrees, before the system was codified in the First Devisen

101. O. Lang, *Zollhandbuch für das Deutsche Reich* (Berlin: Reimar Hobbing, 1925–1939), 28.

Law on 1 August.[102] The *Devisenstellen*, agencies in charge of allocating foreign exchange, divided all imported goods into three categories: essential goods, for which unlimited foreign exchange was to be allocated; goods necessary in a limited scope, for which up to 10,000 Reichsmark could be allocated; and unnecessary luxury goods, for which no foreign exchange was allocated. This system was abolished in October. The German government allocated foreign exchange to importers on the basis of the import volume in the quarter one year before.[103] This quota was then subsequently lowered, first by 25 % in December 1931, then in steps of 5 or 10 percentage points until it reached 50 % in May 1932. It remained at this level until March 1934, when it was again reduced in monthly steps down to 10 % in June 1934.[104]

According to Doering, this system was neither initially intended to reduce imports nor did it have such an effect during the years of the Depression[105] and Child argues that "there is little evidence that control was used as an instrument of trade policy."[106] From 1934 onwards, however, the National Socialist government used exchange controls as a means to reduce imports by gradually lowering the quotas allocated to importers.[107]

The exchange controls only remained good-specific for a few months in 1931 and are otherwise applied across all countries and goods, which means that there is no way to include them in the model that is not collinear with the fixed effects. This unfortunately means that the exchange controls cannot be fully reflected in the results, which should therefore be seen as a conservative

102. Ellis, "German Exchange Control, 1931-1939: From an Emergency Measure to a Totalitarian Institution," 9.

103. D. Doering, *Deutsche Außenwirtschaftspolitik 1933-1935: die Gleichschaltung der Außenwirtschaft in der Frühphase des nationalsozialistischen Regimes* (Photo copie W. Hilke Kg., 1969), 59.

104. M. Ebi, *Export um jeden Preis: die Deutsche Exportförderung von 1932-1938* (Steiner, 2004), 23.

105. Doering, *Deutsche Außenwirtschaftspolitik 1933-1935: die Gleichschaltung der Außenwirtschaft in der Frühphase des nationalsozialistischen Regimes*, 58.

106. Child, *The Theory and Practice of Exchange Control in Germany: A Study of Monopolistic Exploitation in International Markets*, 25.

107. Doering, *Deutsche Außenwirtschaftspolitik 1933-1935: die Gleichschaltung der Außenwirtschaft in der Frühphase des nationalsozialistischen Regimes*, 65.

estimate of the impact of trade policy. Any impact that goes beyond the one of tariffs, quotas and treaties is likely the result of such exchange controls. As previously mentioned, I do control for exchange controls by exploiting the existence of clearing agreements in the 1930s. I use a dummy variable that gets switched on when exchange controls are introduced and which gets switched off again if a country signs a clearing agreement with Germany. This should capture at least some of the impact of the exchange controls because clearing agreements removed the need for foreign exchange (although they were far from the free trade conditions of the 1920s). The inclusion of clearing agreements offers at least some insights into the extent to which barter trade, which circumvented the need for foreign exchange, alleviated the restrictions.

6.3.8 Cartels

Germany was a member in a large number of international cartels. As Schröter explains, sectors that produced non-differentiated, capital-intensive goods, primarily the chemical and heavy industry, were particularly cartelised.[108] I need to account for the possibility that imports of a good from a specific country were lower than supply and demand would dictate, because Germany was in a cartel with the trading partner for this specific good. I provide a list of all cartels included in the appendix. The list is largely based on that by Suslow,[109] amended with the International Petroleum Cartel (see, for instance, Federal Trade Commission[110]) The cartels are included in the model as a variety-specific dummy variable.

108. V. Schröter, *Die deutsche Industrie auf dem Weltmarkt 1929 bis 1933: außenwirtschaftliche Strategien unter dem Druck der Weltwirtschaftskrise*, 03 (P. Lang, 1984), 291.

109. V. Y. Suslow, "Cartel contract duration: empirical evidence from inter-war international cartels," *Industrial and Corporate Change* 14, no. 5 (2005): 705–744.

110. Federal Trade Commission, *The International Petroleum Cartel* (1952).

6.4 Data

6.4.1 Trade

The trade data that I use to estimate the elasticities and calibrate the model are 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.[111] I am using a sample of 586 products from 50 trade partners across a period of 14 years, starting in 1925 to avoid the hyperinflation years and the time of the "hole in the West", the open border in the French-occupied territory that made compiling accurate trade statistics impossible, and ending in 1938 before the outbreak of World War II. 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 530 consistent product categories. Wherever this resulted in more disaggregated categories in the tariff than in the trade data, I used the unweighted average tariff rate across all goods in the respective category. The result is a data set of 530x50x14=371,000 observations, most of which have an import value of zero.

The statistical volumes record both the trade volume in *Doppelzentner*, equal to 100 kg, and the value in 1,000 Reichsmark. The availability of both volumes and values allowed me to construct unit values at the product level, which in turn enabled me to construct ad valorem equivalent tariff rates for all traded goods. The data would also allow me to construct unit values at the country-good level, which would allow for more variation and give a more precise estimate of the country-specific tariff rate. However, country-specific

111. Statistisches Reichsamt, *Der Auswärtige Handel Deutschlands in den Jahren 1925-27*; Statistisches Reichsamt, *Der Auswärtige Handel Deutschlands im Jahr 1929*; Statistisches Reichsamt, *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember*.

unit values are correlated with distance and therefore endogenous. I therefore report results based on unit values for the whole product category here. Using the country-specific rates leads to similar results in the model simulations.

The chosen countries include the most important import sources for Germany throughout the interwar period. While they were picked based on their share of total world trade, they include all of Germany's top 20 import source countries and 26 of the top 30 in the year 1927. They also include, among others, the most important trading partners in Africa (South Africa and Egypt), the Americas (Argentina, Brazil, Chile, Canada, and the United States) and Asia (British India, Dutch East Indies, Japan, and China) according to Höpfner.[112] Tables D.3 to D.5 in the appendix provide a breakdown of the most important goods and countries over time in the sample.

6.4.2 Tariffs

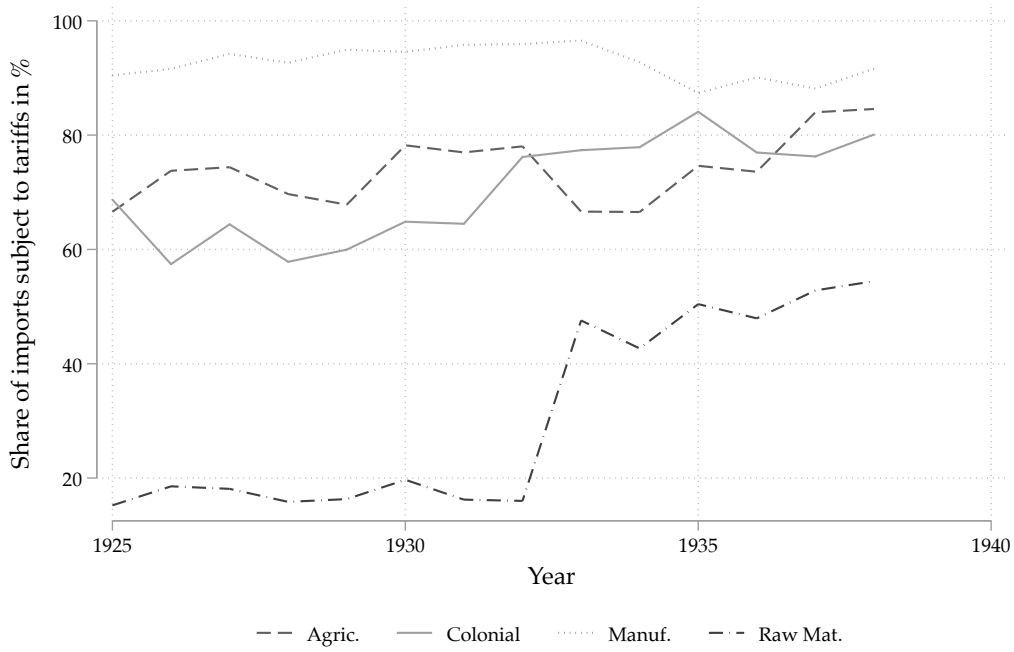
I have reconstructed tariffs for the entire sample of goods based on the official German legislative publication, the *Reichsgesetzblatt*, amended with information from the *Tariff Handbook for the German Reich*.[113] I began by typing up the tariffs listed in the first edition of the Tariff Handbook, published in 1925. I then checked all publications of the *Reichsgesetzblatt* between 1925 and 1938 for tariff changes and adjusted the tariff rates accordingly, 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 a tariff change. I also adjusted rates for the application of the *Obertarif*, the loss of MFN status, and the application of value compensation tariffs.

112. B. Höpfner, *Der deutsche Außenhandel, 1900-1945: Änderungen in der Waren- und Regionalstruktur*, 05] (Lang, 1993), 26.

113. Reichsministerium des Innern, ed., *Reichsgesetzblatt*, 1925–1939; Lang, *Zollhandbuch für das Deutsche Reich*.

Figure 6.3 shows the share of German imports in my sample that was subject to tariffs over time, separated into four broad categories. Figure 6.4 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. Because of the different order of magnitude, I separate the time series for colonial goods and plot it in figure 6.5 The graphs show that agricultural and colonial goods were subject to especially high tariff increases during the Great Depression, but tariffs on raw materials and manufactured goods also increased over the course of the 1930s. The unweighted tariff on agricultural goods in my sample almost reached 100 % at its peak in 1935, while the rate on colonial goods peaked at 7000 % in 1933.[114]

Figure 6.3: Share of German imports subject to tariffs



114. I am using unweighted rather than weighted averages here as recommended by Anderson and Neary ("Measuring the restrictiveness of international trade policy"). Trade-weighted averages do not account for endogeneity (higher tariffs for one category of goods lead to a lower import value and therefore a lower weight for this category) and are therefore subject to bias.

Figure 6.4: Unweighted average ad valorem equivalent tariff rate for non-colonial goods

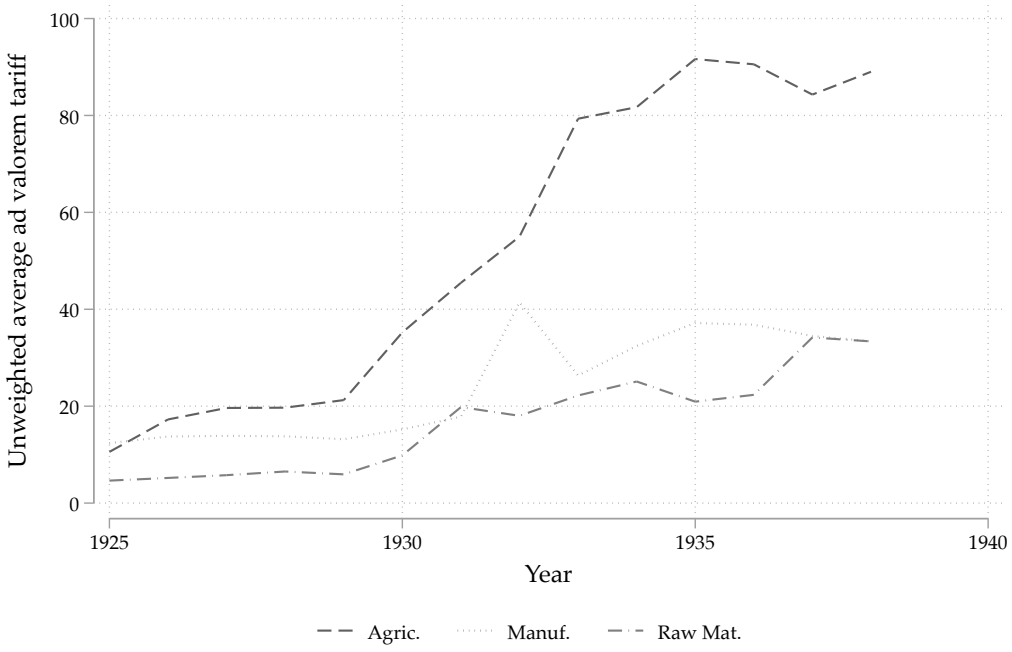
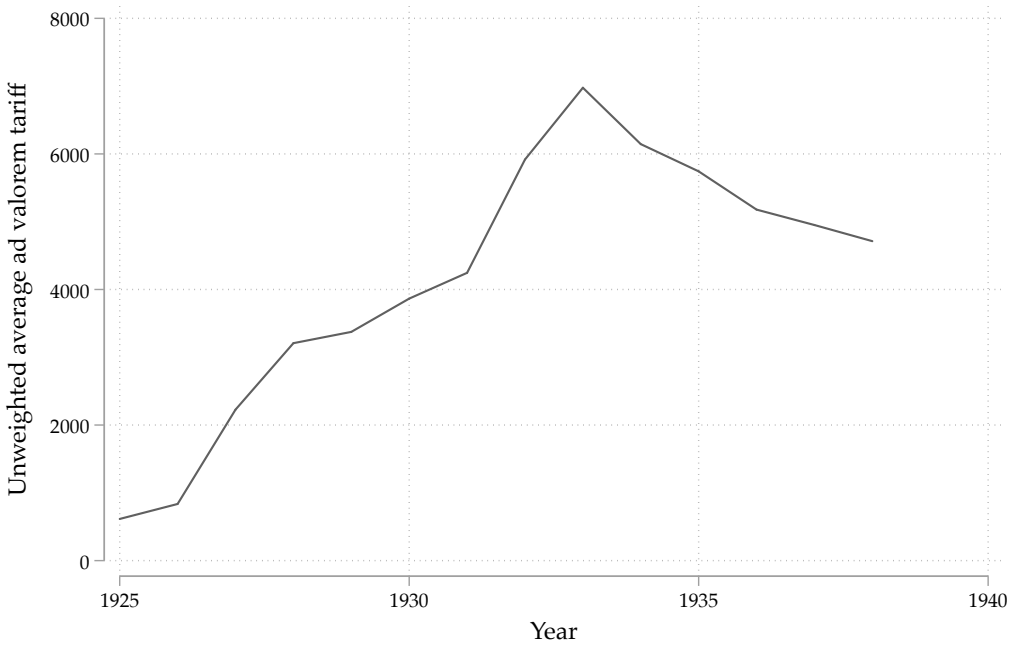


Figure 6.5: Unweighted average ad valorem equivalent tariff rate for colonial goods



Since Germany set almost all tariffs at specific rates rather than *ad valorem*, the rising *ad valorem* equivalent tariff is the result of two causes: legislative increases of the specific tariff signed into law by the German government and the deflation in unit values resulting from globally falling prices during the Great Depression. The government could have changed specific tariffs in a countercyclical way to offset the deflation and reduce volatility of the relative tariffs. However, the data show that this is not what happened: The German government used the deflation's protectionist impact and additionally raised specific tariffs in the deflation years. I can split the two causes by freezing unit values in the year 1925 and then calculating hypothetical *ad valorem* rates for subsequent years based on these unit values. I plot the unweighted mean of year-on-year log changes for the tariff rate along with the hypothetical legislation-only tariff changes as well as the difference between the two – that is, the price effect – in figure 6.6. The effect of price declines exceeds that of legislation between 1930 and 1933, the years of the most extreme tariff hikes. In 1931, 86.81 % of the effective tariff rate increase is the result of deflation, only 13.19 that of legislation. By 1934, deflation had slowed down enough that legislation began to be more important, with 59.55 % of the rate increase being the result of legislation. Figure 6.7 breaks the relationship between price and legislative changes down by the nine broad categories used in the remainder of the chapter (see below). For several categories and years, the entire increase in the effective tariff is due to price changes: miscellaneous industrial goods between 1931 and 1936; food oils from 1929 to 1931 and 1937 to 1938; colonial goods in 1927 and from 1935 to 1938; and textiles in 1931, 1936 and 1938. Conversely, the price of grain was increasing again in 1934 and 1935 by such a high margin that the effective tariff rate fell despite an increase in the specific tariff. The same is true of minerals in 1936 and 1937 and machinery in 1934, 1937, and 1938. In the subsequent analysis, whereever I talk about the effect of rising tariffs and

increasing protectionism, this effect includes that of the protectionism of omission which resulted from price deflation.

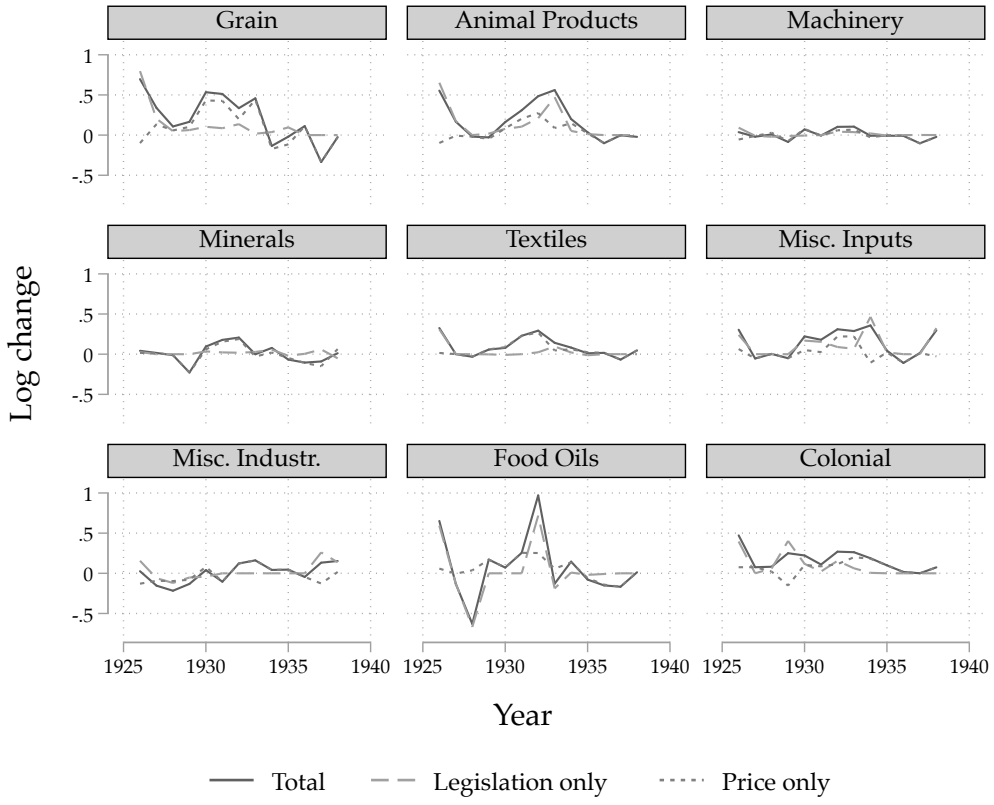
Figure 6.6: Price and Legislation Effect on Tariffs

6.4.3 Non-Tariff Barriers to Trade

I have constructed controls for non-tariff barriers to trade based on the trade treaties published in the *Reichsgesetzblatt*, secret, un-published appendices to treaties held in the Political Archive of the German Foreign Office, and secondary literature.

I control for trade treaties with two dummy variables: One variable, TreatyCountry, takes the value 1 if a trade treaty with the country was in force in the specific year and 0 otherwise. The other, TreatyGood, is 1 if a special provision for imports of a given good are made in a treaty or in the secret appendices to a treaty, and 0 otherwise. While the Treaty*Country variable only varies by good and year (it gets switched on when a new trade treaty is signed with a previously treaty-less trade partner), the TreatyGood variable

Figure 6.7: Price and Legislation Effect on Tariffs by Product Category



can vary by all three dimensions, year, country, and good. I also control for the existence of the presence of exchange controls and the existence of clearing agreements between the German government or central bank and the trade partner with a dummy variable that is 1 after exchange controls are introduced and where there is no clearing agreement in place.

I include the butter quota directly by adjusting the tariff rate[115] and include a dummy variable *quota* for the British coal quota that is 1 in the years 1932 and beyond for coal imports from the United Kingdom.

I control for cartels with a dummy variable $cartel_{cgt}$ that is 1 if a cartel agreement existed for good g in year t and both Germany and the trading partner c were members of this agreement.

115. I set the tariff for butter imports to 50 for all imports from countries within the quota and to $\frac{50*5000+100*(x-5000)}{x}$ for all that exceed it, where x is the trade volume in tonnes.

I code up the two previously mentioned compensation agreements as a dummy variable that is 1 for Egyptian cotton and Brazilian coffee in the years 1932 and 1933, the period over which the imports occurred.

I also control for trade partners' GDP (which I get from de Bromhead et al.[116][117]) and Reichsmark exchange rates, which I calculate based on data from *Global Financial Data*.

6.5 CGE Modeling

I employ a Computable General Equilibrium (CGE) model to estimate counterfactual trade flows based on a fixed 1929 trade policy regime. CGE models are widely used by both academic economists and practitioners such as political consultants, NGOs and government agencies to analyze the impact of public policy measures. A CGE model is "a system of equations that describes an economy as a whole and the interactions among its parts."[118] These equations are derived from economic theory similar to the equations describing supply and demand in a simpler, partial-equilibrium model. They "describe producer and consumer behavior and impose market-clearing constraints, and they are solved for the set of prices at which the quantities of supply and demand are in equilibrium in all markets."[119] The model solves all these equations at the same time based on a provided data set. It depicts a general equilibrium because, in the case of trade policy, it not only accounts

116. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection."

117. Since de Bromhead et al. investigate trade with the United Kingdom, their GDP data do not include the UK itself. I therefore added data for the UK and also for Bulgaria and Greece, two important trade partners of Germany that are missing from their data, using the same approach, that is, adjusting data from Klasing and Milionis ("Quantifying the evolution of world trade, 1870–1949") with the adjustment coefficients from Broadberry and Klein ("Aggregate and per capita GDP in Europe, 1870–2000: continental, regional and national data with changing boundaries")

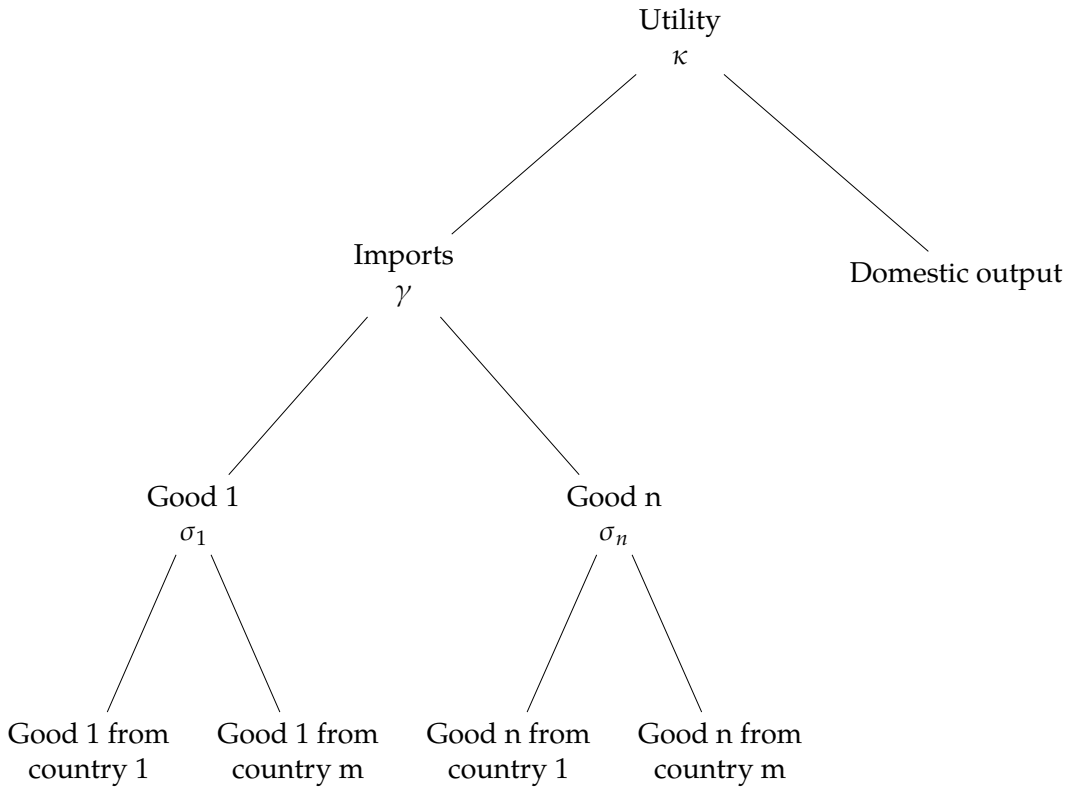
118. M. Burfisher, *Introduction to Computable General Equilibrium Models* (Cambridge University Press, 2017), 10.

119. Ibid., 19.

for shifts in supply and demand for one particular variety, but can take into account interconnections between separate markets. If tariffs on Polish rye get raised, this does not just lead to a rise in rye prices and a decrease in demand for Polish rye. It also has an impact on, for instance, other goods (demand might shift towards importing more wheat instead of rye) or rye imported from other countries (since rye is a relatively homogenous good, demand might shift towards American rye, which has now become cheaper in relative terms). The domestic consumers might also decide that they want to import less in general and rather spend their money on domestic goods. Demand for domestic rye (or other goods) would then increase and total imports would fall, a shock that could possibly be spread out across all imported varieties. We also do not know the magnitude of these effects if we do not take into account interdependencies between the different markets: An increase in prices caused by one factor (such as a tariff increase) may be partially offset by a decrease in prices due to another (such as demand shifting to another import source as a result of the tariff). For all of these reasons, simply looking at the drop in demand for each variety in an isolated, partial-equilibrium model would give us a biased impression of the impact of a tariff increase and ignore the complexities of the real economy.

A CGE model is "calibrated" under the assumption that the economy is in equilibrium, meaning that consumers are maximizing their personal utility and producers are maximizing profit. The calibration yields initial values for the variables of interest that are then used as a benchmark. The model then allows me to introduce an exogenous shock to push the economy out of this benchmark equilibrium – in the case of the model in this chapter, a counterfactual change in the tariff rates and other trade policy measures – after which running the model allows us to simulate how the model iteratively returns to an equilibrium state with new values for all our variables of interest.

Figure 6.8: Nested utility function



6.6 Theoretical Framework

The model of this chapter builds upon the work on varieties in international trade by Broda and Weinstein.[120] A variety, as Broda and Weinstein define it, is the "production of a particular good in a particular country."[121] I use the term *variety* in accordance with this definition, in contrast to the term *good*, which I use to describe everything within a category of German imports at the lowest available level of aggregation that is consistent over time, regardless of the source country. For instance, rye (tariff number 1) and automobiles (tariff number 915a) are goods, whereas Polish rye and American automobiles are varieties. Polish rye and American rye are varieties of the same good. This definition allows me to think of the structure of German imports at three

120. C. Broda and D. E. Weinstein, "Globalization and the Gains From Variety*," *The Quarterly Journal of Economics* 121, no. 2 (May 2006): 543.
121. Ibid., 548.

levels corresponding to three sets of elasticities: at the level of total imports, the imports of goods, and the imports of varieties. Consumers do not only have a preference for a mix of goods, but also for a mix of varieties, and the substitutability of two varieties can be seen from the elasticity of substitution between them. If the elasticity is high, the level of differentiation is relatively low and consumers are happy to substitute imports from one country for those from another. Their decision is primarily based on the price. If, on the other hand, the elasticity is low, consumers are less willing to shift from one variety to another. They may, for instance, have a preference for American cars over British cars, even if the former were slightly more expensive.[122] Elasticities are essential in understanding the response of trade to policy shocks

The framework I use assumes constant elasticity of substitution (CES). This is a somewhat simplifying assumption about the way in which the presence of varieties affect consumer welfare and therefore influence demand. As Broda and Weinstein explain, CES models are widely used and lend themselves more easily to the construction of aggregate price indices than other types. The assumption of CES is also empirically more feasible than more complex assumptions about the structure of demand due to the limitations of available data.[123][124]

I define the equations in the following based on the notation of Broda and Weinstein.[125] Figure 6.8 illustrates the functional structure of the nested utility function on the demand side in three steps.[126] The framework is based

122. Ibid., 549.

123. Ibid., 547.

124. Burfisher (*Introduction to Computable General Equilibrium Models*, 102) also discusses the advantages and disadvantages of different utility functions in CGE models. The "simplest (but most restrictive)" option is the Cobb-Douglas utility function, which assigns an own price elasticity of -1 and an elasticity of substitution of 1. The implication is that budget shares remain constant with changing relative prices. A CES utility function, in contrast, allows budget shares to flexibly respond to relative price changes. I report the results of the CES-based simulation in the results section, but subsequently also report robustness check results from a Cobb-Douglas function.

125. Broda and Weinstein, "Globalization and the Gains From Variety*."

126. This is based on the illustration of the same framework by de Bromhead et al. ("When Britain turned inward: the impact of interwar British protection")

on a nested constant elasticity of substitution (CES) utility function. One representative domestic consumer[127] is assumed to maximize their utility within given budget constraints. The budget constraint is given by Germany's gross domestic product for a given year.[128] The domestic consumer makes three decisions in this model: first of all, whether and to which extent to import or consume a domestic good. Utility U_t at time t is based on consumption of domestic good D_t and imported good M_t. The relationship between these variables is defined by the consumer's utility function:

$$U_t = \left(\alpha_{D_t} D_t^{(\kappa-1)/\kappa} + (1-\alpha_{Dt}) M_t^{(\kappa-1)/\kappa}\right)^{\kappa/(\kappa-1)} \tag{6.1}$$

κ is the elasticity of substitution between importing and consuming domestic goods. The higher κ is, the more a consumer will shift from imports to domestically produced goods if the relative price of imported goods increases, and vice versa. M_t is in this case the total bundle of imported goods from all countries and in all categories.

Secondly, the consumer has a choice between different imported goods to consume. M_t 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:

$$M_t = \left(\sum_{g \in G_t} \alpha_{gt} M_{gt}^{(\gamma-1)/\gamma}\right)^{\gamma/(\gamma-1)}, \tag{6.2}$$

where M_{gt} are the total imports of good g in year t. 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

127. A model simplification that aggregates all individual consumers into one without affecting the results.

128. The GDP is adjusted downwards in the model because we do not use the universe of imports but only a sample. The ratio between the adjusted GDP and the total value of the import sample is equal to the nominal GDP and the total imports in a given year to accurately reflect what share of GDP goes into imports. The representative agent additionally gets the tariff revenue accumulated by the government and can spend it on further consumption.

$I_{gt} \subset C$ of countries supplying good g to Germany in year t. In a third step I can therefore define M_{gt} as

$$M_{gt} = \left(\sum_{c \in I_{gt}} \beta_{gct} m_{gct}^{(\sigma_g - 1)/\sigma_g} \right)^{\sigma_g/(\sigma_g - 1)}, \tag{6.3}$$

where m_{gct} are the imports of good g from country c in period t. σ_g is the elasticity of substitution between two different varieties of the same product category from different countries.

These three functions together define the demand side of the framework. The supply side is based on a model by Anderson and Neary:[129] It is a one factor, two goods model, in which a representative producer maximizes profits by choosing between producing exports X_t or domestic output D_t. Similarly to the CES form of the demand side, the production function assumes a constant elasticity of transformation η:

$$GDP_t = \left(\alpha^D D_t^{(1+\eta)/\eta} + (1 - \alpha^D) X_t^{(1+\eta)/\eta} \right)^{\eta/(1+\eta)} \tag{6.4}$$

If the absolute value of η is high, production is highly elastic and the producer will react more strongly to a change in relative prices. α^D is the domestic output's share of GDP under the benchmark conditions.

Now, the protectionist measures will have an impact on prices in Germany. World prices are assumed to be given with Germany as a price-taker rather than a country with sufficient market power to influence prices. Prices in Germany will then be the world prices (p_{gct}^W) multiplied by a policy-based trade cost factor τ_{gct}, that is country- and product-specific and changes over time as trade policy becomes more restrictive. For instance, if the *ad valorem* tariff on wheat from Poland is 20 % and there are no other non-tariff trade

129. J. E. Anderson and J. P. Neary, "A New Approach to Evaluating Trade Policy," *The Review of Economic Studies* 63, no. 1 (January 1996): 107–125.

barriers imposed, then the value of τ for this variety would be 1.2. The price of a good g from country c in year t is then:

$$p^D_{gct} = \tau_{gct} \times p^W_{gct} \tag{6.5}$$

The trade cost parameter can be further defined to allow for different policy measures at the same time as

$$\tau_{gct} = \left(\prod_{i=1}^{n} b_i^{\delta_{igct}} \right) \times (1 + t_{gct}). \tag{6.6}$$

The product term in this equation defines ad valorem equivalents of each non-tariff barrier i. δ_{igct} is a dummy variable that takes the values 1 or 0 based on whether a specific policy i is active for a given variety in a given year. The second half of the equation includes the actual ad valorem tariff t_{gct}. Both the tariff and non-tariff barriers get multiplied to reach the total policy-based trade cost of τ_{gct}. For instance, in the above example of a 20 % tariff on Polish wheat, if there were also a quantitative restriction in place that reduced imports of Polish wheat by an amount equivalent to a 10 % tariff, this would increase the trade cost parameter by a further 10 %, so that $\tau_{gct} = (1.1) \times (1 + 0.2) = 1.32$.

In order to simulate the model, I need trade data at the country-commodity-year level, which I get from the German trade statistics, and the elasticities: σ_g for each of the 530 goods, γ, and κ, which I will estimate based on the data, as well as η. I need σ_g and γ to determine the impact of protectionism on the share of imports coming from the Reichsmark bloc. In addition to the σ_gs, κ and η are used to estimate the impact of protectionism on the total value of German imports.

6.6.1 Estimating the σ_gs

Deriving the Regression Equations

Further following the approach and notation of de Bromhead et al.,[130] I can use the structural gravity equations from Anderson and Yotov[131] to estimate the elasticities of substitution for the choice between goods from different countries, the σ_g for each of our 530 goods. This gives me:

$$V^D_{gct} = \frac{M_{gt} \times Y_{gct}}{Y_{gt}} \times \left(\frac{\tau_{gct}}{P_{gt} \times \Pi_{gct}} \right)^{1-\sigma_g} \tag{6.7}$$

V^D_{gct} is the value of imports of good g from country c in year t, measured in German domestic prices, that is, the import volume m_{gct}, multiplied by the domestic price p^D_{gct}. Combining this with equation 6.5 I can express this as $V^D_{gct} = p^D_{gct} \times m_{gct} = \tau_{gct} \times p^W_{gct} \times m_{gct}$. Y_{gct} is the total output of good g in country c in year t and Y_{gt} is the output of the same good in the whole world. P_{gt} and Π_{gct} are both multilateral resistance terms. P_{gt} is the inward multilateral resistance term of Germany and includes barriers facing imports to Germany for good g and time t, whereas Π_{gct} describes the outward multilateral resistance terms of Germany's trade partners and includes the barriers facing exports of good g at time t from country c.[132]

I can now rearrange this equation to get values at world prices V^W_{gct} instead of domestic prices (V^D_{gct}) by dividing by the policy cost parameter τ_{gct}:

130. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection."

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

132. J. E. Anderson and E. Van Wincoop, "Gravity with gravitas: a solution to the border puzzle," *American economic review* 93, no. 1 (2003): 170–192.

$$V_{gct}^{W} = V_{gct}^{D}/\tau_{gct} = \frac{M_{gt} \times Y_{gct}}{Y_{gt}} \times \left(\frac{\tau_{gct}}{P_{gt} \times \Pi_{gct}}\right)^{1-\sigma_g} \times \tau_{gct}^{-1}$$
$$= \frac{M_{gt} \times Y_{gct}}{Y_{gt}} \times \tau_{gct}^{-\sigma_g} \times \left(\frac{1}{P_{gt} \times \Pi_{gct}}\right)^{1-\sigma_g} \quad (6.8)$$

Since I previously defined τ_{gct} in equation 6.6, I can substitute it:

$$V_{gct}^{W} = \frac{M_{gt} \times Y_{gct}}{Y_{gt}} \times \left(\left(\prod_{i=1}^{n} b_i^{\delta_{igct}}\right) \times (1 + t_{gct})\right)^{-\sigma_g} \times \left(\frac{1}{P_{gt} \times \Pi_{gct}}\right)^{1-\sigma_g} \quad (6.9)$$

Finally I can take logs of everything to get:

$$\ln(V_{gct}^{W}) = \ln(M_{gt}) + \ln(Y_{gct}) - \ln(Y_{gt}) - \sigma_g \sum_{i=1}^{n} \ln(b_i)\delta_{igct}$$
$$- \sigma_g ln(1 + t_{gct}) - (1 - \sigma_g)\ln(P_{gt}) - (1 - \sigma_g)\ln(\Pi_{gct})^{1-\sigma_g} + u_{gct} \quad (6.10)$$

with the error term u_{gct}.

This brings me closer to an equation that I can use in a regression framework. I have data for V_{gct}^{W} from the German trade statistics and I have also collected data for the trade policy variables t_{gct} and δ_{icgt} with the former constructed as ad valorem rates based on the published specific tariffs and the unit values from the trade statistics and the latter constructed from various non-tariff barriers described in section 6.4.3. I do not have data for M_{gt}, Y_{gt} and P_{gt}, but including good times year fixed effects allows me to control for all of them. I also do not have data for Y_{gct} and therefore replace it with GDP data for each trading partner.[133] Furthermore, since I do not have any information on the trade policies of countries other than Germany, I cannot

133. The GDP data comes from *Global Financial Data* in US Dollar, adjusted for the Dollar-Reichsmark exchange rate.

include Π_{gct}, the outward multilateral resistance term. I replace this with good times country fixed effects. As de Bromhead et al.[134] explain, it "is important to include these, since without variety fixed effects (...) estimated elasticities might be contaminated by any long run cross-variety correlation between average imports and average tariff rates."

I should estimate separate elasticities (that is, values for σ_g in the above equation) for each of our more than 500 product categories. However, the sample size for most of these product categories would be too small. Many of them are only sourced from a handful of countries and the time dimension is only 14 years long. Just like de Bromhead et al.[135] I therefore divide all goods into nine broader categories: grain, animal products, machinery, minerals, textiles, miscellaneous inputs, miscellaneous industry, food oils, and colonial goods. This assumes that the elasticity of substitution will be the same within each of these nine categories. For instance, demand for wheat would be subject to the same elasticity as demand for rye, since both are in the grain category.

This leaves me with the equation

$$\ln(V^W_{gct}) = \ln(GDP_{ct}) + \ln(E_{ct}) - \sigma_h \ln(1+t_{gct}) - \sigma_h \sum_{i=1}^{n} \ln(b_i)\delta_{igct} + d_{gt} + d_{gc} + u_{gct}. \tag{6.11}$$

d_{gt} and d_{gc} are the good times year and good times country fixed effects described above. The inclusion of these fixed effects ensures that what we are estimating is the elasticity of substitution between different varieties of the same good. σ_h is the elasticity of substitution for broad category h, with the assumption that $\sigma_g = \sigma_h$ if good g is in category h.

134. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection," 341.
135. Ibid.

Estimation Results

Table 6.3 shows the results of the regressions using equation 6.11. I use a poisson pseudo-maximum likelihood (PPML) estimator with a log-linear equation, which is in line with the suggestion of Silva and Tenreyro,[136] who advocate the use of PPML as a bias-free alternative to the non-linear transformation required for a log-log Ordinary Least Squares (OLS) regression.[137]The first column shows the results for the whole data set and the following columns provide elasticities for the nine broad categories. Across the whole data set, a tariff increase of 1 % is associated with a statistically significant 0.667 % decrease in imports. Eight 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 four of these, grain, animal products, miscellaneous inputs, and industrial goods, are significantly different from zero, meaning that the choice of varieties in the other categories is imprecisely estimated. In the implementation of the CGE model in GAMS, the elasticities get drawn randomly from a distribution with the estimated mean and standard error of the σ_hs for each of the 1,000 iterations. I set the elasticities to be replaced by 0 whenever these randomly drawn values are positive.

The other coefficients are as expected, with few exceptions. The trade partner's GDP, a trade treaty and good-specific treaty regulations are all associated with increased trade in most categories and in the data set as a whole, while the existence of a quota or of exchange controls absent a clearing agreement has a negative impact.

The elasticities could potentially be biased if there was a correlation between import trends and the change in tariff. This could for instance be the case if policy makers deliberately targeted goods with tariffs the import

136. J. S. Silva and S. Tenreyro, "The log of gravity," *The Review of Economics and statistics* 88, no. 4 (2006): 641–658.

137. I implemented this in Stata using the ppmlhdfe package by Correia et al. ("PPMLHDFE: Fast poisson estimation with high-dimensional fixed effects").

Table 6.3: PPML Estimations for σ_h

VARIABLES	(1) Total	(2) Grain	(3) Animal	(4) Mach.	(5) Minerals	(6) Textiles	(7) Misc. Inputs	(8) Misc industr.	(9) Food Oils	(10) Colonial
Log(1+Tariff)	-0.667**	-1.094**	-0.832***	-0.0537	0.359	-0.185	-0.295***	-6.286***	-2.313	-0.435
	(0.270)	(0.474)	(0.249)	(0.420)	(0.541)	(0.519)	(0.0964)	(0.772)	(3.407)	(0.639)
Treaty Country	0.154	0.0580	0.159	0.124	0.138	0.321*	0.0896	-0.554***	0.296**	0.0286
	(0.117)	(0.458)	(0.177)	(0.0769)	(0.337)	(0.165)	(0.187)	(0.144)	(0.146)	(0.121)
Treaty Good	0.204	0.374	0.345**	0.00185	0.129	-1.551***	-1.158**	1.082*	0.0919	-0.237
	(0.237)	(0.766)	(0.163)	(0.140)	(0.380)	(0.415)	(0.456)	(0.601)	(0.420)	(0.534)
Log(GDP)	1.358***	2.359***	1.420**	0.992**	0.993	-0.0979	1.976*	2.212***	-0.334	0.373
	(0.457)	(0.838)	(0.596)	(0.386)	(0.802)	(1.099)	(1.048)	(0.574)	(0.990)	(0.254)
Log(Ex. Rate)	-0.0341	0.0755	-0.0134	0.616	-0.319	0.0777	-0.181	0.103	-0.0393	-0.0106
	(0.0263)	(0.101)	(0.0130)	(0.385)	(0.242)	(0.117)	(0.130)	(0.168)	(0.163)	(0.105)
Ex. control	-0.213*	-0.0457	0.124	-0.743***	-0.252	-0.00879	-0.221	-0.624**	-0.0147	-0.617***
	(0.124)	(0.293)	(0.0841)	(0.137)	(0.281)	(0.299)	(0.237)	(0.267)	(0.126)	(0.150)
Quota	-0.611***				-0.625***					
	(0.158)				(0.210)					
Comp. Agr.	-0.0998						-0.265			0.0710
	(0.181)						(0.315)			(0.108)
Cartel	0.258**			-0.110	0.295*	1.186***	-0.433	0.855***		-0.583
	(0.121)			(0.108)	(0.179)	(0.271)	(0.299)	(0.225)		(0.750)
Unit Value in RM	0.00746	-3.603*	0.277	0.00206**	0.147	0.00325	0.0177	-0.00501	-0.0352	0.242*
	(0.00470)	(2.067)	(0.191)	(0.000952)	(0.109)	(0.00369)	(0.0127)	(0.00536)	(0.223)	(0.144)
Constant	-4.120	-13.09	-3.767	-4.552	-1.422	8.968	-10.55	-16.18**	13.97	6.706***
	(4.701)	(8.614)	(5.527)	(4.111)	(8.691)	(11.48)	(11.06)	(6.425)	(10.52)	(2.290)
Observations	37,722	1,047	1,630	9,780	4,681	6,804	9,249	1,218	1,937	1,103

*** p<0.01, ** p<0.05, * p<0.1
Dependent variable: Import value in Reichsmark. Robust standard errors in parentheses.
Standard errors clustered by country. Fixed effects for Year*Good and Country*Good included.

of which had increased a lot in previous years. I therefore test if there is any correlation between the change in imports from 1927 to 1930 and the change in ad valorem equivalent tariff rates from 1930 to 1933. The correlation between these two variables is close to zero at 0.0012.[138]

How do these elasticities compare to those found for other countries? In table 6.4 I compare my results for the σ_hs to those of de Bromhead et al. for the UK and Arthi et al. for India.[139] The German elasticities tend to be much lower in absolute terms than either of these.

This may shed some doubt on whether the estimation results are plausible and raise the question why they are so much lower. The elasticities are also significantly smaller than those found by Hungerland for the German Empire during the first globalization. He estimates elasticities of substitution at the

138. I also checked the correlation for the log changes, which is also very low at -0.048.
139. Both are taken from Arthi et al. (*The Impact of Interwar Protection: Evidence from India*, 20).

good level exploiting differences in unit values and finds a median elasticity of 3.8 with substantial heterogeneity between goods categories.[140]

I propose two possible reasons for the low elasticities. One is that, in line with the findings of Ritschl[141], the geographical structure of Germany's trade in the interwar period was the result of long-established relationships that went back to the time before World War I. It would therefore make sense that Germany's demand for the varieties imported from its most important trading partners was relatively inelastic. The second reason might be that the tariffs were not applied as strictly as the tariff laws suggest. Especially once the state increasingly interfered in the economy in the mid-1930s, goods were often imported by government departments directly. As a result, import tariffs were often subject to the discretion of the Nazi government resulting in higher absolute import values. Unfortunately the variety-level data does not allow me to distinguish between goods imported at the official tariff rate and goods subject to exceptions.[142]

6.6.2 Estimating γ

For the next step, I estimate the elasticity of substitution between different goods, γ. In order to estimate γ, I can make use of the first-stage results from our estimation of the σ_hs. I can use these results to calculate the CES quantity M_{gt} and corresponding prices $p_{M_{gt}}$ for the 530 products and 14 years in my sample. I then estimate

140. W.-F. Hungerland, "The Gains from Import Variety in Two Globalisations: Evidence from Germany," *European Historical Economics Society Working Papers*, no. 0120 (2017): 30.

141. Ritschl, "Nazi economic imperialism and the exploitation of the small: evidence from Germany's secret foreign exchange balances, 1938-1940."

142. That the elasticities measured by Hungerland are substantially higher is not surprising since he is estimating something different than I am. Since tariffs are not necessarily passed on to the consumer entirely, unit values may rise by a smaller margin than the tariff increase resulting in a smaller effect on demand. The elasticity of demand in response to a 1 % increase in $1 + t$ would therefore be lower than that in response to a 1 % increase in the unit value.

Table 6.4: Elasticities from other countries for comparison

	Grain	Animal	Machinery	Minerals	Textiles	Misc. Inputs	Misc. industry	Food oils	Colonial
Germany	-1.094	-0.832	-0.0537	0.359	-0.185	-0.295	-6.286	-2.313	-0.435
	(0.474)	(0.249)	(0.420)	(0.541)	(0.519)	(0.0964)	(0.772)	(3.407)	(0.639)
India			-5.735	-4.306	-4.046		-23.05	-8.583	-5.384
			(1.504)	(1.104)	(0.801)		(4.331)	(3.957)	(3.982)
UK	-9.567	-3.908	-4.533	-2.477	-1.861	-4.905	-7.995	-23.47	-1.468
	(4.829)	(1.489)	(1.951)	(0.743)	(3.350)	(2.787)	(2.509)	(3.098)	(0.533)

Source: Arthi et al. (2020), p.22. Robust standard errors clustered by country in parentheses.

$$\ln(M_{gt}) = -\gamma \ln \frac{p_{M_{gt}}}{P_{M_t}} + \theta \ln(I_t) + d_g + u_{gt} \tag{6.12}$$

I am interested in γ. p_{M_t} is an aggregate import price index, which I can calculate based on the trade data in the Statistisches Reichsamt[143] publications. I_t is an import volume index, which I can also derive from the trade data. The equation includes good-specific fixed effects d_g and an error term u_{gt}.

I use bootstrapping to repeatedly estimate the σ_h values based on equation 6.11 with new subsamples from the data, constructing values for M_{gt} and $P_{M_{gt}}$ and then estimating γ.[144] I ran 250 repetitions, 233 of which were successful. This procedure gives me an estimated mean for γ of 0.707 with a standard error of 0.097. This is again substantially lower than the value estimated by de Bromhead et al. for the UK (1.245).[145]

6.6.3 Estimating κ

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 of the form

$$\ln(m_t) = \alpha - \kappa \ln(1 + t_t) + u_t. \tag{6.13}$$

I am regressing m_t – the total value of imports in the sample in year t divided by the total expenditure on both domestic and imported goods – on the average ad valorem equivalent tariff from the German trade data, t_t with

143. Statistisches Reichsamt, *Statistisches Jahrbuch für das Deutsche Reich*.

144. Bootstrapping is a statistical method to estimate coefficients that relies on repeated re-sampling of the data. I employ it here because the estimates for γ and κ are themselves based on econometric estimates for the σ_hs. The bootstrap method draws subsamples from the sample distribution and estimates the coefficients and standard errors from these subsamples. This is repeated at least 100 times to get accurate standard errors. The idea behind the bootstrap is that for large sample sizes, the variability of the bootstrap estimate around the sample estimate will be close to the variability of the sample estimate around the true parameter value. See Chernick (*Bootstrap methods: A guide for practitioners and researchers*, 10) or Horowitz ("The bootstrap") for an in-depth treatment.

145. Arthi et al. do not estimate γ but assume it to be equal to 1.

an error term u_t. Arthi et al.[146] calculate total expenditure as the sum of net imports and expenditure on domestic goods. They construct the latter by multiplying annual GDP figures with a ratio of gross output to value added, then subtract exports of domestic produce. I follow their approach here: I use GDP estimates for Germany from Ritschl and Spoerer.[147] My ratio of gross output to value added is based on an input-output table for the year 1937, as constructed by Fremdling and Stäglin.[148] Their figures improve in many ways on older estimates of German interwar data from Hoffmann.[149] The annual import and export figures are from the Statistical Yearbooks of the German Reich.[150] The resulting estimate for κ is a coefficient of 1.169 with a standard error of 0.245. I provide alternative specifications for κ in the appendix, which show the value to be fairly robust. The highest value yielded by an alternative specification is 1.202.[151] This estimate is again much lower than that of de Bromhead et al. for the UK (2.294), but slightly higher than that estimated for India by Arthi et al. (1.073).

6.6.4 Choosing values for η

The last elasticity I need is the elasticity of transformation for the supply of goods. Further following the notation of de Bromhead et al.,[152] if ϵ_S is the own-price elasticity of export supply and $\alpha^X = 1 - \alpha^D$ is the share of exported goods out of all goods produced, and if I assume that an economy produces an exported good and a domestically consumed good

146. Arthi et al., *The Impact of Interwar Protection: Evidence from India*, 344.

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

148. Fremdling and Stäglin, "Output, national income, and expenditure: an input–output table of Germany in 1936."

149. Hoffmann, *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*.

150. Statistisches Reichsamt, *Statistisches Jahrbuch für das Deutsche Reich*.

151. I also estimate a value for κ via bootstrapping which results in a coefficient of 1.964.

152. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection."

with a constant elasticity of transformation η between these two goods, then $\eta = \epsilon_S/(1 - \alpha^X)$. de Bromhead et al.[153] assume a distribution for ϵ_S that fits the values for 27 OECD countries presented by Tokarick,[154] that is a log-normal distribution with mean 0.403 and standard deviation 0.468. Based on this it is possible to take repeated draws from such a distribution and calculate corresponding values for η.

6.7 Construction of Counterfactual scenarios

I can now use the elasticities estimated above – γ, κ, η, and the σs – to simulate counterfactual scenarios and see what would have happened to the German imports if trade policy had remained constant in the Great Depression. I choose 1929 as the last year of moderate trade policy since the biggest increase in tariffs occurs in 1930. Figure 6.1 above showed that the decisive shift in German trade policy happened around the time of the accession of Heinrich Brüning to the chancellorship in March 1930. Before this point the average tariff rate was on a mostly flat, if not slightly decreasing, trajectory.

For each of the 14 years in the data, I calibrate a computable general equilibrium model using the MPSGE software package in the GAMS programming environment (for an explanation of the modeling framework, see Rutherford[155]) based on the disaggregated import data as well as GDP data from Ritschl and Spoerer[156] and total imports from Hoffmann.[157] I construct

153. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection."

154. S. Tokarick, "A method for calculating export supply and import demand elasticities," *The Journal of International Trade & Economic Development* 23, no. 7 (2014): 1059–1087.

155. T. F. Rutherford, "Applied general equilibrium modeling with MPSGE as a GAMS subsystem: An overview of the modeling framework and syntax," *Computational economics* 14, nos. 1-2 (1999): 1–46.

156. Ritschl and Spoerer, "Das Bruttosozialprodukt in Deutschland nach den amtlichen Volkseinkommens-und Sozialproduktsstatistiken 1901-1995."

157. Hoffmann, *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*.

a downward-adjusted GDP for each year based on the sample of goods in my data set so that the ratio of imports to GDP in the model matches the real ratio.

I calibrate each annual model based on the actual data for both trade flows and policy parameters in that year. Then I freeze all tariffs at their 1929 value for all subsequent years and run the models again with these counterfactual tariffs, using the elasticities that I previously estimated. The estimated coefficients in the first column of table 6.3 suggest that the effect of a quota is equivalent to a 149.9 % tariff increase, that the effect of a treaty provision for a specific good is equivalent to a 26.4 % tariff reduction, and that the effect of exchange controls in the absence of a clearing agreement is equivalent to a 37.6 % tariff increase.[158] I incorporate the quota, exchange control, and treaty dummy variables with these values into the model.

The resulting simulated values for German imports allow me to compare them to the real imports. However, I need to take into account the fact that the elasticities are econometrically estimated. Following de Bromhead et al.'s method,[159] I therefore draw 1,000 values for each of them from truncated normal distributions with the previously estimated means and standard errors and a lower bound of 0. Based on these 1,000 values, I can run the model 1,000 times and obtain a distribution of counterfactual scenarios.

6.7.1 The Impact of Tariffs and Quotas on Total German Imports

Graph 6.9 shows the results of the CGE analysis. It shows the relative difference in per cent between the real import values and the simulated

158. I can solve equation 6.11 with the estimated coefficients as $-0.667\ln(1+t_{gct}) = (-0.611)*QUOTA_{gct}$ with $QUOTA = 1$, which gives me $t = 1.499$. Furthermore, I can solve $-0.667\ln(1+t_{gct}) = (0.204)*TREATY_{gct}$ with $TREATY = 1$, which gives me $t = (-0.264)$ and $-0.667\ln(1+t_{gct}) = (-0.213)*XCONTROL_{gct}$ with $XCONTROL = 1$, which gives me $t = (0.376)$.

159. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection."

import values with frozen 1929 tariffs, quotas, treaties, and absence of exchange controls and clearing agreements. The increased protectionism in the 1930s – both as a result of explicit laws and of deflation relative to the specific rates rates – reduced the German value of imports by, on average, 30.8 % until the year 1933, with a 90 % confidence interval between 21.3 and 41.1 %. As the German economy began to recover but imports remained low, the effect of trade policy remained at a similar level for the rest of the 1930s. Imports were 25.5 % lower as a result of tariffs and quotas in 1936 (90 % confidence interval between 17.0 and 35.0 %) and 32.0 % in 1938 (90 % confidence interval between 21.8 and 43.1 %. While these confidence intervals are wide, the effect even at the lower bound is big. For comparison, the German year-on-year import decline in the Great Recession was about 17.5 %.[160] The protectionist measures introduced by the German government (or as a result of trade policy by omission during periods of deflation) resulted in a trade collapse almost twice as big as the entire 2009 collapse. In the context of the Great Depression, such a decline can explain a little less than half of Germany's trade collapse[161] That is a far bigger effect than previous research has found for trade policy in the Depression trade collapses of the United Kingdom,[162] India[163] or the United States.[164]

6.7.2 The Impact of Tariffs and Quotas on the Import Share of the Reichsmark Bloc

I define the members of the Reichsmark Bloc as Bulgaria, Romania, Greece, Yugoslavia, Austria, Hungary, Turkey, and Brazil. Graph 6.10 shows what

160. Calculated based on import value data from the Federal Office for Statistics.

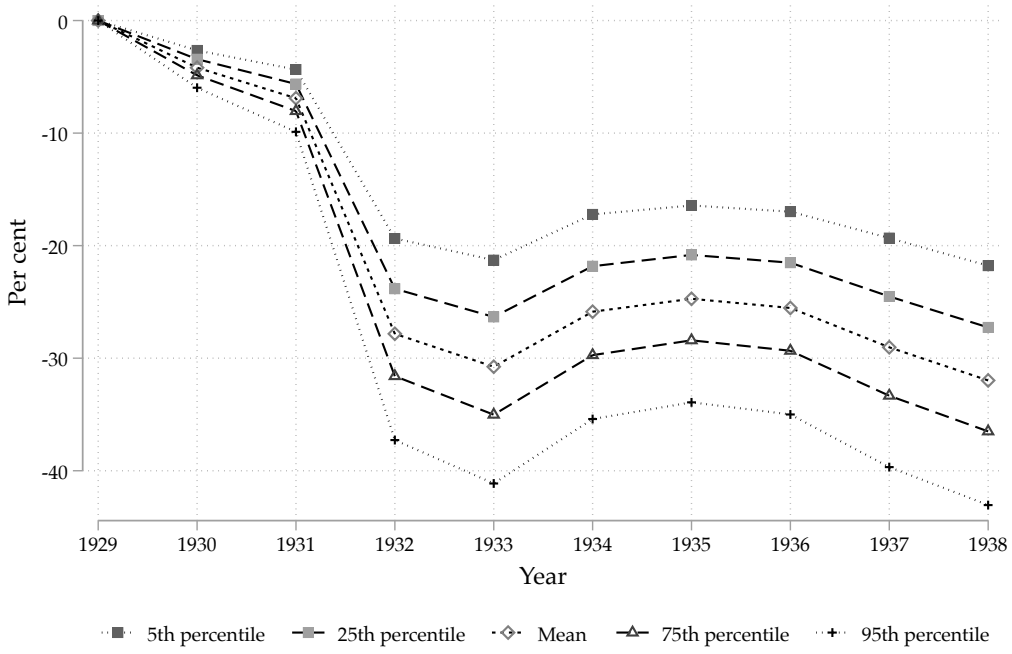
161. The total value of imports fell from 13.447 billion Reichsmark in 1929 to 4.204 billion Reichsmark in 1933, a decline of 68.7 % The total decline of imports from the pre-crisis peak to the nadir was even bigger, starting at 14.228 billion in the year 1927.

162. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection."

163. Arthi et al., *The Impact of Interwar Protection: Evidence from India*.

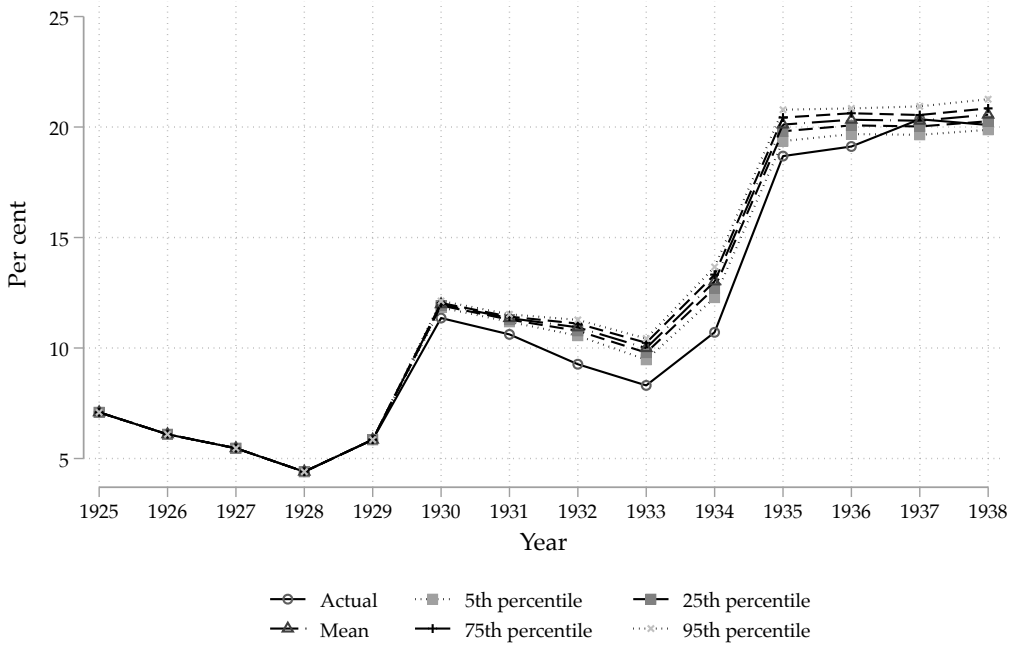
164. Irwin, "The Smoot-Hawley tariff: A quantitative assessment."

Figure 6.9: Total imports compared to simulated counterfactual with 1929 tariffs (in %)



effect the tariff shifts had on the increase in the share of the bloc members in German imports. The answer, in short, is none. While Germany introduced various preferential tariffs and import guarantees for the countries of Southeastern Europe, these seem not to 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 higher share of overall German imports than under the protectionist policies of the 1930s: 20.1 % compared to the actual share of 18.7 % in the year 1935, with a fairly narrow confidence interval between 19.4 and 20.8 %.

Figure 6.10: Simulated share of the Reichsmark Bloc under 1929 tariffs (in %)

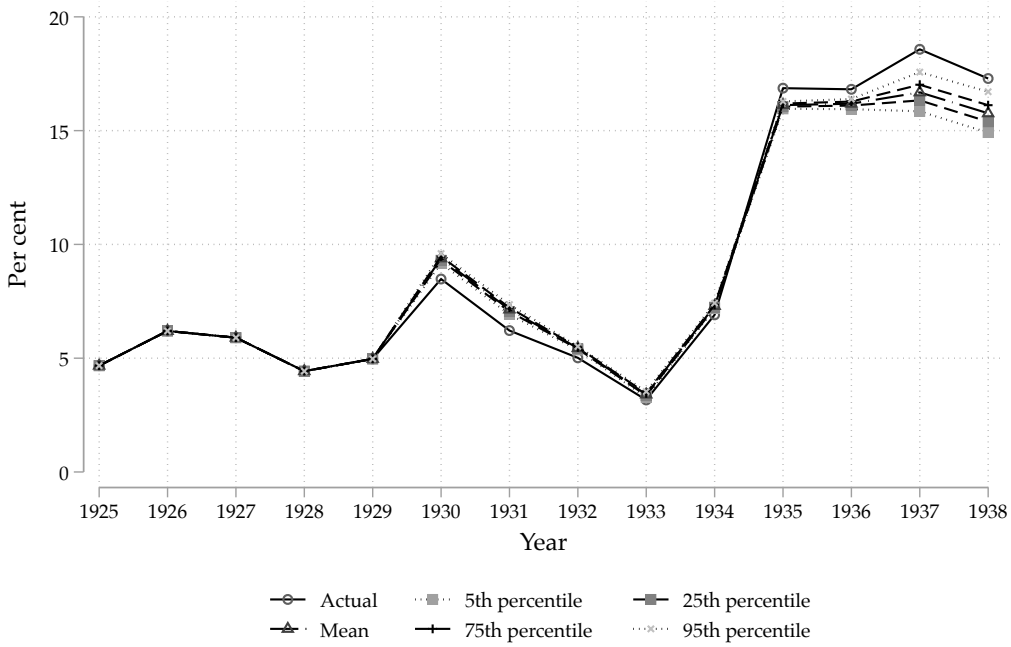


6.7.3 The Impact of Tariffs and Quotas on the Reichsmark Bloc's Share of Strategic Goods

The German government in the 1930s did not intend to increase trade between Germany and the Reichsmark Bloc countries *per se*, but rather wanted to increase imports of certain strategically important goods — primarily raw materials and agricultural goods — to ensure the independence of Germany's war economy from the West. Compositional effects may be hiding the impact of discrimination in favour of the bloc. I therefore now look separately at the share of Reichsmark bloc imports only among agricultural goods and raw materials. The results, depicted in figure 6.11, suggest that trade policy did indeed have an impact on the share of raw materials and agricultural goods imported from the Reichsmark Bloc once more discriminatory policies came into place, from 1934 onwards. The share of Reichsmark Bloc import was higher as a result of discrimination by a statistically significant margin from

1935 to 1938. However, the effect is relatively small. The gap between the simulated mean share and the benchmark share is biggest in 1937, when the share without changes in trade policy would have been 16.7 % as opposed to 18.6 %, a difference of 1.9 percentage points.

Figure 6.11: Simulated share of the Reichsmark Bloc among imports of strategic goods under 1929 tariffs (in %)

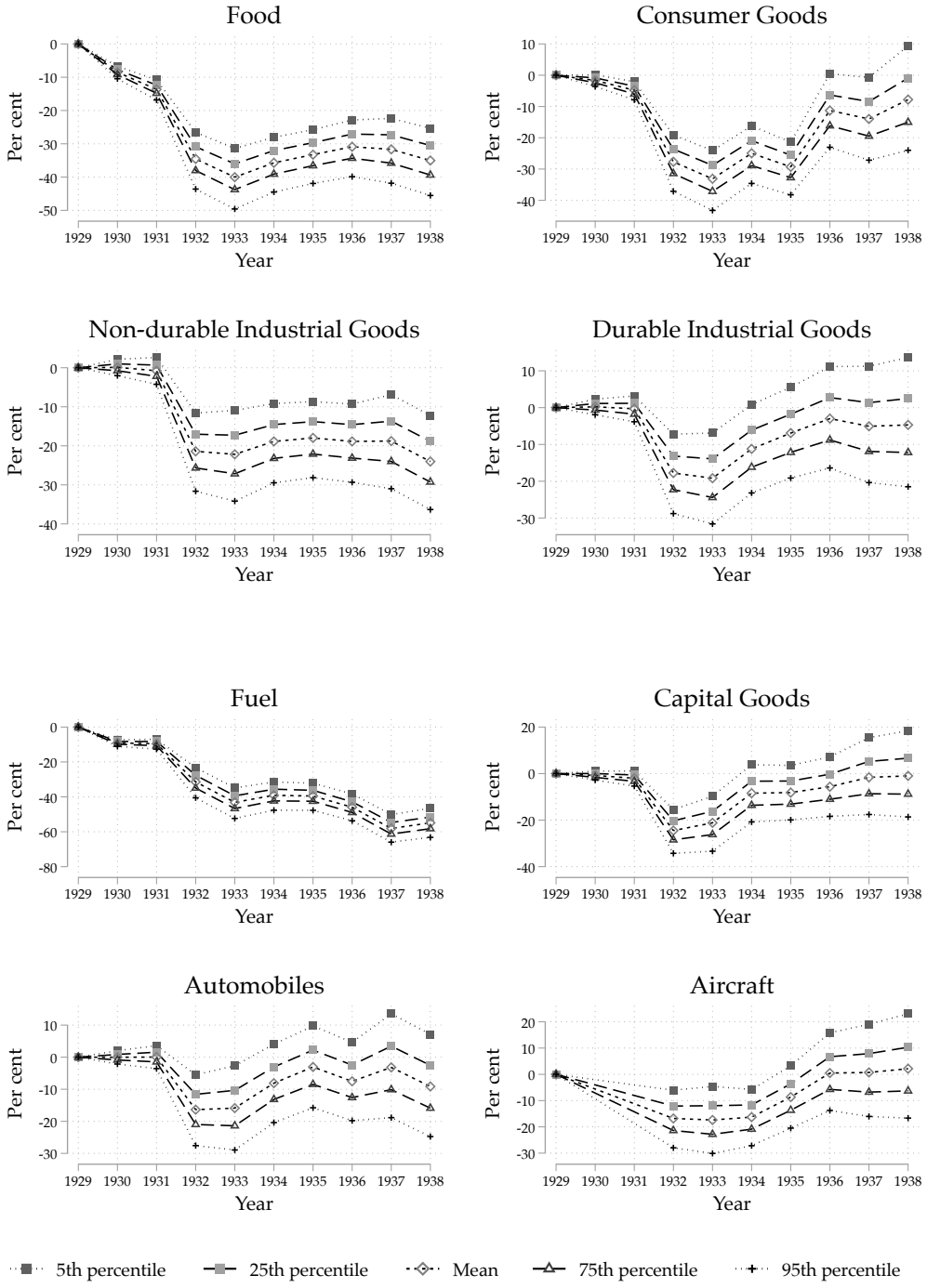


6.7.4 Impact of Trade Policy by Good Category

Can trade policy explain the patterns of the German trade collapse seen in a previous chapter of this dissertation? I let the model report the rise and fall of trade in the nine categories used in the previous analysis: Food, durable and non-durable consumer goods, durable and non-durable industrial goods, fuel, automobiles, aircraft, and other capital goods.

Figure 6.12 shows the results. The graphs show that the trade policy-induced shock was primarily concentrated in the categories of food, consumer goods, and fuel. Food imports declined by 40.2 % as a result of protectionism

Figure 6.12: Simulated Decline in Trade Value by Category (in %)



between 1929 and 1933. Fuel imports declined by 43.3 % as a result of protectionism by 1933 and kept falling until the end of the period when,

in 1937, actual trade was 58.4 % lower than trade in the counterfactual simulation. Imports of non-durable consumer goods also declined by 33.1 % in comparison to the counterfactual. Meanwhile, imports of industrial and capital goods were impacted much less. All of them were affected by the introduction of exchange controls in 1931 but the difference between counterfactual and real trade disappears by the end of the period for most of them. Imports of non-durable industrial goods were less affected than the average across all imports with a 22.0 % decline until 1933. Imports of durable industrial goods and other capital goods were on average only 18.9 % and 21.0 % lower in 1933 than they would have been under the 1929 tariff regime and by the late 1930s, the confidence intervals are too wide to attribute any significant effect to trade policy here. The same is true of aircraft and automobile imports which fell even less (17.1 % and 16.2 % respectively) and recovered quickly once clearing agreements were in place.

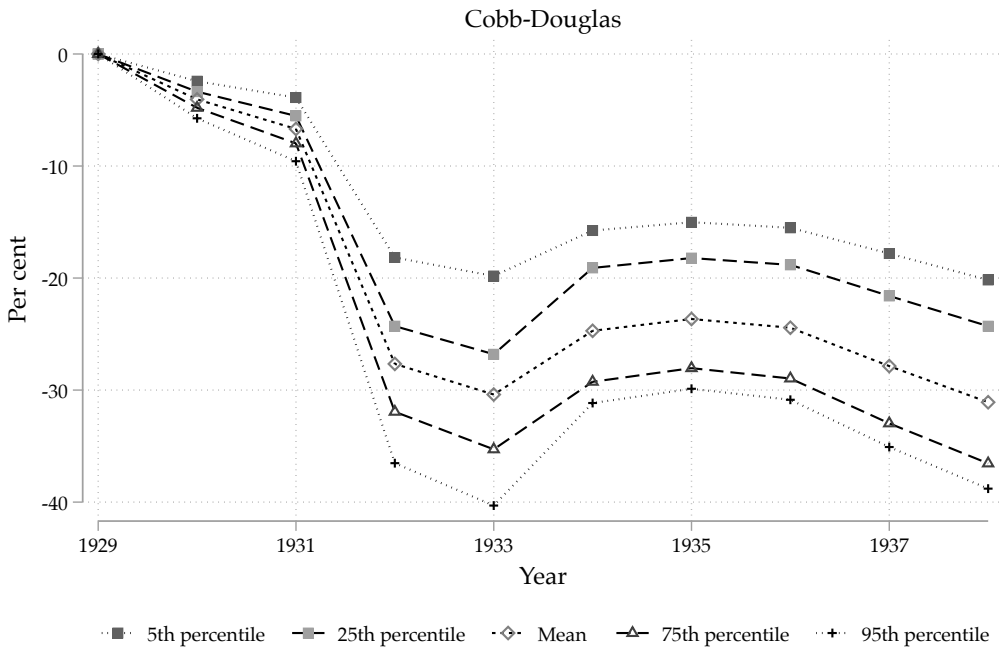
6.8 Robustness Checks

The size of the impact ultimately rests on the estimated elasticities. If the elasticities were biased in any way, the estimated effect could be wrong. In order to test a range of scenarios, I run the same simulations with different elasticities.

6.8.1 Cobb-Douglas Specification

The value for γ estimated through bootstrapping is 0.707 with a standard error of 0.097. I repeat the simulation using a Cobb-Douglas function where $\gamma = 1$ instead. The results are very similar as shown in figure 6.13.

Figure 6.13: Simulation with Cobb Douglas preferences (in %)



6.8.2 Different values for κ, τ, γ and σ_h

In table 6.5 I repeat the simulations for the year 1933, the low point of the trade collapse and compare the results using different specifications with different elasticities. Column (1) shows the estimated mean values for the decline in total trade and share of the Reichsmark bloc under the baseline specification. Column (2) shows the results from regressions using fixed effects at the SITC 3-digit category level. In column (3) I also exclude all revenue goods that might be skewing the results. Column (4) shows results from Ordinary Least Squares regressions. Columns (5) to (13) then change individual elasticities, but keep everything else equal to the baseline specification. The regression specification has very little impact on the magnitude on the effect as the first four columns show, nor do different values for γ. More extreme values for κ and τ make more of a difference, with higher elasticities leading to

a simulated decline in trade of up to 41.07 %. I provide graphs of these alternative specifications for all years in the appendix.[165]

I conduct one further robustness check to alleviate doubts about the very low elasticities. I re-run the MPPL regressions with only the data from 1925 to 1930 before substantial interference in the economy other than tariffs.[166] The estimated elasticity of substitution across all goods is -0.867 in this case with the nine categories' coefficients ranging from -6.3 to 0.158, very similar in magnitude to the elasticities used for the main results in this chapter.

6.8.3 Different Benchmark Year

I have so far used 1929 as the last year before the paradigm shift in trade policy. This choice is to some extent arbitrary since there was no one big tariff reform in Germany in 1930 like the one following the Ottawa Conference in the United Kingdom or like the Smoot-Hawley Tariff in the United States, but rather a series of smaller measures that added up to a big shift. Moreover, there had been a trend towards higher tariffs in the years before already. I therefore simulate import values and trade bloc shares with tariffs frozen in 1925 to see whether the base year has a notable impact on the magnitude of the effect. The results, depicted in figure 6.14, assume a Cobb-Douglas form with $\gamma = 1$. The graph shows that the majority of the decline resulting from tariffs did indeed take place in the years after 1929 as assumed with my initial choice of benchmark year. Relative to the base year 1925, trade collapsed by 33.0 % as a result of protection by the year 1933.

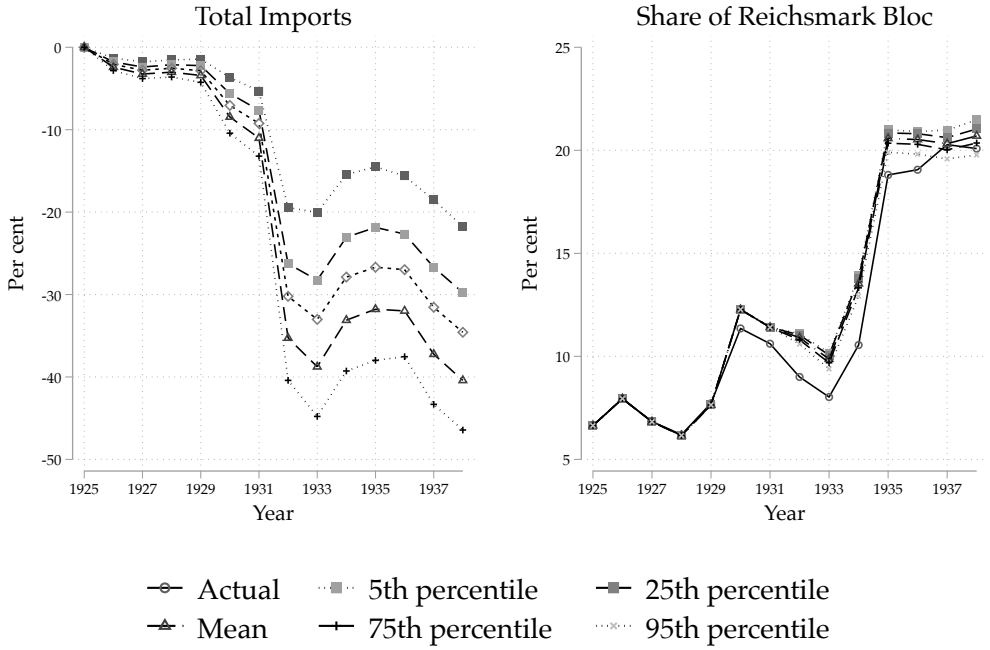
165. Note that the base line specification is not exactly identical with the mean value for 1933 from the graph above. This is because the results in table 6.5 are point estimates with fixed elasticities used in the simulation while the results in the graph are based on 1000 repeated random draws from a truncated normal distribution. Because the elasticity is assumed to be 0 whenever the draw results in a negative number, the mean elasticities over these 1000 draws will be slightly different from the ones used in the point estimates.

166. This drastically reduces the amount of variety, so I use the variety-specific unit values instead of the good-specific ones to calculate the ad valorem tariff rates in this specification.

Table 6.5: Simulation results with different elasticity specifications for the year 1933

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Base line	PPML SITC*country* year	PPML SITC*country* year, no rev. goods	OLS	$\gamma = 1$	$\gamma = 2$	$\gamma = 3$	$\kappa = 1.20$	$\kappa = 1.96$	$\tau = 1$	$\tau = 2$	$\tau = 3$	$\tau = 5$
Total decline	-31.53	-31.54	-31.54	-31.54	-30.98	-29.35	-28.69	-32.00	-40.22	-26.03	-33.78	-37.49	-41.07
Bloc share	10.06	9.814	9.814	9.807	10.46	10.91	9.472	10.06	10.06	10.06	10.06	10.06	10.06

Figure 6.14: Simulations with base year 1925 (in %)



6.9 Conclusion

Previous research on German trade policy – and trade policy in the interwar period in general – has mostly relied on very aggregated measures of trade and protectionism. One recent exception to this has been the work of de Bromhead et al.[167] on the United Kingdom, who look at what trade policy actually did at the level of goods and countries. Their work shows that it is important not to treat trade policy as a black box and actually look at what specific policy measures did. In this chapter I have made use of a new data set for German trade and trade policy that allows me to investigate the impact of tariffs and other trade policy measures across 530 goods traded with 50 countries. The results suggest that trade policy led to a significant reduction in German trade that mostly occurred between 1930 and 1933. However, relative to the total collapse in German imports in this period,

167. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection."

trade policy can only explain less than half of the total decline. The results based on the benchmark year 1925 suggest that Hentschel[168] was right when he speculated that "(b)efore 1929 [...] agricultural protectionism [was not] particularly important." The impact of protectionism on total imports was much bigger in Germany than in the United Kingdom or India during the same period. For the UK, de Bromhead et al. have found an average trade policy impact on imports of 10.8 % in the year 1933 while for India, Arthi et al. have found an average effect of about 10 % for 1934. The German estimate for 1933 is approximately three times as high as either of these two.[169] [170]

In contrast to this big impact of trade policy on total trade volumes, the big geographical shift in Germany's import structure in the 1930s – from Western countries such as the United States, the United Kingdom, and France to Southeastern Europe and Latin America – was not due to tariffs and quotas at all.

It is worth noting in this context that a large part of the tariff increase was not the result of explicit legislative changes (although those were manyfold as well) but of the Depression-era deflation in international commodity markets that drove down import unit values relative to the specific tariffs. Trade policy, as I use the term in this chapter, therefore includes trade policy by omission. At the height of the Great Depression, price declines indeed accounted for more of the increase in ad valorem tariffs than legislative changes.

The CGE simulation suggests that with tariffs and quotas frozen in 1929 and in the absence of new discriminatory measures, the Reichsmark bloc's share of total German imports would even have been slightly higher in the mid-1930s. A significant impact of discriminatory policies on the share of the Reichsmark bloc is only apparent when looking at agricultural and raw

168. V. Hentschel, "Zahlen und Anmerkungen zum deutschen Außenhandel zwischen dem ersten Weltkrieg und der Weltwirtschaftskrise," *Zeitschrift für Unternehmensgeschichte / Journal of Business History* 31, no. 2 (1986): 95–116.

169. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection," 346.

170. Arthi et al., *The Impact of Interwar Protection: Evidence from India*, 22.

material goods separately and even here the effect is relatively small. This result stands in contrast to de Bromhead et al.'s findings for the United Kingdom and Arthi et al.'s findings for India, where trade policy mattered a lot for the geographical re-orientation towards the British Empire.[171]

Trade policy also impacted different import sectors to different degrees. The impact of tariffs and quotas was highly concentrated in the fuel, food, and consumer goods sectors, where imports declined a lot as a result of trade policy. Trade policy can therefore explain to a large extent the persistent and disproportionate decline in imports in these sectors between 1931 and 1933 relative to other sectors found in the previous chapter of this dissertation. Trade in industrial and capital goods, in contrast, was not significantly affected at all.

It is worth keeping in mind that these results cannot speak to the impact that all of the increasing state intervention and the establishment of a quasi-monopsony in trade under the Nazis (with many important raw materials and food imported through *Reichsstellen*) had on the diversion of imports. It only does it in so far as the CGE model assumes a competitive market with profit and utility maximization and thus implicitly simulates a counterfactual in which the more direct Nazi interventions do not occur. The most important trade policy measures that the model can only indirectly capture are the exchange controls introduced in 1931. For both the total decline and the share of the Reichsmark bloc, the results presented here therefore represent a conservative estimate of the effect of trade policy. Future research that manages to better quantify the impact of these measures would be a valuable expansion of the results presented here.

One limitation of one-country studies like this one is that they can only imperfectly capture developments at the international level. Albers has argued for the importance of beggar-my-neighbor effects in international

171. de Bromhead et al., "When Britain turned inward: the impact of interwar British protection," 349.

trade during this period, which could only fully be captured in a multi-country model.[172] Recent research by Mitchener et al. has also documented the importance of retaliatory tariff measures in the Great Depression with large welfare losses as a result.[173] Measuring the impact of such retaliation and beggar-thy-neighbor effects against Germany could yield interesting results in future research. In this context it would also be fruitful to look at the export side of German trade in more detail.

172. Albers, "Currency devaluations and beggar-my-neighbour penalties: evidence from the 1930s."

173. K. J. Mitchener et al., "The Smoot-Hawley Trade War," *Oxford Economic and Social History Working Papers*, no. 188 (2021).

7

Concluding Remarks

7.1 Summary of results

The Great Depression constituted an enormous shock to the German political system that ultimately led to the collapse of a fragile democracy after years of austerity and skyrocketing unemployment numbers.[1]

In this dissertation, I have shed new light on one important channel through which the Depression altered German economic policy and the impact this had: the shift from an only moderately protectionist platform towards rapidly rising tariff rates and an attempt to ensure economic autarky. Trade and trade policy played a central role in these upheavals. Rising trade restrictions were the only option left to Germany in order to avoid devaluing the Reichsmark or further increasing deflationary pressure in the

1. G. Galofré-Vilà et al., "Austerity and the Rise of the Nazi Party," *The Journal of Economic History*, 2021, 1–33.

domestic economy.[2] Devaluation was not an option Heinrich Brüning was willing to consider in the light of Germany's history of hyperinflation.[3] Trade policy therefore became the central economic policy instrument used by the Brüning government to stop capital flows out of Germany, but also to appease special interests, primarily in the agricultural sector, and to respond to beggar-thy-neighbor effects as a result of other countries' devaluation.[4]

In the previous four chapters, I have presented and made use of new data that allow us to look at trade flows and tariffs, at political voting blocs, and at agricultural and industrial structure, at a highly disaggregated level. These data point to several important conclusions about the structure of German trade and protectionism in the interwar period.

First, trade policy interests mattered for voting behaviour in the Weimar Republic. Employees in sectors that were competitive on the international stage and net exporters of goods tended to vote less for protectionist parties like the DNVP or the NSDAP. Those who worked in import-competing sectors such as agriculture were far more likely to do so and were disproportionally found among the protectionist parties' voter base. Farmers also voted along trade policy interest lines, with cattle and pig farmers being less protectionist than grain farmers before the onset of the crisis and pig farmers remaining so after it.

Second, the trade collapse in the Great Depression was in many ways similar in its structure to that experienced by the United Kingdom at the time, as well as that during the Great Trade Collapse of 2008/09, at least during the first two years of the crisis before exchange controls and higher tariffs shifted the relative importance of different goods. Trade declined predominantly at the intensive margin and in nondifferentiated goods. The

2. Eichengreen and Irwin, "The slide to protectionism in the Great Depression: Who succumbed and why?"

3. Irwin, *Trade Policy Disaster: Lessons from the 1930s*.

4. Albers, "Currency devaluations and beggar-my-neighbour penalties: evidence from the 1930s."

decline in industrial goods trade far exceeded that in consumer goods, food, and fuel in the first two years (from 1929 to 1931) but this relationship was inverted between 1931 and 1933.

Third, German tariff hikes were relatively well-targeted, with effective protection being aligned well with nominal tariff rates. Effective protection was even more concentrated in the agricultural sector than the nominal data suggest, which matches the narrative of the German protectionist shift as being driven primarily by agricultural interests.

Fourth, trade policy – both by omission during the deflationary period of the Great Depression and by explicit legislative changes – had a big impact on the total value of German imports but very little impact on the geographical re-orientation of these imports away from North America and Western Europe towards Latin America and Southeastern Europe. Compared to a counterfactual with tariffs, quotas and treaties fixed in 1929 for the rest of the interwar period, trade fell by approximately 30 % until 1933 and by more than 32 % by 1938. This significant drop occured primarily in three categories of goods: consumer goods, fuels, and food, the same three categories that experienced a disproportionate decline in the second half of the Depression, suggesting that the reason for the inverted structure lies in the dramatic shift in trade policy in these years. Price declines were responsible for a large share – and at the height of the Depression even a larger share than explicit legal changes – of the rise in protectionism.

7.2 Outlook

The data introduced here offer exciting opportunities for further research themselves that go beyond the scope of this thesis. The district-level data on the sectoral structure of the labor market lend well to analyses of the geospatial structure of the German interwar economy. Further variables at

the same level of aggregation could easily be added from the same volumes of the Statistics of the German *Reich*.

The research in this dissertation is part of a broader trend in the last decade to investigate the structure of trade in the interwar period, the role of trade in the Great Depression and the impact of the shifts in trade policy at the time.[5] It fits into a broader trend described by Albers:

> It is only in recent years, that the technological revolution in computing has made the macroeconometric approach workable. Researchers can now analyse large datasets much more easily. In many ways, such datasets have the potential to refine our view of the Great Depression by empirically pulling the threads together from all waves of research.[6]

Further case studies of trade in other major interwar economies would benefit our understanding of the enormous trade collapse in the early 1930s and trade collapses more generally. This thesis also contributes to ongoing efforts in the literature to transcribe the wealth of micro-data available for international trade in the first half of the 20th century (such as Federico and Tena-Junguito[7] for global trade 1900-1938 or Hungerland[8] for German trade up to 1913).

It has become almost a cliché of the literature on the history of international trade that globalization has always come in waves. The emergence of free trade

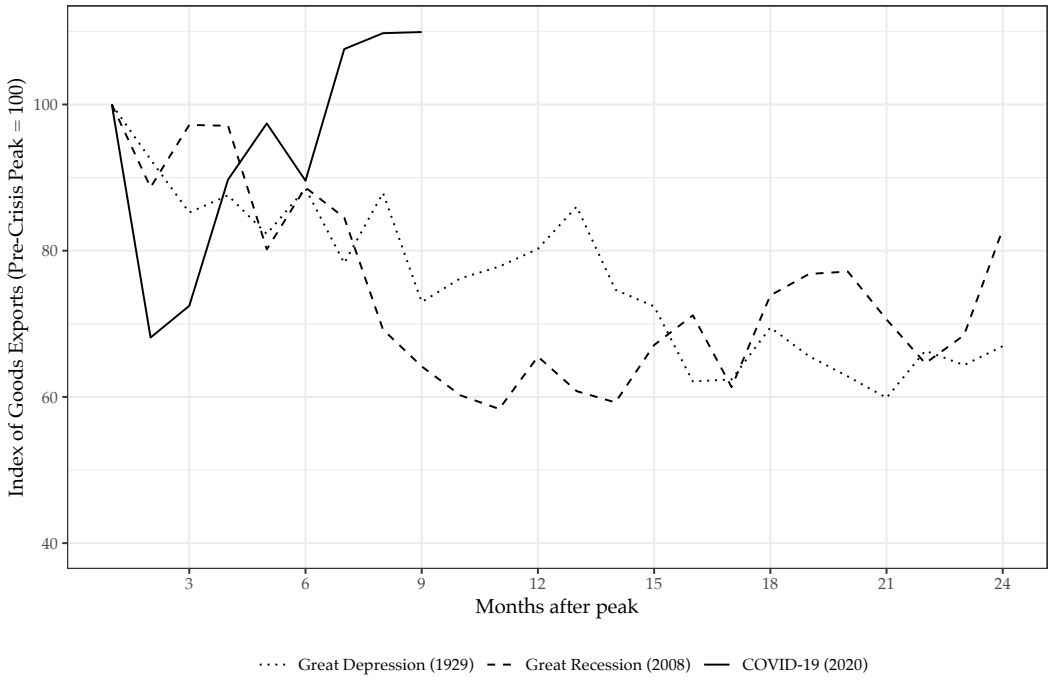
5. Irwin, *Trade Policy Disaster: Lessons from the 1930s*; A. de Bromhead, "Women voters and trade protectionism in the interwar years," *Oxford Economic Papers* 70, no. 1 (June 2017): 22–46; de Bromhead et al., "The anatomy of a trade collapse: the UK, 1929–1933"; de Bromhead et al., "When Britain turned inward: the impact of interwar British protection"; Adam, *Return of the tariffs: The interwar trade collapse revisited*; Arthi et al., *The Impact of Interwar Protection: Evidence from India*; D. S. Jacks and D. Novy, "Trade blocs and trade wars during the interwar period," *Asian Economic Policy Review* 15, no. 1 (2020): 119–136; T. N. H. Albers, "Trade frictions, trade policies, and the interwar business cycle," *European Review of Economic History* 24, no. 3 (2020): 627–628; Albers, "Currency devaluations and beggar-my-neighbour penalties: evidence from the 1930s"; Mitchener et al., "The Smoot-Hawley Trade War."

6. T. N. H. Albers, "Trade Frictions, Trade Policies, andthe Interwar Business Cycle" (PhD diss., London School of Economics, 2018), 22.

7. G. Federico and A. Tena-Junguito, "World Trade, 1800-1938: A New Synthesis," *Revista de Historia Económica / Journal of Iberian and Latin American Economic History* 37, no. 1 (2019): 9–41.

8. W. Hungerland, "Der deutsche Außenhandel in der Ersten Globalisierung: neue Daten, neue Erkenntnisse," *WISTA–Wirtschaft und Statistik* 72, no. 1 (2020): 65–77.

Figure 7.1: Three Major German Trade Collapses in Comparison



Sources: World Trade Organization, Statistisches Jahrbuch für das Deutsche Reich

in the mid-19th century that began with the repeal of the corn laws in Britain and quickly spread across the globe eventually birthed a populist backlash and the formation of protectionist coalitions like Bismarck's "marriage of iron and rye."[9] While the first wave of globalization was violently interrupted by World War I, its final death blow arrived in the Great Depression.[10] In light of the rise of a new globalization backlash in the decade since the Great Recession, it is all the more timely to study the interwar period.

9. see, for instance, O'Rourke and Williamson (*Globalization and History: The Evolution of a Nineteenth-century Atlantic Economy*)

10. To what extent World War I can be seen as a "decisive break" with globalization, given that it was itself a global event, is discussed by Tooze and Fertik ("The world economy and the great war") and O'Rourke ("Economic history and contemporary challenges to globalization").

The shifts and shocks in the global economy between 2008 and 2020 – from the Great Recession via the rise of anti-globalization political groups to the economic impact of the COVID-19 pandemic – have not reached the magnitude of the Great Depression so far. We have not experienced an "end of globalization" in the last decade.[11] However, that does not mean that major recessions (in 2009 and 2020), global trade collapses (also in 2009 and 2020), and a shift towards de-globalization measures (such as the Chinese-American trade war started by the Trump administration,[12] increased trade barriers between the United Kingdom and the European Union after Brexit[13] or the emergence of export restrictions during the pandemic[14]) do not have serious effects. Studying the Great Depression and the de-globalization that came with it is a stark reminder that market integration does not only proceed in one direction.

As figure 7.1 shows, German exports were collapsing at a much faster rate in the early months of the COVID-19 crisis than during the Great Depression and it looked like the world might face a "Greater Trade Collapse", more devastating than the "Great Trade Collapse" of 2009.[15] This makes understanding the few examples of such extreme events for which we have reliable micro-data all the more important. It will be interesting to see, once the dust has settled on the 2020 trade collapse, how its structure compares

11. O'Rourke, "Economic history and contemporary challenges to globalization."

12. M. Amiti et al., "The impact of the 2018 tariffs on prices and welfare," *Journal of Economic Perspectives* 33, no. 4 (2019): 187–210; M. Amiti et al., "Who's paying for the US tariffs? A longer-term perspective," in *AEA Papers and Proceedings*, vol. 110 (2020), 541–46; P. D. Fajgelbaum et al., "The return to protectionism," *The Quarterly Journal of Economics* 135, no. 1 (2020): 1–55.

13. T. Sampson, "Brexit: The Economics of International Disintegration," *Journal of Economic Perspectives* 31, no. 4 (November 2017): 163–84; J. B. Steinberg, "Brexit and the macroeconomic impact of trade policy uncertainty," *Journal of International Economics* 117 (2019): 175–195.

14. R. Baldwin and S. Evenett, *COVID-19 and Trade Policy: Why Turning Inward Won't Work* (2020); T. Falkendal et al., "Grain export restrictions during COVID-19 risk food insecurity in many low-and middle-income countries," *Nature Food* 2, no. 1 (2021): 11–14.

15. R. Baldwin, "The Greater Trade Collapse of 2020: Learnings from the 2008-09 Great Trade Collapse," *VoxEU.org*, 2020,

to the shocks of the Great Depression and Great Recession, especially since the fundamental cause was so different this time around.

Finally, the results of this dissertation also emphasize that international trade – the movement of real goods between countries – matters in history, especially in the interwar period and must not be ignored when trying to understand major political shifts such as the gradual radicalization of the Weimar electorate. The flow of goods and the policies that were meant to interrupt it played an important role in the motivation of voters, politicians, and special interest groups to pursuing agendas that ultimately led to the downfall of the republic. Trade and market integration mattered for rapproachment with the "hereditary enemy" France in 1927, it mattered for Germany's ability to pay reparations, for the agricultural sector's vulnerability in the Great Depression, and ultimately for Germany's supply of raw materials on its path towards war.

Appendices

A

Appendix to Chapter 3

A.1 List of trade volumes as aggregated at the level of Gewerbegruppen

Animal husbandry: *Lebende Tiere, Rohseide und Forettseide, Wolle u. and. Tierhaare, Lamm- und Schaffelle, behaart, Kalbfelle und Rindshäute, Felle zu Pelzwerk, roh, Sonstige Felle und Häute, Federn und Borsten, Tierfett und Tran, für gewerbliche Zwecke, Därme, Magen, Goldschlägerhäutchen u. dergl.*

Fishing: *Fische und Fischzubereitungen*

Mining: *Eisenerze, Kupfererze, Zinkerze, Schwefelkies, Manganerze, Sonstige Erze und Metallaschen, Steinkohlen, Braunkohlen, Koks, Preßkohlen, Steinkohlenteer, -öle und Derivate, Mineralöle*

Nonmetallic minerals: *Mineralphosphate, Zement, Sonstige Steine und Erden*

Iron and Metal Production: *Eisen, Kupfer, Blei, Zinn, Zink, Aluminium, Sonstige unedle Metalle*

Metalwares: *Waren aus Edelmetallen, Waren aus Eisen, Waren aus Kupfer, Vergoldete und versilberte Waren, Sonstige Waren aus unedlen Metallen*

Machinery and vehicles: *Textilmaschinen, Dampflokomotiven, Tender, Werkzeugmaschinen, Landwirtschaftliche Maschinen, Sonstige Maschinen (außer elektrischen), Kraftfahrzeuge, Kraftfahrräder, Fahrräder, Fahrradteile*

Electronics, precision mechanics, optics: *Elektrische Maschinen (einschl. Teile), Elektrotechnische Erzeugnisse, Uhren, Sonstige Erzeugnisse der Feinmechanik*

Chemicals: *Farben, Firnisse und Lacke, Schwefelsaures Kali, Chlorkalium, Sonstige chemische u. pharmazeutische Erzeugnisse, Kalisalze, Thomasphosphatmehl, Schwefelsaures Ammoniak, Sonstige chemische Rohstoffe und Halbzeuge*

Textiles: *Kunstseide und Forettseidengarn, Garn aus Wolle u. anderen Tierhaaren, Garn aus Baumwolle, Garn aus Flaschs, Hanf, Jute u. dergl., Gewebe u. and. nicht genähte Waren aus Seide und Kunstseide, Wolle u. and. Tierhaaren, Baumwolle, Flachs, Hanf, Jute u. dergl., Sonstige Textilwaren*

Paper: *Papier und Papierwaren, Bücher und Musiknoten*

Leather: *Leder, Schuhwerk, Sattler- u. and. Lederwaren*

Rubber and asbestos: *Kautschukwaren, Harz, Kopale, Schellack, Gummi, Kautschuk, Guttapercha, Balata*

Woodworking: *Bau- und Nutzholz, Holz zu Holzmasse, Holzschliff, Zellstoff usw., Gerbhölzer, -rinden und -auszüge, Möbel und Holzwaren*

Musical instruments and toys: *Musikinstrumente, Phonographen u. dergl., Kinderspielzeug*

Food and beverages: *Lebensmittel und Getränke* (without *Fische und Fischzubereitungen*)

Clothing: *Kleidung und Wäsche, Filzhüte und Hutstumpen*

Other: *Baumwolle, Flachs, Hanf, Jute u. dergl., Hopfen, Rohtabak, Nichtölhaltige Sämereien, Ölfrüchte und Ölsaaten, Ölkurchen, Kleie und ähnliche Futtermittel, Eisenhalbzeug, Rohluppen, Sonstige Rohstoffe und halbfertige Waren, Pelze und Pelzwaren, Paraffin und Waren aus Wachs oder Fetten, Celluloid, Galalith u. dergl., Waren daraus (o. Filme), Filme, belichtet und unbelichtet, Ton- und Porzellanwaren*

(außer Ziegeln, Glas und Glaswaren, Sonstige fertige Waren, Gold und Silber, nicht bearbeitet, Gold- und Silbermünzen

A.2 The Maximum Likelihood estimation: an example

I here present an example of how the parameters of interest are calculated following chapter 10 of King's book.[1]

Figure A.1 shows what the initial set of linear equations looks like for the agricultural voter turnout in the 1930 election. Each line represents one district. The circles in the left half of figure A.2 are a two-dimensional top-down illustration of the distribution based on the estimated parameters, from which all districts are assumed to be drawn. They are comparable to altitude lines in cartography and correspond to the density plot pictured to the right with the center of the circles being equivalent to the mode of the distribution. Each linear relationship depicted in the graph corresponds to one district.

We use the likelihood function

$$L(\breve{\psi}|T) \propto \prod_{X_i \in (0,1)} P(T_i|\breve{\psi}) = \prod_{X_i \in (0,1)} N(T_i|\mu_i, \sigma_i^2) \frac{S(\breve{\mathfrak{B}}, \breve{\Sigma})}{R(\breve{\mathfrak{B}}, \breve{\Sigma})} \tag{A.1}$$

and estimate it based on the available data for X_i and T_i.[2] In order to compensate for correlation between $\breve{\mathfrak{B}}$ and σ_b^2, King suggests using a modified ratio of the two variables instead. He also uses the log of $\breve{\sigma}$ which make the

1. G. King, *A solution to the ecological inference problem: Reconstructing individual behavior from aggregate data* (Princeton University Press, 1997), 199.

2. ψ is the parameter of interest. T_i is the turnout variable in district i. X_i is the number of agricultural workers in district i. $N(T_i|\mu_i, \sigma_i^2)$ is a normal distribution with mean μ and variance σ^2. R is the "normalising constant for the truncated bivariate normal". S is the "fraction of an untruncated normal distribution falling above the line segment for one precinct in a tomography plot." $\mathfrak{B}$ is the expected value of β_i. A breve indicates the untruncated version of the model.

Figure A.1: Tomography plot for the agricultural voter turnout in the 1930 election

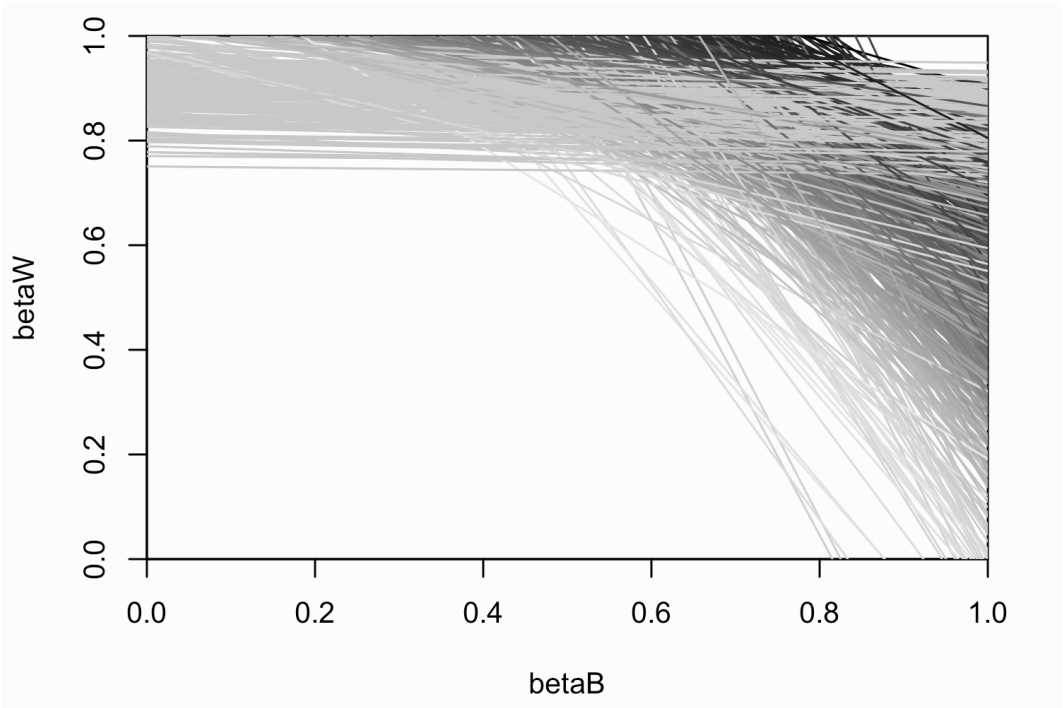
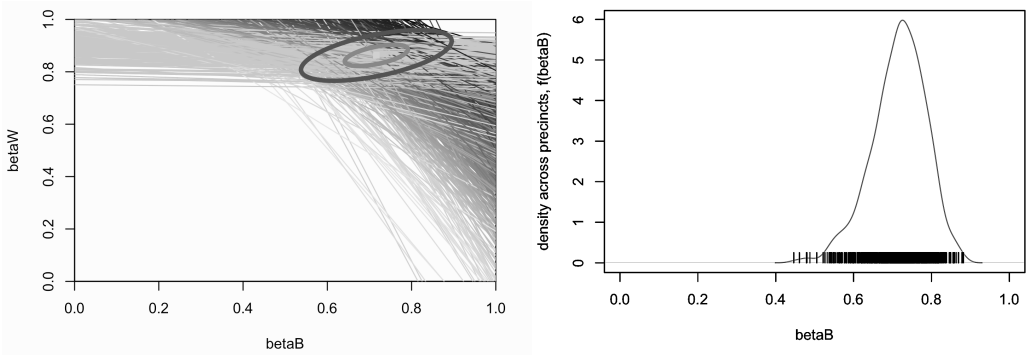


Figure A.2: Tomography plot with distribution contour lines (left) and density plot with point estimates (right)



variable "unbounded and more symmetric."[3] This yields a vector of modified parameters ϕ_1 to ϕ_5 which needs to be reparameterised post-estimation to

$$\psi = \begin{bmatrix} \hat{\mathfrak{B}}^j \\ \hat{\mathfrak{B}}^{-j} \\ \hat{\sigma}_j \\ \hat{\sigma}_{-j} \\ \hat{\rho} \end{bmatrix} = \begin{bmatrix} \phi_1(0.25 + \sigma_j^2) + 0.5 \\ \phi_2(0.25 + \sigma_{-j}^2) + 0.5 \\ e^{\phi_3} \\ e^{\phi_4} \\ \frac{e^{2\phi_5}-1}{e^{2\phi_5}+1} \end{bmatrix} = \begin{bmatrix} 0.6909 \\ 0.8618 \\ 0.1097 \\ 0.0436 \\ 0.3328 \end{bmatrix} \tag{A.2}$$

where the sigmas represent the standard errors and ρ is the correlation between the variables of interest.

The distribution is then transformed from its untruncated to a truncated form by "drawing a large number of values from the truncated bivariate normal distribution, using the untruncated normal parameters, and then taking the means, variances, and correlation."[4] Truncation is necessary because the values of the distribution logically cannot fall outside of the range between 0 and 1 (nor outside of the bounds defined by the accounting identity between aggregated and disaggregated turnout). If the mean of β falls very centrally within its bounds truncation only has a small effect on the parameters because only a small area of the distribution falls outside the bounds. However, if the mean is close to one of the bounds, the untruncated distribution will inevitably lead to bias.

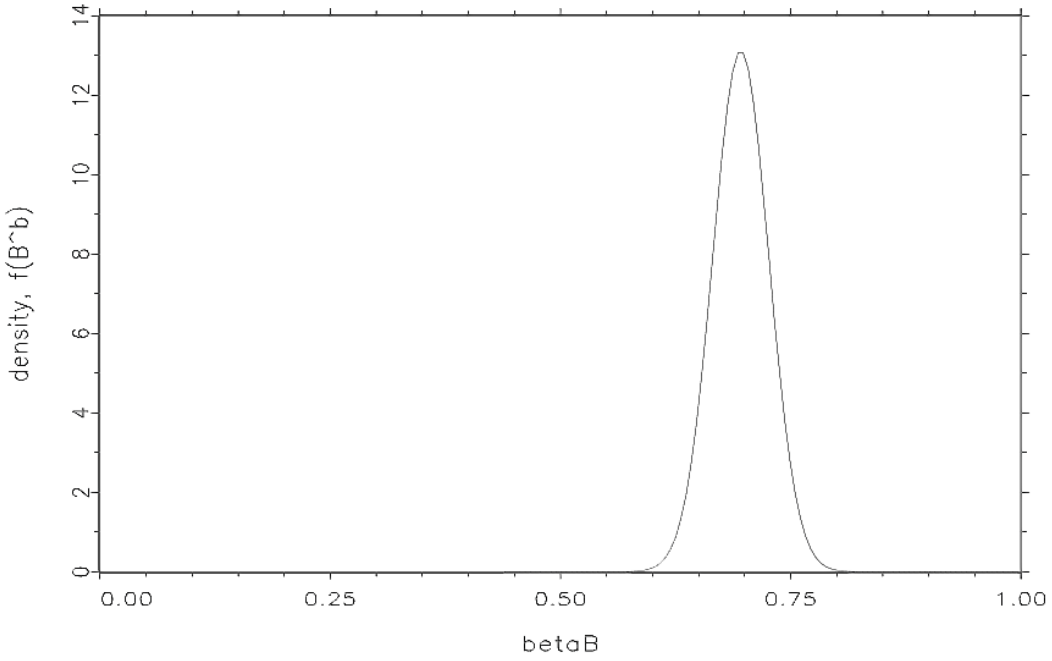
The result is the vector of truncated ψ values:

$$\psi = \begin{bmatrix} \hat{\mathfrak{B}}^j \\ \hat{\mathfrak{B}}^{-j} \\ \hat{\sigma}_j \\ \hat{\sigma}_{-j} \\ \hat{\rho} \end{bmatrix} = \begin{bmatrix} 0.6910 \\ 0.8612 \\ 0.1081 \\ 0.0431 \\ 0.3314 \end{bmatrix} \tag{A.3}$$

3. King, *A solution to the ecological inference problem: Reconstructing individual behavior from aggregate data*, 136.

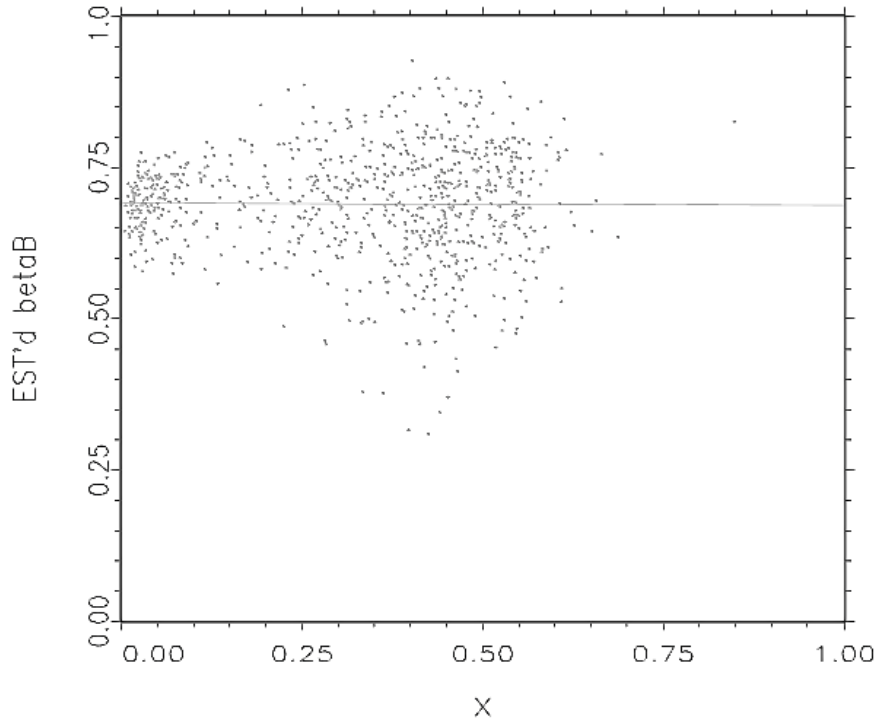
4. Ibid., 204.

Figure A.3: Posterior distribution of the aggregate value of β_j



Based on these parameters we can now simulate 100 random sample draws from the distribution. We can do this at the aggregate nation-wide level by using population-weighted means of the parameters (we do have the population of each district N_i) or for each district separately. The mean of this sample will give us the an approximation for the quantity of interest for β_j. The resulting posterior distribution at the aggregate level is depicted in figure A.3. The estimated aggregate value for β_j in this case is 0.6957 with a standard error of 0.0049. By using King's algorithm of ecological inference, we have therefore estimated that the voter turnout among those employed in agriculture was about 69 %, compared to the rest of the population where it was much higher at 86 %. Figure A.4 shows a scatterplot of all point estimates of β^j at the district level plotted by agricultural population X.

Figure A.4: Posterior distribution of β_j (y axis) : point estimates at district level (agricultural population share on the x axis)



A.3 Trade exposure relative to overall production

So far we have looked at the trade balance as the predictor of voting behaviour. However, it is possible that a sector has a high trade surplus or deficit with only a small fraction of its overall production being exported or imported. In that case trade policy may matter very little to individuals employed in this sector. In the next step, I therefore incorporate data on the export share of industrial production from a 1930s publication by Wagemann.[5] The data are based on the year 1934, but the author argues that while export dependence decreased in absolute terms by as much as a third during the Great Depression (from 21% of production to 13%), there was little change

5. E. Wagemann, ed., *Die Bedeutung des Außenmarktes für die deutsche Industriewirtschaft*, Sonderhefte des Instituts für Konjunkturforschung 41 (Berlin: Hanseatische Verlagsanstalt Hamburg, 1936), 12.

in relative terms between sectors since 1928.[6] The export dependence in percent of production is available at the same level of aggregation as the employment data. It ranges from 0 % in construction and utilities to 49 % in musical instruments and toys. Figure A.5 shows the estimated vote shares from the previous section, but this time plotted against these export dependency ratios. While there is no clear trend visible in the 1924 elections, a negative correlation emerges as trade policy becomes more important in the 1928 and 1932 elections (but not the 1930 election).

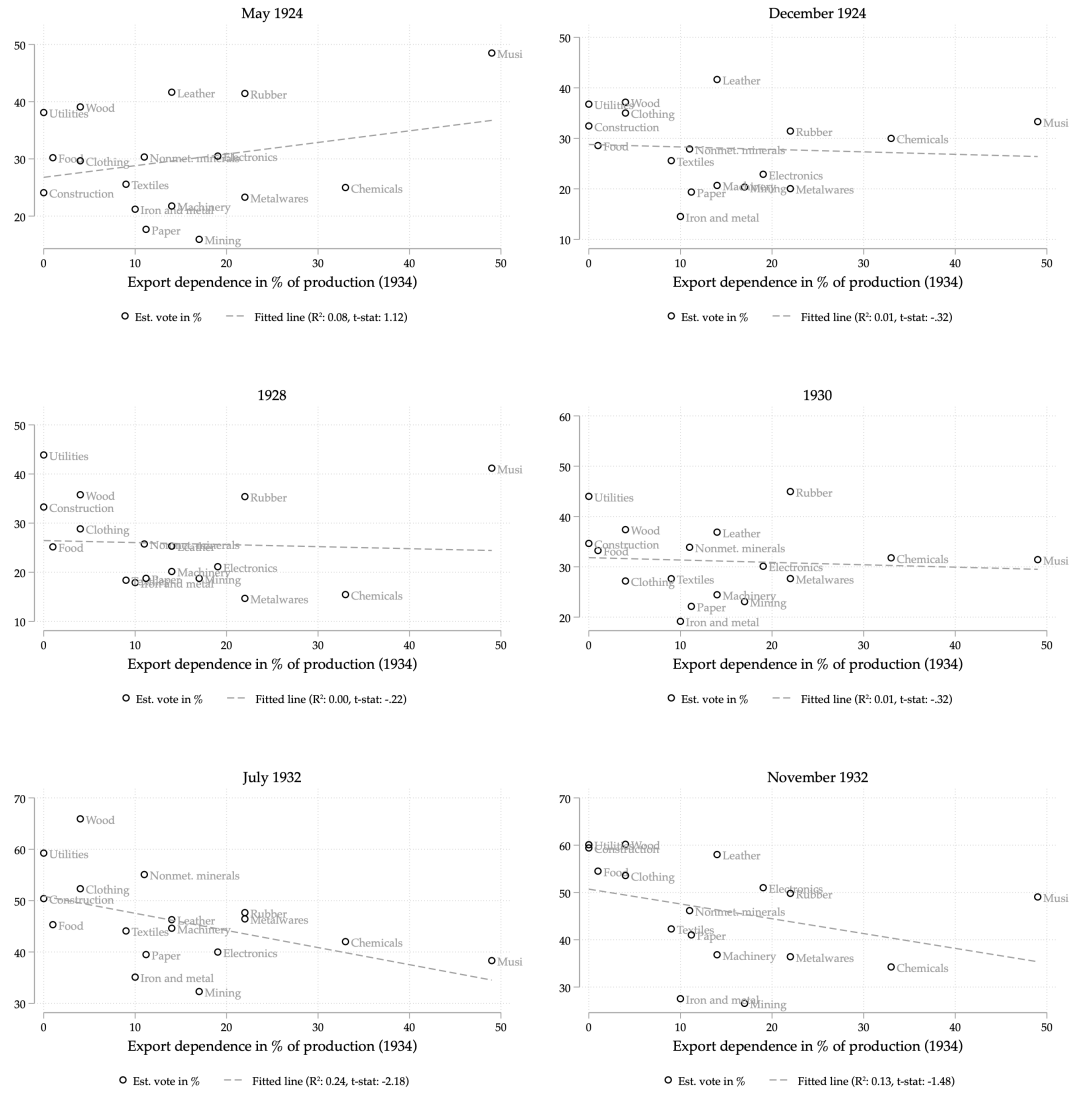
A.4 Import prices and Protectionism

The Great Depression is a time of rapidly falling prices. Does this affect the protectionist attitude of sectors? One might assume, for instance, that a sector that was facing a bigger price drop was more protectionist than one that faced only a moderate drop because the sector wanted to keep domestic prices above the global level.

Using the same categorisation of goods as in the calculation of trade balances, I calculate log import price changes from 1929 to 1932 for each sector. This is possible because the German trade statistics report both trade volumes in kilogram and values in Reichsmark. The resulting scatter plots are shown in figure A.6. Again there is a lot of variation between sectors, from a 123 % drop in rubber prices to a 5 % increase in prices for electronics. There was a weak correlation between import price drops and support for protectionist parties, especially in the November 1932 and 1933 elections. The correlation is negative as expected: Sectors facing a severe price drop like rubber and clothing leaned more protectionist than a sector like mining, which operated close to a trade balance of zero (see figures above), but was less reliant on protectionist policies as it faced a much more moderate drop in import prices.

6. Wagemann, *Die Bedeutung des Außenmarktes für die deutsche Industriewirtschaft*, 11.

Figure A.5: Estimated industrial sector votes for protectionist parties and export dependence

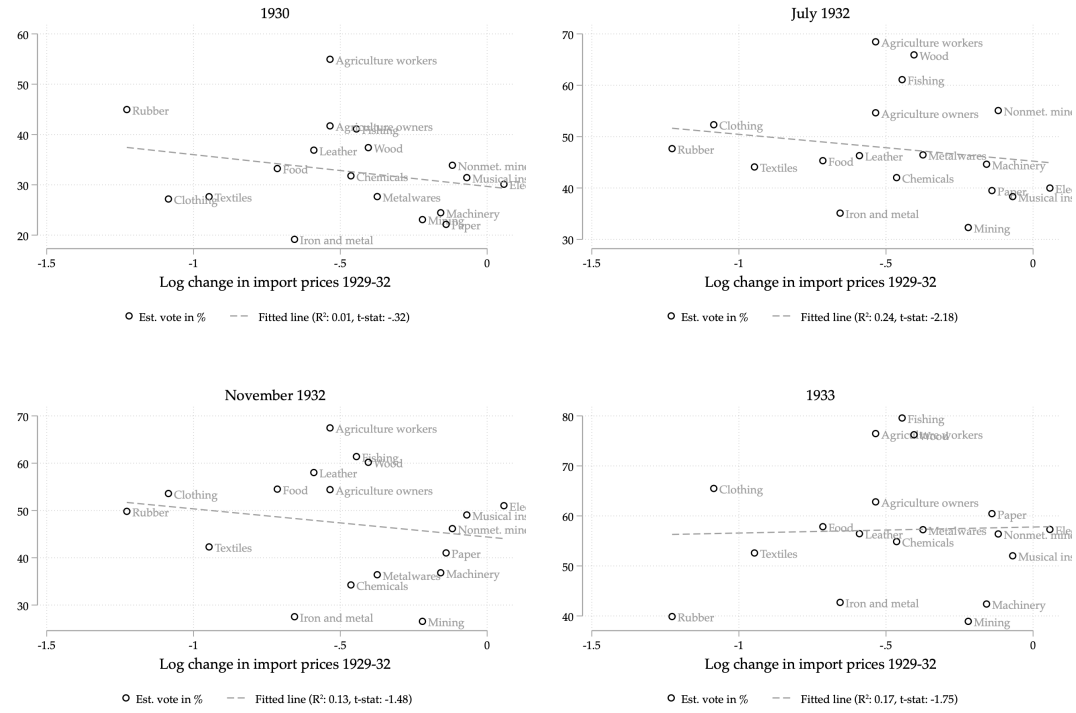


A.5 Ecological inference estimates by sector

A.6 Further regression tables

Tables A.2 and A.3 show regression results for the share of the total farm land that is part of farms smaller than 5 hectares. The effect is consistently negative relative to bigger farms but appears to get smaller over time suggesting

Figure A.6: Estimated industrial sector votes for protectionist parties and log change in import prices



that the division between small peasant farms and large estates shrinks as the crisis became more severe.

A.6.1 Could the Nazis capture the Protectionist Vote?

So far we have considered all protectionist parties as one homogenous group, but they differed a lot on the specifics of their policy agenda. The Nazis in particular campaigned on a platform of radical autarky in the last free elections of the Weimar Republic. If they were able to position themselves as the voice of protectionism, we should see a strong correlation between trade exposure and votes for the Nazis in the later elections, but not necessarily in the earlier ones when protectionist voters still favoured the DNVP and other, smaller parties. We see in figure A.7 that this is indeed the case. The graph depicts the estimated vote for only the Nazis in the elections between

Table A.1: Estimates of protectionist vote shares by election and sector in %

sector	M. 1924	D. 1924	1928	1930	J. 1932	N. 1932	1933
Agriculture owners	0.39	0.37	0.38	0.42	0.55	0.54	0.63
Agriculture workers	0.52	0.51	0.52	0.55	0.68	0.67	0.76
Fishing	0.49	0.43	0.23	0.41	0.61	0.61	0.80
Mining	0.16	0.20	0.19	0.23	0.32	0.27	0.39
Nonmet. minerals	0.30	0.28	0.26	0.34	0.55	0.46	0.56
Iron and metal	0.21	0.15	0.18	0.19	0.35	0.28	0.43
Metalwares	0.23	0.20	0.15	0.28	0.46	0.36	0.57
Machinery	0.22	0.21	0.20	0.24	0.45	0.37	0.42
Electronics	0.30	0.23	0.21	0.30	0.40	0.51	0.57
Chemicals	0.25	0.30	0.15	0.32	0.42	0.34	0.55
Textiles	0.26	0.26	0.18	0.28	0.44	0.42	0.53
Paper	0.18	0.19	0.19	0.22	0.39	0.41	0.60
Leather	0.42	0.42	0.25	0.37	0.46	0.58	0.56
Rubber	0.41	0.31	0.35	0.45	0.48	0.50	0.40
Wood	0.39	0.37	0.36	0.37	0.66	0.60	0.76
Musical instruments	0.49	0.33	0.41	0.31	0.38	0.49	0.52
Food	0.30	0.29	0.25	0.33	0.45	0.55	0.58
Clothing	0.30	0.35	0.29	0.27	0.52	0.54	0.65
Utilities	0.38	0.37	0.44	0.44	0.59	0.60	0.68
Construction	0.24	0.32	0.33	0.35	0.50	0.59	0.63
Trade	0.37	0.28	0.27	0.39	0.53	0.47	0.62
Insurance	0.31	0.39	0.20	0.54	0.53	0.43	0.66
Transport	0.36	0.33	0.24	0.38	0.48	0.50	0.61
Hospitality	0.33	0.32	0.33	0.42	0.50	0.57	0.77
Administration	0.36	0.36	0.29	0.42	0.52	0.54	0.66
Healthcare	0.26	0.19	0.23	0.26	0.50	0.43	0.67
Domestic Service	0.36	0.28	0.30	0.36	0.48	0.50	0.67

1928 and 1932. The correlation between trade balance and Nazi vote was still positive in the earlier two elections, but by 1932 had become negative (although the correlation is not very strong).

Table A.2: Weighted least squares regressions using land concentration for farm workers

VARIABLES	(1) M. 1924	(2) D .1924	(3) 1928	(4) 1930	(5) J. 1932	(6) N. 1932	(7) 1933
Share farms <5ha	-0.434***	-0.337***	-0.404***	-0.281***	-0.0232	-0.255***	-0.246***
	(0.0761)	(0.0702)	(0.0821)	(0.0720)	(0.0634)	(0.0668)	(0.0492)
% Catholic	-2.02e-06***	-2.30e-06***	3.88e-07	-6.95e-07**	-1.74e-06***	-9.41e-07***	8.34e-08
	(3.03e-07)	(2.84e-07)	(3.17e-07)	(2.91e-07)	(2.85e-07)	(2.97e-07)	(2.13e-07)
Population	1.83e-05***	6.09e-06	-5.01e-06	2.43e-06	6.75e-07	6.09e-06	-7.32e-06*
	(5.85e-06)	(5.36e-06)	(5.88e-06)	(5.42e-06)	(5.07e-06)	(5.50e-06)	(3.98e-06)
Pop. Density	0.000492	0.000215	0.000822	0.000642	0.000227	8.39e-05	0.000240
	(0.000648)	(0.000524)	(0.000609)	(0.000539)	(0.000517)	(0.000559)	(0.000367)
Constant	1.636***	1.062***	1.222***	1.611***	1.134***	0.824***	1.274***
	(0.105)	(0.150)	(0.140)	(0.161)	(0.142)	(0.129)	(0.162)
Observations	821	821	820	821	821	821	820
R-squared	0.222	0.162	0.097	0.098	0.074	0.055	0.068

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls: Number of self-employed, manual workers, clerical workers, supporting family members, unemployed, electoral turnout. Dependent variable: Vote share of protectionist parties among farm workers

Table A.3: Weighted least squares regressions using land concentration for farm owners

VARIABLES	(1) M. 1924	(2) D .1924	(3) 1928	(4) 1930	(5) J. 1932	(6) N. 1932	(7) 1933
Share farms <5ha	-0.419***	-0.313***	-0.548***	-0.282***	-0.175***	-0.308***	-0.449***
	(0.0641)	(0.0601)	(0.0744)	(0.0574)	(0.0611)	(0.0672)	(0.0580)
% Catholic	-2.16e-06***	-1.39e-06***	4.51e-07	-6.35e-07***	-1.09e-06***	-5.76e-07*	-2.87e-07
	(2.56e-07)	(2.43e-07)	(2.87e-07)	(2.32e-07)	(2.75e-07)	(2.99e-07)	(2.51e-07)
Population	1.12e-05**	1.19e-05***	-4.09e-07	1.12e-05***	4.61e-06	5.21e-06	-3.92e-06
	(4.94e-06)	(4.59e-06)	(5.33e-06)	(4.32e-06)	(4.88e-06)	(5.53e-06)	(4.69e-06)
Pop. Density	0.000671	0.000355	0.000656	0.000560	0.000320	0.000186	0.000289
	(0.000546)	(0.000449)	(0.000552)	(0.000430)	(0.000498)	(0.000562)	(0.000433)
Constant	1.849***	0.618***	1.100***	1.669***	0.932***	0.886***	1.495***
	(0.0882)	(0.128)	(0.127)	(0.128)	(0.137)	(0.130)	(0.191)
Observations	821	821	820	821	821	821	820
R-squared	0.317	0.143	0.114	0.162	0.056	0.063	0.152

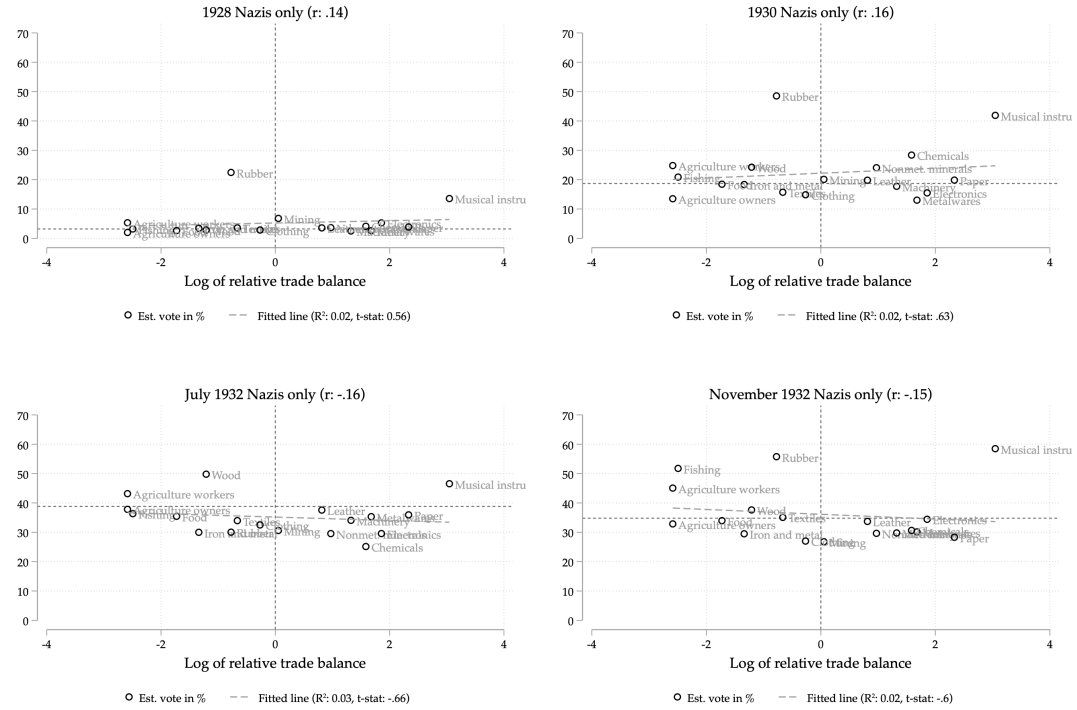
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls: Number of self-employed, manual workers, clerical workers, supporting family members, unemployed, electoral turnout. Dependent variable: Vote share of protectionist parties among farm owners

Table A.4: Weighted least squares regressions for the overall protectionist vote

VARIABLES	(1) M. 1924	(2) D .1924	(3) 1928	(4) 1930	(5) J. 1932	(6) N. 1932	(7) 1933
Cattle per ha	-0.0969***	-0.0236	0.0996***	-0.0728***	-0.00282	0.0305	0.00213
	(0.0271)	(0.0266)	(0.0286)	(0.0227)	(0.0234)	(0.0248)	(0.0221)
Pigs per ha	-0.122***	-0.0921***	-0.132***	-0.0415**	-0.0637***	-0.0922***	-0.0867***
	(0.0198)	(0.0192)	(0.0203)	(0.0166)	(0.0178)	(0.0189)	(0.0168)
% Catholic	-5.93e-07***	-3.82e-07***	-2.26e-07***	-3.08e-07***	-4.28e-07***	-4.04e-07***	-3.95e-07***
	(6.55e-08)	(6.53e-08)	(6.76e-08)	(5.23e-08)	(5.59e-08)	(6.13e-08)	(5.34e-08)
Pop. Density	-0.000610***	-0.000615***	-0.000587***	-0.000425**	-0.000321*	-0.000291	-0.000397**
	(0.000206)	(0.000206)	(0.000216)	(0.000176)	(0.000185)	(0.000195)	(0.000176)
Population	1.90e-05***	1.76e-05***	1.70e-05***	1.03e-05***	1.13e-05***	1.25e-05***	1.21e-05***
	(4.43e-06)	(4.43e-06)	(4.66e-06)	(3.80e-06)	(4.00e-06)	(4.23e-06)	(3.84e-06)
Constant	1.047***	0.440***	0.332***	1.198***	0.686***	0.552***	1.068***
	(0.0692)	(0.0885)	(0.0810)	(0.0842)	(0.0955)	(0.0851)	(0.147)
Observations	821	821	821	821	821	821	821
R-squared	0.328	0.230	0.223	0.269	0.251	0.230	0.281

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Controls: Number of self-employed, manual workers, clerical workers, supporting family members, unemployed, electoral turnout. Dependent variable: Vote share of protectionist parties

Figure A.7: Estimated industrial sector votes for the Nazi party and log of relative trade balance



B

Appendix to Chapter 4

B.1 Alternative start and end dates

In the main body of the chapter I use the years 1929 and 1933 as the cutoff points for the interwar trade decline since this allows for a more direct comparison to the same years in the United Kingdom and encapsulates the bulk of the decline. However, German imports already peaked in 1927 and German exports did not reach their nadir until 1934. I therefore also reproduce the graphs for the decline in imports between 1927 and 1929 as well as between 1927 and 1931 as an expanded first phase of the import contraction, and for the decline in imports from 1933 to 1934 and 1931 to 1934 as an expansion of the second phase of the export contraction. This expansion does not alter the results of the chapter, as shown in figure B.1. This is expected since the change in trade values for these years is fairly

small. Imports in this early period only fell for industrial goods – both durable and nondurable – as well as food.

The graphs for exports up to 1934 show a very similar pattern to that for the 1931-33 period. In both cases the relationship is inverted relative to the GTC in 2009. Nondurable consumer goods and food were among the categories with the biggest drop. Aircraft exports dropped the least. Industrial goods, both nondurable and durable, capital goods, and durable consumer goods also fell, but by a smaller margin. From 1933 to 1934 this decline amounted to slightly more than 10 % in all of these categories.

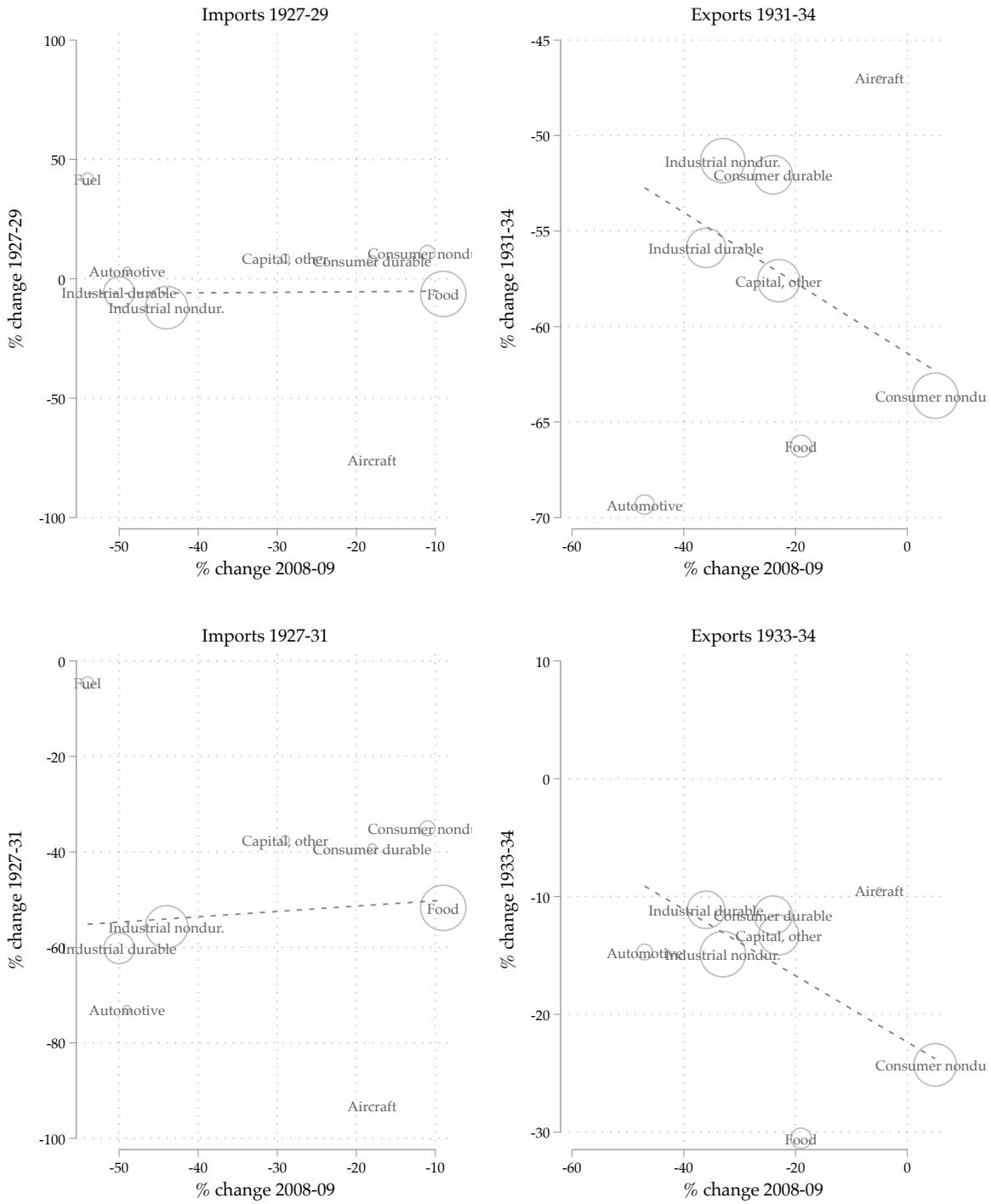
B.2 Adjusting for reparations

The official German trade statistics include reparations in kind on the export side until 1931. To ensure that the export data is not biased because of this, I have collected data on reparations by goods category separately and subtract the value of the reparations from the export value in 1929 and 1931. Figure B.2 shows the distribution of reparations across categories and the share of exports that reparations account for.[1] In-kind reparations were concentrated in the categories of machinery, ironwares, and fossil fuels. Coal (tariff number 238a) was the category with the highest value among the 1929 reparations at 208.1 million RM and reparations accounted for 39 % of the total value of coal exports in that year. Reparations made up more than 5 % of total German exports each year between 1925 and 1930.[2] The main recipient in 1929 was France, followed by Italy, Belgium, and Yugoslavia. By the summer of 1932 Germany ceased to pay reparations after the Lausanne Conference

1. Statistisches Reichsamt, *Der Auswärtige Handel Deutschlands im Jahr 1929*; Statistisches Reichsamt, *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember*.

2. Author's own calculations based on Länderrat des Amerikanischen Besatzungsgebietes (*Statistisches Handbuch von Deutschland 1928-1944*).

Figure B.1: The trade collapse by category



so that data for subsequent years is not affected by this distortion.[3] Figures

3. While Germany still paid reparations in the first half of 1932, it last paid *in-kind* reparations in 1931 according to the German balance of payments (see Länderrat des Amerikanischen Besatzungsgebietes (*Statistisches Handbuch von Deutschland 1928-1944*, 602))

B.3 shows that the differences between the first and second half of the trade collapse hold up although they are less pronounced.

Figure B.2: Tree map of in-kind reparations payments in 1929 by categories of the German tariff code

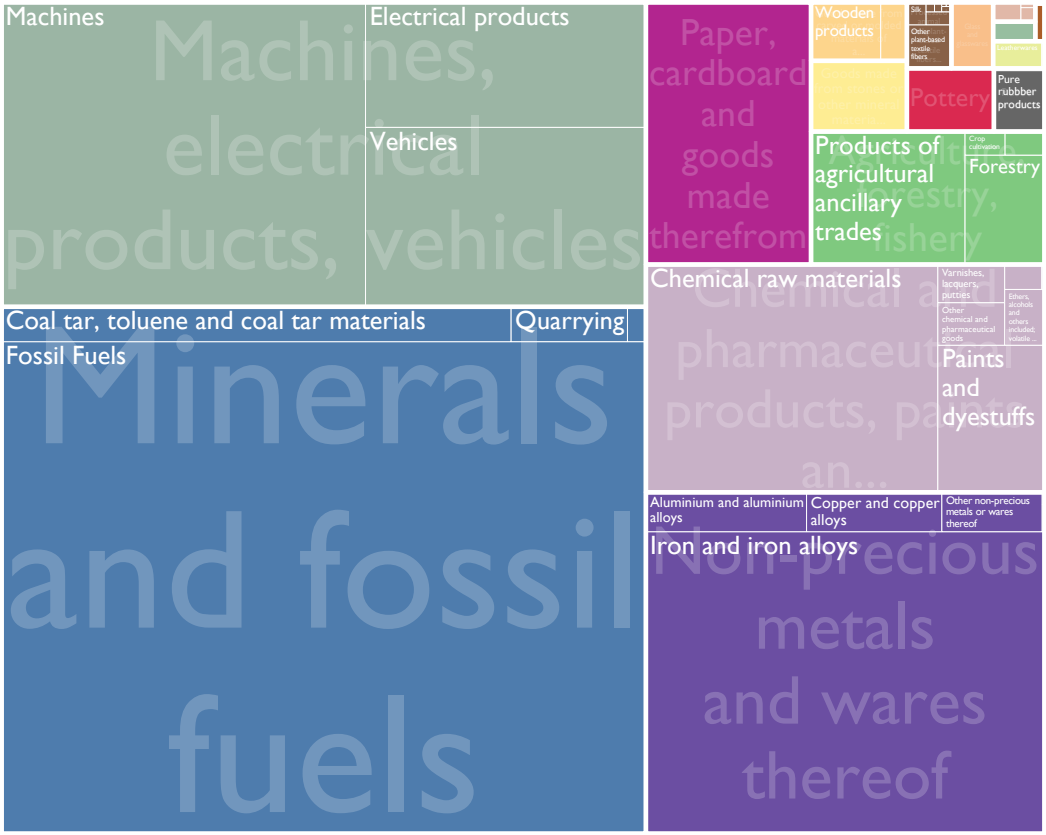
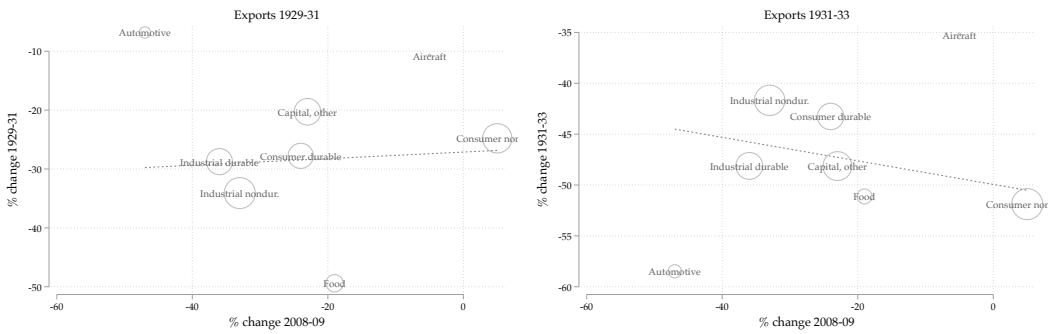


Figure B.3: The decline in exports net of reparations in the Great Depression compared to 2008-09



B.3 Countries and territories included in the sample

Table B.1 shows the countries and territories that are included in the sample of German import varieties. The sample covers trade with all continents and a range of industrialised and agrarian economies.

Table B.1: Countries and territories included in the sample of German trade

Algeria	Argentina	Australia
Belgium & Luxemburg	Brazil	British India
British South Africa	British Malaya	Canada
Chile	China	Columbia
Cuba	Danzig	Denmark
France	United Kingdom	Hong Kong
Italy	Japan	Yugoslavia
Canary Islands	Former German Southwest Africa	Mexico
New Zealand	Undetermined	Dutch America
Netherlands	Dutch East Indies	Norway
Persia	Poland	Romania
USSR	Sweden	Switzerland & Liechtenstein
Spain	Czechoslovakia	Turkey
Hungary	Venezuela	United States of America
Egypt	Austria	Other America
Other British America	Other not specifically named countries and territories	

Table B.2: Unit value changes for manufactures further disaggregated

	1929-31					
	Exports			Imports		
	All	Non-diff.	Diff.	All	Non-diff.	Diff.
Manufactures						
Consumption, non-durable	-17.1	-6.6	-17.9	-12.7	-6.4	-15.5
Intermediate, non-durable	-17.1	-10.6	-24.0	-21.6	-11.1	-30.4
Capital, durable	-5.3	NA	-5.3	2.9	NA	2.9
Consumption, durable	-9.3	NA	-9.3	-8.7	NA	-8.7
Intermediate, durable	-13.5	-40.7	-12.3	-9.9	-21.2	-8.2
	1931-33					
Manufactures						
Consumption, non-durable	-25.2	-18.4	-25.3	-25.2	-17.3	-26.1
Intermediate, non-durable	-22.3	-22.3	-22.3	-30.5	-27.8	-32.2
Capital, durable	-16.3	NA	-16.3	-18.5	NA	-18.5
Consumption, durable	-17.7	NA	-17.7	-13.7	NA	-13.7
Intermediate, durable	-18.6	-34.3	-18.1	-21.8	-30.1	-19.8

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
1	Rye
2a	Wheat
2b	Spelt
3a	Barley for animal feed
3b	Other barley
3	Barley
4	Oats
7	Corn, Sorghum bicolor
10	Rice unpolished
13a	Rape, turnips
13b	Yolk, oil radish, runch seed
13c	Mustard
14	Poppy, sunflower, Madia-, kapok, niger seed, Behen nuts, beechnuts, tiger nuts, peanuts, laurels, sesame
14a1	Poppy
14a2	Sunflower seeds
14b1	Madia-, kapok, niger seed, Behen nuts, tiger nuts, laurels
14b2	Beechnuts
14c	Peanuts
14c1	Peanuts in shell
14c2	Peanuts peeled

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
14d	Sesame
15a	Flax seed, flax seed meal
15b	Hempseed
16a	Cottonseed
16b1	Soybeans
16b2	Mowra seed, Elipe-, Schi, African tallow nuts, castor, Stillingia seeds, butter beans
16c	Palm kernels
16d	Copra
17	Fat muscat, wood oil, Kula nuts, pumpkin seeds and other oil seeds and grains
28a	Cotton
28b	Crop residues of raw cotton (linters)
29	Tobacco leaves, untreated (raw tobacco); waste thereof
34	Mate (Paraguayan), laurel, sage leaves, marjoram, woodruff and other leaves and herbs used for flavouring
61a	Coffee, raw
61b	Coffee, not raw
61c	Coffee powder, mixed with sugar; Coffee essence; Extension, syrupy concentrated raw coffee cups
65	Tea
98a	Rubber, raw or cleaned
98b	Gutta-percha, raw or cleaned
98c	Balata, raw or cleaned
98d	Rubber, gutta-percha u. Balataabfälle, worn pieces of goods of rubber, gutta-percha, balata
98e	Oil-based rubber and other rubber subsitutes
106	Pigs
106b	Pigs
108a	Beef (veal), fresh, also chilled, frozen, simply prepared
108a1	Beef (veal), fresh
108a2	Beef (veal), edible viscera (liver, etc.), chilled, frozen
108a3	Beef (veal), other meat, chilled, frozen
108b	Simply prepared beef (veal)
108c	Pork: fresh, not chilled, frozen or simply prepared
108c1	Pork: fresh
108c2	Pork: edible viscera (liver, etc.), chilled, frozen
108c3	Pork, other meat, chilled, frozen
108d	Pork, simply prepared, whether or not chilled
108e	Pork ham, salted, smoked
108f	Sheep, goat meat, etc. , fresh or simply prepared
108f1	Sheep meat: fresh or simply prepared
108f2	Sheep meat, chilled, frozen
109	Pig fat, fresh or simply prepared; Pepper bacon [included here, since It Seems to be less than chilled and frozen]

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
109a	Pig fat, fresh or simply prepared; Pepper bacon
109b	Pig fat, chilled, frozen
110	Goose breasts, thighs, livers; Poultry, slaughtered, cut, peppered or otherwise prepared
110a	Goose breasts, thighs, livers
110b	Poultry slaughtered, even broken, dotted or otherwise prepared; edible guts of it
111	Ground game, dead, broken, cooked; edible guts of it
112	Game birds, dead, cut, cooked; edible guts of it
134	Milk butter, clarified butter
136	Eggs of poultry and game birds
137	Egg yolks, punched eggs
138	Eggwhite, liquid
144a	Sheep's wool (including tanner's wool), raw waste thereof; Merino wool
144b	Sheep's wool (including tanner's wool), raw waste thereof; Merino wool: back wash
144c	Sheep's wool (including tanner's wool), raw waste thereof; Merino wool: washed after shearing (Factory washing, hand-washed wool)
144d	Sheep's wool (including tanner's wool), raw waste thereof; Cross breeding wool
144e	Sheep's wool (including tanner's wool), raw waste thereof; Cross breeding wool, back wash
144f	Sheep's wool (including tanner's wool), raw waste thereof; Cross breed wool: washed after shearing (Factory washing, hand-washed wool)
145a1	Hair, unworked, whether boiled: llama or camel hair
145a2	Hair, unworked, whether boiled: goat hair
145b	Hair, unworked, whether boiled: hare, rabbit, beaver, monkey, muskrat, nutria
145c	Hair, unworked, whether boiled: from cattle, deer, dogs, pigs and similar coarse animal hair
146	Horse hair (from the mane order the tails), also boiled
152	Silk housing (silk cocoons)
153a	Calf skins, raw: green, salted (wet)
153b	Calfskins: limed, dried (dry)
153c	Cowhides (young cattle, calf, cow, ox, bull, buffalo hides), raw: green, salted
153d	Cattle hides (young cattle, calf, cows, ox, bull, buffalo skins), crude: limed, dried
153e	Horse skins, raw: green, salted (wet): Whole hides
153f	Horse skins, raw: green, salted (wet): Ross necks
153g	Horse skins, raw: green, salted (wet): Ross Signs
153h	Horse skins, raw: limed, dried (dry): Whole hides
153i	Horse skins, raw: lime, dried (dry): Horse necks
153k	Horse skins, raw: lime, dried (dry): Horse Signs
153l	Lamb skins, raw, hairy
153m	Sheepskins, raw, hairy
153n	Lamb and sheep skins, raw, whether or not split
153o	Crude, also split, goatskins
153p	Crude, also split, Zickelfelle
153q	Fish and reptile skins, raw

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
153r	Deer, donkeys, mules, wild boar, seal, presents seal, etc. Hides and skins for leather, raw, even without hair on (pelts), also split
153s	Glue stock
163	Rice, polished
166a	Rapeseed and rapeseed oil
166b	Linseed oil
166c	Bean oil (soya and others)
166d	Peanut oil
166e	Sesame oil
166f	Tree (olive) oil
166g	Lavat- and Sulfuröl
166h	Cottonseed oil
166i	Wood oil
166k	Castor oil
166l	Beech nut, claw, bone, corn, poppy, Niger, sunflower, bacon and other fatty oil
167	Tree, sesame, peanut, rapeseed oil and other fatty oils in metal vessels and other containers than in barrels, tank cars or tankers
169	Nutmeg butter (Balsam nutmeg); Bay oil, buttery
171a	Palm oil (butter, fat)
171b	Palm kernel oil (-nussöl, -kernfett)
171c	Coconut oil (cocoa butter, vegetable fat, coconut butter, coconut tallow)
171d	Mowra oil, shea butter, Vateria- and other plant tallow (vegetable fats)
176a	Cane sugar
176b	Beet sugar: granulated sugar (granulated), also brown sugar
176c	Beet sugar: plates, rods, cubes of sugar
176d	Beet sugar: ground Melis
176e	Beet sugar: sugar cubes, crumbs sugar
176f	Rübenzucher: ground, refined
176g	Beet sugar: bread sugar
176h	Beet sugar: Farin
176i	Beet sugar: Kandis
176k	Cane sugar, crude, solid and liquid
176l	Beet sugar, crude, solid and liquid
176m	Other solid and liquid sugar (e. G. , liquid refined)
176n	Filling mass, sugar sequences (syrup), beet juice, maple sap
176o	Molasses and mollases-based feed
177a	Starch sugar, fruit sugar and other fermentable sugars not mentioned; Dextrin sirup, burned sugar
177b	Coloring sugar, sugar colors
177c	Lactose
220a	Processed tobacco leaves, waste of tobacco products
220b	Tobacco stems and tobacco stalks

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
227d	Lime, natural Phosphoric acid (e. G. , phosphorite, apatite, Kproplith, Navassit, Smbrerit, Iceland guano), including artificial
228	Gypsum (calcium sulphate); Super phosphogypsum
238a	Coal, anthracite, unprocessed kennel coal
238b	Brown coal
238c	Peat; Peat coke (Torfkohlen), fuels, artificial, of peat
238d	Coke
238e	Pressed stone coal
238f	Pressed lignite (also wet pressed stones)
238g	Coke-like residue; Fuels, artificial (fire starter, etc.), except press coals from lignite or hard coal
238h	Coal, moldable materials, or of gas from fossil carbon (graphite retort), unformed; moldable biochar in unshaped mass
239c	Naphtha; Cleaning oil; Patentterpentinöl
239b	Gasoline of all kinds, including Terpentine substitutes
239f	Heating oil
239g	Lignite, shale, turf tar oil, previously not included; retinol
239h	Tar-like, waxy and non-sinking residue from the distillation of mineral oils
239a	Petroleum, crude; Mountain (earth) tar, natural, liquid
239a	Lubricating oils, mineral (lubricant, paraffin, vaseline, volcanic oil, etc.)
239b	Petrol, gasoline, naphtha, and other petroleum ether, other light refined mineral oils
239b	Gasoline of all kinds
239b	Petroleum, crude; Mountain (earth) tar, natural, liquid
239d	Gas oil (except for light oil)
239e	Lubricating oils, mineral (lubricant, paraffin, vaseline, volcanic oil, etc.)
239e	Oil, cleaned (light oil)
239f	Naphtha
239f	Fuel oil and heating fuels
239g	Lignite tar, peat, shale oil and other mineral oils; tar-like, residue not sinking in water (heating fuels); Retinol; Mixtures, not falling under 239c and 260
239g	Petrol, gasoline, naphtha, and other petroleum ether, other light refined mineral oils
239h	Lignite tar, peat, shale oil and other mineral oils; tar-like, residue not sinking in water (heating fuels); Retinol; Mixtures, not falling under 239c and 260
240a	Asphalt, solid, asphalt stones
240b	Mastics, asphalt kit, resin, wood cement
241	Earth wax (ozokerite), raw, even unmelted, Montan wax bitumen
243a	Pitch (without coal pitch), pitch rate; Black wax
243b	Pitch-like residues of petroleum distillation that sink in water
243d	Oil and water gas tar
249	Ozokerite purified, ceresin, etc. In blocks; Wax stumps thereof
250b	Paraffin, raw (paraffin scales, butter, etc.) or cleaned (except soft parrafin)
251	Soft paraffin

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
280b	Carnallite with at least 9 and less than 12% K2O
280c	Crude salts with 12 to 17. 9 % K20
280d	Fertilizing salts with 18 to 42% K2O
280e	Abraum salts, so-called. Stassfurter, not mentioned elsewhere
281	Dornstein (Fertiliser Salt)
291	Schlempekohle
295a	Sulphate of potash (potassium sulphate)
295b	Phosphorus potash (potassium phosphate)
303	Nitrate of soda (Chile saltpetre, sodium nitrate)
317D	Phosphoric acid salts, otherwise not mentioned, e. G. Disodium phosphate, ammonium phosphate
317V1	Ammonia, sulfuric acid
317V3	Potassium chloride
317V4	Potassium magnesia, sulfuric acid
317V5	Calcium cyanamide
317V6	Calcium nitrate; Urea; above otherwise unmentioned chemical fertilizers
359a	Guano, artificial; meat and bone meal; animal manure ground
359b	Guano, natural
360	Bone meal
361	Thomas phosphate flour
362	Superphosphates etc
391a	Raw silk, undyed: from silkworm
391b	Raw silk, undyed: etc. From oak egger, tussah
392a	Raw silk, dyed (including dyed white): from silkworm
392b	Raw silk, dyed (including dyed white): from oak egger, tussah
393	Raw silk in combination with other cocoons, fan mussel silk
396	Foil silk (waste silk): uncombed
397	Foil silk (waste silk): combed
398a	Foil silk webs, undyed: easy
398b	Foil silk webs, undyed: multiple
398c	Foil silk webs, colored (also colored white)
398d	Bourette yarn
398e	Floss silk webs in conjunction with other textile materials or cocoons
399a	Silk yarn for retail sale. Raw silk or artificial silk
399b	Silk yarn for retail sale. Of Silk Foil
400	Raw silk, artificial silk and foil webs, in conjunction with metal filaments
401	Dese, unpatterned Fabric of silkworm silk, raw
402	Density fabric for furniture and room facilities (except velvet and plush): all of silk
403	Density fabric for furniture and room facilities (except velvet and plush): partly made of silk
404b	Velvet and plush, velvety and plushy fabric: entirely of silk: Other fabrics
404d	Velvet and plush, velvety and plushy fabric: partly made of silk. Other fabrics
405c	Dense fabrics, entirely of silk, other

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
405d	Other fabrics, crepe (unless 408a / f) entirely of artificial silk
405e	Other fabrics, crepe (unless 408a / f) in the warp or weft entirely of artificial silk
405f	Other fabrics, crepe (unless 408a / f), other
405g	Other fabrics, other than crepe, made entirely of artificial silk
405h	Other fabrics, other than crepe, in the warp or weft wholly of artificial silk
405i	Other fabrics, other than crepe, other
405l	Dense fabrics, partially made of silk, other
405m	Other fabrics, crepe (unless 408a / f) of artificial silk and other textile materials, but without natural silk
405n	Other fabrics, crepe (unless 408a / f), other
405o	Other fabrics, other than crepe, made of artificial silk and other textile materials, without natural silk
405p	Other fabrics, other than crepe, other
407	Bag silk cloth (bolting)
408a	Leaking fabrics, wholly or partly made of silk (gauze, crêpe and the like) with the exception of tulle, bolting cloth, lace fabrics and tips, entirely of silk: partially made of silk, in part from natural silk
408b	Leaking fabrics, wholly or partly made of silk (gauze, crêpe and the like) with the exception of tulle, bolting cloth, lace fabrics and tips, entirely of silk: other
408	Leaking fabrics, wholly or partly made of silk (gauze, crêpe and the like) with the exception of tulle, bolting cloth, lace fabrics and tips, entirely of silk
408a	Leaking fabrics, wholly or partly made of silk (gauze, crêpe, and the like) with the exception of tulle, bolting cloth, lace fabrics and tips, entirely of silk: all of artificial silk
408b	Leaking fabrics, wholly or partly made of silk (gauze, crêpe [unless 405d / f or 405 m / n], Flor and the like) with the exception of tulle, bolting cloth, lace fabrics and tips, entirely of silk: in the warp or weft entirely of artificial silk
408c	Leaking fabrics, wholly or partly made of silk (gauze, crêpe and the like) with the exception of tulle, bolting cloth, lace fabrics and tips, entirely of silk: the weights of more than 20g on 1 square meter [653-01]
408d	Leaking fabrics, wholly or partly made of silk (gauze, crêpe and the like) with the exception of tulle, bolting cloth, lace fabrics and tips, entirely of silk: the weights of 20g or less 1 qm
408e	Leaking fabrics, wholly or partly made of silk (gauze, crêpe and the like) with the exception of tulle, bolting cloth, lace fabrics and lace, partially silk: from artificial silk or other textile materials but without natural silk
408f	Leaking fabrics, wholly or partly made of silk (gauze, crêpe and the like) with the exception of tulle, bolting cloth, lace fabrics and lace, partially made of silk, other
413a	Sheep's wool (including tanner's wool) processed
413b	Hair from llamas or camels, processed
413c	Goat hair, processed
413d	Hare, rabbit, beaver, monkey, Muskrat, nutria processed
413e	Hair of cattle, deer, dogs, pigs and similar coarse animal hair, processed

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
413f	Wool noils
413g	Waste of bleached or dyed wool, wool flakes, shear wool, Flock wool, cloth debris, waste from other processed animal hair
414	Artificial wool
415	Curled hair, coarse animal hair
416a	Merino wool
416b	Cross breed wool
416c	Wool of camel hair and other animal hair
417	Yarn of coarse animal hair, single or two-wire
418a	Raw, solid mohair yarn, cashmere
418b	Raw, solid alpaca and camel hair yarn
418c	Raw, two- or more-stranded Mohair yarn, cashmere
418d	Raw, two- or more-stranded alpaca and camel hair yarn
418	Raw mohair yarn, cashmere
419	Genappe, mohair, alpaca, bleached, dyed, printed
420a	Hard worsted wool gloss over 20cm in length, unbleached: solid
420b	Hard worsted wool gloss over 20cm in length, unbleached: two-wire
420c	Hard worsted wool gloss over 20cm in length, unbleached: three-wired
420e	Hard worsted wool gloss over 20cm in length, unbleached: four or more-wired
421a	Hard worsted, bleached, dyed, printed: solid
421b	Hard worsted, bleached, dyed, printed: two-wired
421c	Hard worsted, bleached, dyed, printed: three-wired
421d	Hard worsted, bleached, dyed, printed: four or more-wired
422a	Worsted, raw, solid
422b	Worsted, raw, two-wired
422c	Worsted, raw, three-wired
422d	Worsted, raw, four or more-wired
423a	Worsted, bleached, dyed, printed: single-wired
423b	Worsted, bleached, dyed, printed: two-wire
423c	Worsted, bleached, dyed, printed: three-wired
423d	Worsted, bleached, dyed, printed: four or more-wired
424	Carded, crude yarn (by agreement, also one-wired colored Grisaille yarn)
425	Carded, bleached, dyed, printed yarn; also Grisaille yarn (yarn of synthetic wool), not in 424
426	Yarn of wool or other animal hair, put up for retail sale
429	Goods (or any combination) of cocoons of wool. Density fabric for furniture and room facilities (except velvet and plush), dyed, printed or yarns of different colors: in the piece by the meter
430	Goods (or any combination) of cocoons of wool. Density fabric for furniture and room facilities (except velvet and plush), dyed, printed or yarns of different colors: fully fashioned curtains, images, ceiling, etc
431	Goods (or any combination) of cocoons of wool. Velvet and plush, velvety and plushy fabric
432	Woolen fabrics (dress fabrics, etc.)

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
432a	Woolen fabrics (dress fabrics, etc.) in weights of: about 700g to 1 square meter; Press towels, belts, pulleys for pressing oil or fats
432b	Woolen fabrics (dress fabrics, etc.) in weights of: more than 500 to 700g per sqm
432c	Woolen fabrics (Fabrics for clothing, etc.) in the weights of: 200 to 500 g per sqm
432d	Woolen fabrics (Fabrics for clothing, etc.) in the weights of: up to 200g per sqm
433	Active (tricot) net fabrics
438a	Cotton, bleached, dyed, carded (deleted), combed
438b	Waste from processed cotton, synthetic cotton
440a	Cotton yarn: solid, rough, trimmed, steamed. To no. 11 English
440b	Cotton yarn: solid, rough, trimmed, steamed. About 11 to 17 English
440c	Cotton yarn: solid, rough, trimmed, steamed. About 17 to 22 English
440d	Cotton yarn: solid, rough, trimmed, steamed. About 22 to 32 English
440e	Cotton yarn: solid, rough, trimmed, steamed. About 32 to 47 English
440f	Cotton yarn: solid, rough, trimmed, steamed. About 47 to 63 English
440g	Cotton yarn: solid, rough, trimmed, steamed. About 63 to 83 English
440h	Cotton yarn: solid, rough, trimmed, steamed. About 83 to 102 english
440i	Cotton yarn: solid, rough, trimmed, steamed. About 102 English
441a	Cotton yarn: solid, bleached, dyed, printed. To no. 11 English
441b	Cotton yarn: solid, bleached, dyed, printed. About 11 to 17 English
441c	Cotton yarn: solid, bleached, dyed, printed. About 17 to 22 English
441d	Cotton yarn: solid, bleached, dyed, printed. About 22 to 32 English
441e	Cotton yarn: solid, bleached, dyed, printed. About 32 to 47 English
441f	Cotton yarn: solid, bleached, dyed, printed. About 47 to 63 English
441g	Cotton yarn: solid, bleached, dyed, printed. About 63 to 83 English
441h	Cotton yarn: solid, bleached, dyed, printed. About 83 to 102 english
441i	Cotton yarn: solid, bleached, dyed, printed. About 102 English
442a	Cotton yarn: two or more-wired, once twisted: raw, well trimmed, steamed. To no. 11 English
442b	Cotton yarn: two or more-wired, once twisted: raw, well trimmed, steamed. About 11 to 17 English
442c	Cotton yarn: two or more-wired, once twisted: raw, well trimmed, steamed. About 17 to 22 English
442d	Cotton yarn: two or more-wired, once twisted: raw, well trimmed, steamed. About 22 to 32 English
442e	Cotton yarn: two or more-wired, once twisted: raw, well trimmed, steamed. About 32 to 47 English
442f	Cotton yarn: two or more-wired, once twisted: raw, well trimmed, steamed. About 47 to 63 English
442g	Cotton yarn: two or more-wired, once twisted: raw, well trimmed, steamed. About 63 to 83 English
442h	Cotton yarn: two or more-wired, once twisted: raw, well trimmed, steamed. About 83 to 102 english

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
442i	Cotton yarn: two or more-wired, once twisted: raw, well trimmed, steamed. About 102 English
442k	Cotton yarn: two or more-wired, twisted once: bleached, dyed, printed. To no. 11 English
442l	Cotton yarn: two or more-wired, twisted once: bleached, dyed, printed. About 11 to 17 English
442m	Cotton yarn: two or more-wired, twisted once: bleached, dyed, printed. About 17 to 22 English
442n	Cotton yarn: two or more-wired, twisted once: bleached, dyed, printed. About 22 to 32 English
442o	Cotton yarn: two or more-wired, twisted once: bleached, dyed, printed. About 32 to 47 English
442p	Cotton yarn: two or more-wired, twisted once: bleached, dyed, printed. About 47 to 63 English
442q	Cotton yarn: two or more-wired, twisted once: bleached, dyed, printed. About 63 to 83 English
442r	Cotton yarn: two or more-wired, twisted once: bleached, dyed, printed. About 83 to 102 english
442s	Cotton yarn: two or more-wired, twisted once: bleached, dyed, printed. About 102 English
443	Cotton yarn: two or more-wired, repeatedly twisted
444	Cotton thread of all kinds put up for retail sale
445	Articles of Baumwollgespinnsten: density fabric for furniture, room services (except velvet and plush), dyed, printed, patterned, colored woven
446	Goods from Baumwollgespinnsten: velvet, plush, velvety, plushy fabric: not cut
447	Goods from Baumwollgespinnsten: velvet, plush, velvety, plushy fabric: cut
448	Goods from Baumwollgespinnsten: velvet, plush, velvety, plushy fabric: cut
450	Permeable fabrics for curtains: the piece by the meter (curtain materials)
451	Permeable fabrics for curtains: abgepasst
453a	Bands
453b	Chenille
454	Other fabrics, wholly of cotton, unbleached
455a	Other fabrics, trimmed, bleached
455b	Other fabrics dyed
455c	Other Fabrics printed
456	Yarn of different colors other fabrics
457a	Other fabrics, partly of cotton, unbleached
457b	Other fabrics, trimmed, bleached
457c	Other woven fabrics, colored, printed od yarns of different colors
453-457	Other fabrics made of cotton (merged)
453b	Fabric, not falling under 445-452, crude: at weights of 80 g or more square meters to 1: satin stitch fabric
453c	Fabric, not falling under 445-452, crude: at weights of 80 g or more square meters to 1: other Fabrics
454a	Fabric, not falling under 445-452, crude: from 40 to below 80g per square meter in weight: satin stitch fabric
454b	Fabric, not falling under 445-452, crude: from 40 to below 80g per square meter in weight: other fabrics
455a	Fabric, not falling under 445-452, crude: below 40g per sqm in weight: satin stitch fabric
455b	Fabric, not falling under 445-452, crude: below 40g per sqm in weight: other Fabrics
456a	Fabric, not falling under 445-452, processed: satin stitch fabric

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
456b	Fabric, not falling under 445-452, processed: other Fabrics
457a	Fabric, not falling under 445-452, dyed, printed or yarns of different colors: satin stitch fabric
457b1	Fabric, not falling under 445-452, others, dyed: weights of 80g or above to 1 sq. M
457b2	Fabric, not falling under 445-452, others, dyed: weights of less than 80g per 1 sq. M
457c1	Fabric, not falling under 445-452, others, printed: weights of 80g or above per 1sqm
457c2	Fabric, not falling under 445-452, others, printed: weights of less than 80g per 1sqm
457d1	Fabric, not falling under 445-452, other yarn of different colors: weights of 80g per square meter or above
457d2	Fabric, not falling under 445-452, other yarn of different colors: weights of less than 80g per 1sqm
458	Active (tricot) and net fabrics (cotton)
472a	Linen: flax yarn, solid, raw, to No. 8 English
472b	Linen: flax yarn, solid, raw, english about 8 to 14
472c	Linen: flax yarn, solid, crude, about 14 to 20 English
472d	Linen: flax yarn, solid, raw, English over 20 to 35
472e	Linen: flax yarn, solid, raw, English over 35 to 75
472f	Linen: flax yarn, solid, raw, English 75
472g	Linen: Flax tow yarn, solid, raw, to No. 8 English
472h	Linen: Flax tow yarn, solid, raw, english about 8 to 14
472i	Linen: Flax tow yarn, solid, crude, about 14 to 20 English
472k	Linen: Flax tow yarn, solid, raw, English over 20 to 35
472l	Linen: Flax tow yarn, solid, raw, English over 35 to 75
472m	Linen: Flax tow yarn, solid, raw, English 75
473	Linen: solid, bleached, dyed, printed
473a	Linen: solid, bleached, dyed, printed until no. 20
473b	Linen: solid, bleached, dyed, printed, English about 20 to 35
473c	Linen: solid, bleached, dyed, printed, English 35
474	Linen: two- or multi-wired (twisted), unbleached, bleached, dyed, printed
475a	Hemp yarn, solid, raw
475b	Hemp tow yarn, solid, raw
475c	Yarn from Manila-, New Zealand hemp, Agave- and coconut fibers, etc. , solid, raw
476	Hemp yarn, Hemp tow yarn, yarn from Manila-, etc hemp and fibers, solid, bleached, dyed, printed
477a	Hemp yarn, hemp tow yarn, yarn from Manila-, etc hemp fibers and, two- or multi-core (twisted), unbleached, bleached, dyed, printed
477b	Coconut yarn (fibers), two- or multi-wired
478	Ramie yarn, also mixed with flax or jute, solid, raw
479	Ramie yarn, also mixed with flax or jute, solid, bleached, dyed, printed
480	Ramie yarn, also mixed with flax or jute, two- or multi-core (twisted), unbleached, bleached, dyed, printed
481a	Jute yarn, solid, raw, to No. 8 English
481b	Jute yarn, solid, raw, on no English; stranded, raw

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
482	Jute yarn, bleached, dyed, printed
483a	Yarn of vegetable textile fibers other than cotton, for retail sale: from flax
483b	Yarn of vegetable textile fibers other than cotton, for retail sale: from hemp or other textile materials
490	Density jute fabric for furniture, dyed, printed, yarns of different colors, patterned room facilities (except velvet and plush)
491	Fabric, velvet, plush, velvety, plushy fabric
492	Dense Fabric, unpatterned, from flax, ramie: raw
493	Dense fabrics, unpatterned, from flax, ramie: bleached, dyed, printed, but woven
494	Dense fabrics, unpatterned, hemp, Hanfwerg, Manila hemp, agave fiber, etc: raw
495	Dense fabric, unpatterned, hemp, hemp tow, Manila hemp, agave fiber, etc: bleached, dyed, printed
496b	Dense fabric, unpatterned, pack screen and other raw jute
497	Dense fabric, unpatterned, jute, bleached, dyed, printed, colored woven
498a	Dense fabric patterned, of textile materials (subsection D), damask
498b	Dense fabric, patterned of textile materials (subsection D), other
498	Dense fabric, patterned of textile materials (subsection D), other
499	Gauze, tulle and similar leaky fabric of textile materials (the lower portion D)
500a	Active (tricot) fabrics and net products (textile of the lower portion D)
515a	Processed horsehair, hackled, drawn, bleached
515b	Curled hair from horse hair
543d	Waste of spun goods of all kinds
543a	Silk, woolen rags; Cloth strips
543b	Cotton-, linen rags, etc. , and other waste of web products and the like is not used as fertilizer
543c	Cotton-, linen rags, etc. , and other waste of web products and the like, used as fertilizer (e. G. Wool dust fertilizer, manure waste silk)
574a	Tubes, of rubber for tires: vehicle wheel
574b	Tubes, of rubber for tires from other vehicle wheels
574c	Hoses, other, of rubber
575	Transmission belts from woven goods with rubber
576	Tarpaulin, processed, of coarse spun yarn products, with rubber
578a	Rubber tires for vehicle wheels
578b	Automobile tire protectors
578c	Bike tire protectors
579a	Other wares made of soft rubber; Floor covers thereof; Rubber sheets with web goods; iron rolls
579b	Piston, gland packings, sealing strings
581	Rubber printing blankets for factories, scratching cloths for scratching factories
586	Other hard rubber goods
777a	Pig-iron

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
777b	Ferrosilicon with a silicon content of 25vH or less; Ferromanganese with a manganese content of 50vH or less; Ferrochrome, -tungsten, -titanium, -molybdenum, vanadium with a content of alloying metal of less than 20 percent; Ferro aluminum, nickel and other non-malleable iron alloys predominantly containing iron
778	Tubes and tube fittings of non-malleable cast metal, more than 7mm wall thickness
778a	Tubes and tube fittings of malleable cast metal, more than 7mm wall thickness: raw
778b	Tubes and tube fittings of non-malleable cast metal, more than 7mm wall thickness: processed
779	Tubes and tube fittings of non-malleable cast metal, up to 7 mm wall thickness
779a	Tubes and tube fittings of non-malleable cast metal, up to 7mm wall thickness: raw
779b	Tubes and tube fittings of non-malleable cast metal, up to 7 mm wall thickness: Produced
780A	Rolls of non-malleable cast metal
780A1	Rolls of non-malleable cast metal: raw
780A2	Rolls of non-malleable cast metal: processed
780B	Economizer and parts thereof from malleable cast iron
782a	Machine parts made of iron and steel, raw
783a	Machine parts made of iron and steel: locomotives, road steam rolls Lokomotiv tenders, steam engines, turbines and other power (engine) machines (except electric motors)
783b	Machine parts made of iron and steel, machined, from agricultural and dairy equipment
783c	Machine parts made of iron and steel, processed. Of electrical machines Nos 907 a / g, parts of other electrotechnical products of the numbers 907h to 911b
783d	Machine parts made of iron and steel, processed: by not mentioned above machines
784	Puddled bars; raw tracks; ingots; slabs; pre-rolled blocks; boards; Stick; Steel crucible in blocks
785A1	Malleable iron rods: support beams with a height of 80mm and above
785A2	Malleable iron rods: other form of iron; not shaped iron bar; Iron rods, not more than 12 cm long, for remelting
785B	Hot-rolled strip steel or forged; malleable iron rods cold rolled or drawn; also strip steel with rolled-in patterns
786a	Sheet metal: raw, descaled, varnished: 5mm and more strong (heavy plates)
786b	Sheet metal: raw, descaled, varnished: from 1 mm to less than 5 mm thick
786c	Sheet metal: raw, descaled, varnished: up to 1mm thick
787	Sheet metal, abraded, coated with enamel, painted, polished, or otherwise artificially oxidized
788a	Sheet metal, tinned
788b	Sheet metal, zincked
788c	Sheet metal, leaded or with other base metals or alloys of base metals
789	Sheet metal, corrugated, stretched, chequered, goffered, pinned
790	Sheet metal (except 789), pressed, hunched, flanged, welded, bent, punched, drilled
791	Wire, hot-rolled or forged
791a	Wire, hot-rolled or forged: raw
791b	Wire, hot-rolled or forged: processed
792a	Wire, cold rolled or drawn: not further processed; Wire strings for clay tools not overspun
792b	Wire, cold rolled or drawn: further processed

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
793	Serpentine tubes, rolled or drawn; Tube fittings
793a	Serpentine tubes, rolled or drawn; Tube fittings: raw
793b	Serpentine tubes, rolled or drawn; Tube fittings: processed
794	Other tubes, rolled or drawn: raw
794a	Other tubes, rolled or drawn: raw, with a wall thickness of 2mm
794b	Other tubes, rolled or drawn: raw, with a wall thickness of less than 2mm
795a	Other tubes, rolled or drawn: processed with a wall thickness of 2mm
795b	Other tubes, rolled or drawn: processed with a wall thickness less than 2 mm
796	Railway and other tracks
798a	Parts of machines (malleable cast iron), ships, vehicles, etc. , raw: of more than 10dz
798b	Parts of machines (malleable cast iron), ships, vehicles, etc. , raw: of more than 1 to 10dz
798c	Parts of machines (malleable cast iron), ships, vehicles, etc. , raw: of more than 3kg to 1dz
798d	Parts of machines (malleable cast iron), ships, vehicles, etc. , unbleached: up to 3kg
799a	Processed machine parts (malleable cast) of locomotives, road rollers, locomotive tenders, steam engines, and other force (drive) engine turbines (except electric motors)
799b	Processed machine parts (malleable cast iron) of agricultural and dairy machinery
799c	Processed machine parts (malleable cast iron):. Of electrical machines Nos 907 a / g, parts of other electrotechnical products Nos 907h to 911b
799d	Procssed machine parts (malleable cast iron) from other machines
799e	Processed machine parts (malleable cast iron): blade coating for rotary printing machines, processed
801a	Boilers, etc. : locomotive boilers
801b	Boilers, etc. : other steam boilers of malleable iron with more than 10 equal tubes of 300mm or less internal diameter
801c	Boilers, etc. : steam boilers of all kinds of non-malleable cast iron and steam drums of malleable iron with about 10 equal tubes of 300mm or less clear width
801d	Items (replacement and spare parts) of all kinds of non-malleable cast iron
802	Boilers, etc. : Other vapor generating boilers and steam drums of malleable iron
803	Anchor tonnes (buoys), gas, and other containers, vessels, appliances, boilers (except for steam boilers) of malleable iron, for factories, breweries, distilleries, riveted, pressed, welded and composite parts
804	Tube fittings; Taps and valves and similar equipment pieces of malleable iron for steam boilers, steam drums, containers and similar devices for pipe services: without other base metals
805	Tube fittings; Taps and valves and similar pieces of equipment of malleable iron for steam boilers, steam drums, containers and similar devices for tube performance: with other base metals
816a	Plows, iron (for motor operation s. 893B1 / 2 and 905a)
816b	Agricultural equipment, otherwise not mentioned, for example, Cultivators, plows, potato spinner, harrows, rakes (for motor operation s. 893B1 / 2 and 905a)
816c	Scales, s. Also 891E1 and E5
817	Card clothing
818	Spindles of all kinds of iron

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
819	Spinning rings, Heald, weaver braids, braid rings, sheets, coils, and similar equipment for spinning, twisting, weaving
869A1	Copper, crude
869A3	Brass, raw or as a fraction, waste
869A4	Bronze and other copper alloys, raw or as a fraction, waste
869B1	Ferromanganese with a manganese content of more than 50%
869B2	Ferrochrome, -tungsten, -titanium, -molybdenum, vanadium with a content of alloys of 20% or above
870a	Rods, plates, trays and other shaped pieces, forged or rolled copper
870b	Rods, plates, trays and other shaped pieces, forged or rolled, brass, tombac, bronze, chromium or other metals Nos. 869A4 / 869B2
871a	Wire: copper, iron wire with copper wire wound etc
871b	Wire, other metals Nos. 869A3 / 869B2, iron wire to this wire wound etc
872	Cemented wire
874a	Rolls of copper or copper alloys, etc. , for finishing of spun yarn products or for printing, incl. Connected thereto machinery and machine parts
874b	Printing plates made of copper or copper alloys
877c	Rough tubes, made of copper
877d	Rough tubes, made of brass
890a	Wire of base metal, plated, wrapped, braided, braided: for electrical engineering
891E1	Bells, operated by air pressure; electrical machines; Models of machines and ships of base metal; Counting machines, independent measuring and recording devices (not including the aforementioned), hydrometric instruments, speed meters of vehicles, all of these without clocks, non-electric; automatic weighing instruments and vending machines
891A1	Typewriters, also in fixed connection with electric machines, also with means for computing
891A2	Calculators
891B	Calculating machines (also writing), also in fixed connection with electric machines
891C	Parts of typewriters and calculators (other than arithmetic units)
891D1	Talking machines (phonographs, gramophones, etc.)
891D3	Control cashier machines
893A1	Steam locomotives, not running on rails; Steam Road-roller
893A2	Steam engines: up to 60 dz the piece
893A3	Steam engines: 60 dz the piece
893A4	Items for machinery Nos. 892a to 893B2 separately sold
893B1	Vehicles other than steam locomotives, not running on rails; plows, tillage equipment with built-in engine: to 25 dz the piece
893B2	Vehicles other than steam locomotives, not running on rails; plows, tillage equipment with built-combustion engines: over 25 dz the piece
894E1	Fixed combustion, internal combustion engines; Blast furnace gas engines: diesel engines
894E2	Fixed combustion, internal combustion engines; Blast furnace gas engines: other in a clean engine weight of 750 or less quintals

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
894E3	Fixed combustion, internal combustion engines; Blast furnace gas engines: other, wherein a net weight of the engine exceeding 750 quintals
894a	Steam engines
894b	Steam, gas turbines
894c	Hydraulic power engines
894d	Combustion, combustion engines for use in vehicles of all kinds
894d1	Combustion, explosion engines for aircraft
894d2	Combustion, Explosion engines for land vehicles (motor locomotives, tractors, passenger, delivery. , Load motor cars, motor bikes)
894d3	Combustion, combustion engines for marine propulsion: diesel engines
894d4	Combustion, combustion engines for marine propulsion: other engines
894d5	Combustion, combustion engines for use in vehicles of all kinds
894e	Fixed combustion, internal combustion engines; Blast furnace gas engines
894f	Hot air and compressed air motors, and other not mentioned above force (drive) and machinery (electric except electric motors, vehicles with prime movers, e. G. , gasoline, alcohol engines, crawlers, petroleum road rollers use); Wind engines, Goepel works
894g	Fixed, mobile or floating cranes
894h	Steam engines, in conjunction with dynamos, pumps, hammers, fans, cold, lifting, conveying machines
894i	Steam, gas turbines, in conjunction with s. 894h
894k	Combustion engines, blast furnace gas engines, in conjunction with s. 894h
894l	Other power (drive) equipment (except electric motors), in conjunction with s. 894h
894m	Force, drive machines (except electric motors) with non fortschaffbaren winches, reels
894n	Excavators, pile drivers
895a	Sewing machines for manual operation, without frame heads of sewing machines, parts thereof (excluding needles)
895b	Knitting machines for manual operation, without frameworks, heads, parts thereof (excluding needles)
896a	Sewing machines with racks or for motorized operation (s spare parts. 895a)
896b	Knitting machines with racks or for motor operation (s spare parts. 895b)
897	Racks of sewing, knitting, net knitting machines, parts thereof (including table tops and tables to)
898	Machinery, parts with scratching fittings
899a	Machines for preparing the processing and spinning of silk
899b	Machines for preparing the processing and spinning of wool (worsted)
899c	Machines for preparing the processing and spinning of wool
899d	Machines for preparing the processing of cotton
899e	Cotton spinning machines
899f	Machines for preparing the processing and spinning of flax, hemp, tow, jute, ramie and textile materials not mentioned above
899g	Machine for twisting, coiling, coil, winding the yarns and threads
899h	Machines for preparing the webs for weaving

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
900	Looms
901a	Curtain, lace, tulle
901b	Knitting machines
901c	Embroidery machines (except crank embroidery machines)
902a	Finishing machines
902b	Machines for laundry and dry cleaning
903	Fire engines; Pumps for human or animal operation to pump liquids
904a	Metalworking machines (s. Also 906B)
904b	Woodworking machines (s. Also 906B)
904c	Stone processing machines (s. Also 906B)
904d	Steam, hydraulic forging presses; riveters; mechanical hammers (freehand guided air pressure hammers 906B), also in fixed connection with electric motors
905a	Plows and other tillage equipment for motor operation or built-in combustion engines (engines with no. 893B 1/2)
905b	Mowers (s. Also 906D2)
905c	Items to machinery Nos. 905a / b and 906C / D3 alone basis
906A	Rock drilling machines
906B	Pneumatic tools with the exception of the non-hands-free operations (904a / d)
906C	Milk separation machines
906D1	Threshing machines
906D10	Pumps, water holding machines (other than at 894h / 1 and 903) in conjunction with electric motors
906D11	Chillers (other than under 894 h / l), in connection with electric motors (ice cream making machines according to the nature of the substance)
906D12	Lifting equipment (elevators, elevators, lifts, elevators, elevator, hoisting machines), also in fixed connection with electric motors
906D13	Machines for bookbinding, carton, stationery production
906D14	Machines for sorting, washing, crushing and shapes from coal, ores, rocks
906D15	Blowers, exhausters, ventilation equipment, ventilators, also in fixed connection with electric motors (in other connections 894 h / l), but with the exception of electric fans in which the ventilation wheel sits directly on the shaft of the electric motor (907 b / g)
906D16	Machines for leather, footwear industry
906D17	Machines for lime, loam, clay, cement and related industries
906D18	Quick presses for book, stone, light, metal decorating, etc
906D19	Other printing machines
906D2	Seeders, tedders, hay, straw, etc. Presses, fodder cutting, chopping, butter machines, lawn mowers, other unnamed agricultural machinery
906D20	Other equipment not specifically mentioned (machines for polishing mirrors, baking, material control, etc.)
906D3	Cleaning machines for cereals, pulses, rice, oilseeds
906D4	Brewery, distillery, Malt machines, machines of the sugar industry

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
906D8	Flour Mill (cleaning machines s. 906D3)
906D9	Machines for wood pulp, paper-making
907a	Alternators and Lichtzündmaschinen for motor vehicles; Occasion motors for internal combustion engines
907b	Dynamos, electric motors, converters; Transformers and reactors: up to 10kg
907c	Dynamos, electric motors, converters; Transformers and reactors: about 10 to 25kg
907d	Dynamos, electric motors, converters; Transformers and reactors: about 25kg to 1,5dz
907e	Dynamos, electric motors, converters; Transformers and reactors: over 1,5dz to 5dz
907f	Dynamos, electric motors, converters; Transformers and reactors: about 5 to 30dz
907g	Dynamos, electric motors, converters; Transformers and reactors: over 30dz
907h	Ready-made anchors, collectors
908a	Electricity collector whose replacement plates (electrodes) without cell horn-like shape material or hard rubber
908b	Electricity collector whose replacement plates (electrodes): with cell horn, similar Formerstoffen or hard rubber
909	Cable suitable for the transmission of electric currents, for laying in water or soil
910a	Electric arc lamps, mercury vapor, quartz undihnen similar lamps
910b	Full Housing for arc lamps, mercury vapor, quartz and them similar lamps with glass bell, whether or not gimped
910c	Headlights, light-scattering reflectors
911a	Metal filament lamps
911b	Coal wire and other electric light bulbs
912A1	Telegraph plants, electric; components thereof
912A2	Telephone, wall and table stations, telephone switching equipment, electric; components thereof
912A3	Devices for wireless telegraphy and telephony; components thereof
912A4	Electrical measuring, counting, and recording devices also in connection with movements, components thereof
912B	Electric irons; components thereof
912C	Electrical heating, cooking and other heating appliances; components thereof
912D	X-ray tubes; components thereof
912E	Magnet ignition machines and other electric ignition systems, and parts thereof (except the magnet); Electrical accessories for motor vehicles
912F1	Electrical safety and signaling apparatus; electric bells; components thereof
912F2	Electrical devices for lighting, power transmission, electrolysis; resistors; Other previously not mentioned electrical devices; components thereof
912F3	Electrical devices for medical and dental purposes; Components thereof (other than X-ray tubes)
912F4	Galvanic (also dry) elements, electrical and electrical batteries, thermocouples; components thereof
912F5	Insulation rolls, bells, buttons, reels, buttons, switches, etc. For earthenware, porcelain or glass (except porcelain insulators for telegraph or telephone lines)
912F6	Insulation articles made of asbestos, Cardboard asbestos, mica, for electrical engineering (protection box, etc.)

Table B.6: List of All Goods in the Sample of German Imports

Tariff No	Name
915a	Personal motor cars; Undercarriages incorporating a motor for passenger cars; Tops
915b	Goods (load) motor car, like. Trolley for special purposes, road rollers (except steam road rollers), etc. ; Stands with built-in motor for these vehicles
915c	Motorcycles
915d	Aircraft, steered
915e	Parts of chassis for motor vehicles
915f	Aircraft steerable; parts

Table B.3: Imports disaggregated by geography

Continent	Category	Share 1929	% Change 1929-31	% Change 1931-33
Africa	Agriculture	0.56	-59.35	-42.15
Africa	Colonial	0.01	-88.88	-80.73
Africa	Manufactures	0.00	452.17	-59.06
Africa	Raw materials	0.43	-43.60	31.14
Africa	Total	1.00	-52.79	-4.45
America	Agriculture	0.34	-76.07	-36.07
America	Colonial	0.09	-49.53	-31.84
America	Manufactures	0.06	-67.62	-68.72
America	Raw materials	0.51	-61.16	-23.09
America	Total	1.00	-65.51	-29.91
Asia	Agriculture	0.11	-29.00	-61.58
Asia	Colonial	0.41	-50.82	-51.57
Asia	Manufactures	0.02	-44.13	-48.18
Asia	Raw materials	0.46	-52.97	-21.96
Asia	Total	1.00	-49.20	-40.49
Europe	Agriculture	0.32	-48.33	-56.32
Europe	Colonial	0.04	-28.11	-23.54
Europe	Manufactures	0.30	-46.03	-49.18
Europe	Raw materials	0.30	-43.61	-36.66
Europe	Total	1.00	-45.09	-46.45
Oceania	Agriculture	0.76	-62.38	-9.91
Oceania	Colonial	0.00	-94.31	-24.24
Oceania	Manufactures	0.00	-40.00	64.10
Oceania	Raw materials	0.23	-51.99	16.17
Oceania	Total	1.00	-60.01	-2.60
Total	Agriculture	0.32	-59.84	-47.22
Total	Colonial	0.11	-46.88	-39.98
Total	Manufactures	0.15	-49.22	-51.02
Total	Raw materials	0.40	-53.61	-25.10
Total	Total	1.00	-54.02	-38.17

Note: Author's calculations based on Statistisches Reichsamt (1930-1934), *Monatliche Nachweise*.

Table B.4: Exports disaggregated by geography

Continent	Category	Share 1929	% Change 1929-31	% Change 1931-33
Africa	Agriculture	0.02	-93.79	348.28
Africa	Colonial	0.00		
Africa	Manufactures	0.90	-40.39	-45.14
Africa	Raw materials	0.08	52.26	-55.06
Africa	Total	1.00	-34.06	-46.29
America	Agriculture	0.03	-80.35	-68.45
America	Colonial	0.04	-74.18	-68.06
America	Manufactures	0.84	-60.87	-49.28
America	Raw materials	0.09	-52.64	-47.21
America	Total	1.00	-61.16	-49.77
Asia	Agriculture	0.01	-69.20	-63.95
Asia	Colonial	0.00		
Asia	Manufactures	0.96	-46.63	-52.57
Asia	Raw materials	0.03	-60.82	6.33
Asia	Total	1.00	-47.31	-51.31
Europe	Agriculture	0.06	-57.26	-44.92
Europe	Colonial	0.02	-65.16	-81.91
Europe	Manufactures	0.63	-13.13	-51.72
Europe	Raw materials	0.29	-30.47	-44.04
Europe	Total	1.00	-21.99	-49.77
Oceania	Agriculture	0.00		
Oceania	Colonial	0.00		
Oceania	Manufactures	0.95	-65.26	-39.03
Oceania	Raw materials	0.04	-17.04	-16.67
Oceania	Total	1.00	-63.73	-36.61
Total	Agriculture	0.05	-59.13	-45.57
Total	Colonial	0.02	-67.60	-78.92
Total	Manufactures	0.68	-25.18	-51.44
Total	Raw materials	0.24	-31.46	-43.96
Total	Total	1.00	-29.37	-49.78

Source: Author's calculations based on Statistisches Reichsamt (1930-1934), *Monatliche Nachweise*.

Table B.5: Unit value changes in imports and exports by continent

		Imports		Exports	
Continent	Category	% Change 1929-31	% Change 1931-33	% Change 1929-31	% Change 1931-33
Africa	Agriculture	-0.42	-0.48	-0.57	-0.30
Africa	Manufactures			-0.11	-0.22
Africa	Raw materials	-0.75	-0.33	-0.05	-0.37
Africa	Total	-0.59	-0.41	-0.11	-0.30
America	Agriculture	-0.64	-0.32	-0.47	-0.40
America	Colonial	-0.30	-0.43	-0.46	-0.75
America	Manufactures	0.10	-0.03	-0.09	-0.20
America	Raw materials	-0.55	-0.44	-0.38	-0.21
America	Total	-0.42	-0.37	-0.43	-0.37
Asia	Agriculture	-0.53	-0.42	-0.93	-1.31
Asia	Colonial	-0.52	-0.44		
Asia	Manufactures	-0.24	-0.69	-0.14	-0.24
Asia	Raw materials	-0.58	-0.45	-0.11	-0.32
Asia	Total	-0.53	-0.44	-0.14	-0.32
Europe	Agriculture	-0.37	-0.35	-0.51	-0.27
Europe	Colonial	-0.06	-0.49	-0.42	-0.44
Europe	Manufactures	-0.17	-0.26	-0.13	-0.17
Europe	Raw materials	-0.58	-0.39	-0.52	-0.27
Europe	Total	-0.24	-0.35	-0.42	-0.27
Oceania	Agriculture	-0.73	-0.37		
Oceania	Manufactures			-0.16	-0.31
Oceania	Raw materials	-0.71	-0.36	-0.05	-0.67
Oceania	Total	-0.72	-0.37	-0.16	-0.31
Total	Agriculture	-0.53	-0.37	-0.54	-0.35
Total	Colonial	-0.30	-0.44	-0.44	-0.59
Total	Manufactures	-0.17	-0.26	-0.13	-0.22
Total	Raw materials	-0.58	-0.39	-0.11	-0.32
Total	Total	-0.52	-0.39	-0.38	-0.31

C

Appendix to Chapter 5

C.1 Deriving the complete-use input-output matrix

If I allow for several steps of production and use of intermediate goods, I can decompose gross output y_j for an industry j, following Chen et al.'s notation,[1] into aggregate final usage in that industry, f_j, and aggregate intermediate usage of industry i, $m_i j$:

$$y_j = f_j + \sum_j m_{ij} \qquad i, j = 1, ..., 40, \tag{C.1}$$

Written in matrix form for all 40 industries, this results in the market clearing conditions:

1. Chen et al., "Revisiting the Effective Rate of Protection in the Late Stages of Chinese Industrialisation," 429.

$$y = f + Ay \tag{C.2}$$

or written in long form

$$\begin{pmatrix} y_1 \\ y_2 \\ \vdots \\ y_{40} \end{pmatrix} = \begin{pmatrix} f_1 \\ f_2 \\ \vdots \\ f_{40} \end{pmatrix} + \begin{pmatrix} a_{1,1} & a_{1,2} & \dots & a_{1,40} \\ a_{2,1} & a_{2,2} & \dots & a_{2,40} \\ \vdots & \vdots & \ddots & \vdots \\ a_{40,1} & a_{40,2} & \dots & a_{40,40} \end{pmatrix} \begin{pmatrix} y_1 \\ y_2 \\ \vdots \\ y_{40} \end{pmatrix} \tag{C.3}$$

where Ay is equal to the vector of intermediate inputs:

$$Ay = M = \begin{pmatrix} \sum_i M_{1,i} \\ \sum_i M_{2,i} \\ \vdots \\ \sum_i M_{40,i} \end{pmatrix} \tag{C.4}$$

I can then solve for y to get

$$y = (I - A)^{-1} f \tag{C.5}$$

which gives me a new matrix that accurately reflects infinite intermediate production steps,[2] since

$$(I - A)^{-1} = I + A^1 + A^2 + \ldots + A^\infty \tag{C.6}$$

I then use this to calculate the matrix of complete-use input-output coefficients.

$$B = (I - A)^{-1} - I \tag{C.7}$$

2. This can easily be shown to be true by multiplying both sides by $(I - A)$. I then get $I = I - A^1 + A^1 - A^2 + A^2 + \ldots - A^\infty + A^\infty$.

D

Appendix to Chapter 6

D.1 Membership in international cartels

Table D.1 shows Germany's membership in international cartels between 1925 and 1939. If trade in a given good were subject to a cartel agreement, the import volume may be artificially held at a lower level than we would expect in an equilibrium under perfect competition. The information in this table is based on data collected by Suslow[1] and the Federal Trade Commission.[2]

D.2 SITC Categories in the Sample

Table D.2 provides an overview of the categories of goods included in the sample, categorised by their SITC 3-digit numbers.

1. Suslow, "Cartel contract duration: empirical evidence from inter-war international cartels."

2. Federal Trade Commission, *The International Petroleum Cartel*.

D.3 Most important countries and goods in the sample

Table D.3 gives an overview of the most important categories of goods in my sample for five years: 1925, 1928, 1931, 1934, and 1937. The most important import categories remained relatively constant over the whole period. Relatively homogenous goods dominate this list, partially because imports in manufactures are more disaggregated in the German tariff code. The category with the highest import value for each of the five years depicted was raw cotton. Wheat was initially the second-biggest import, but dropped out of the top 10 during the Great Depression (though it returned to fourth place by 1937). Colonial goods such as tobacco and coffee constitute important categories in spite of high tariffs. Copper, coal, and rubber are the only non-agricultural products that appears in the lists. All categories go through a drastic reduction in trade value between 1928 and 1934.

To account for the diversity in homogeneity across traded goods, table D.4 shows the ten SITC categories in my sample that account for the highest trade values across the same five sample years. This aggregates the more granular manufactured goods categories into broader categories, but the results show that homogenous agricultural goods nonetheless dominate the import statistics. Cotton (SITC category 263) is the category with the highest or second-highest value in the whole period.

Table D.5 shows the most important import source countries in the sample. Despite the stark geographical reorientation of German trade, the United States and the United Kingdom remained among the most important import sources throughout the period. Romania is the only Southeastern European country in the top 10 in 1937. Germany's shift from the United States to Latin America becomes evident from the rise of Argentina and Brazil, the biggest and third-biggest import source in 1937, respectively. France rises

to fifth place after the signing of the 1927 trade treaty and remains in the top 10 through the Great Depression, but drops out by 1937.

D.4 Disaggregated tariff rates

Figures D.1, D.2, and D.3 show the average ad valorem equivalent tariff rates for imports disaggregated into the 19 main categories of the German tariff code, calculated based on the data on total tariff revenues by broad category from the appendices to *Monatliche Nachweise über den auswärtigen Handel* as well as volumes of *Wirtschaft und Statistik* for the years 1925 to 1935,[3] divided by the total value of imports in these categories as published in the *Monatliche Nachweise*. This more detailed disaggregation shows that agricultural ad valorem tariffs gradually increased starting in 1929 from 9.5 % to 28.4 % in 1934. Tariffs on minerals and fossil fuels rose by far more to 64.7 %. Tariffs on chemicals, stonewares, and precious metals remained flat throughout the period. Tariffs on machinery, electronics, and vehicles, pottery, glass and glasswares, and wood products only began to rise under the Nazis, while tariffs in the various manufactures category fell to slightly over 5 % and remained flat at that level.

D.5 Alternative Elasticity Specifications

Graphs D.4 to D.7 show the mean estimates for alternative specifications of the elasticities for each year. Figure D.4 shows how the functional form of the σ_h regressions changes the results. Figure D.5 shows results with different values for γ, all else equal. Figure D.6 does the same for different values for κ and D.7 for different values for τ, the supply elasticity.

3. Statistisches Reichsamt, *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember*; Statistisches Reichsamt, *Statistik des Deutschen Reichs 405: Berufszählung Süddeutschland und Hessen* (1928); Statistisches Reichsamt, *Statistik des Deutschen Reichs 412: Landwirtschaftliche Betriebszählung* (1929); Statistisches Reichsamt, ed., *Wirtschaft und Statistik*, 12 1935,

Figure D.1: Ad valorem equivalent tariff rates part 1

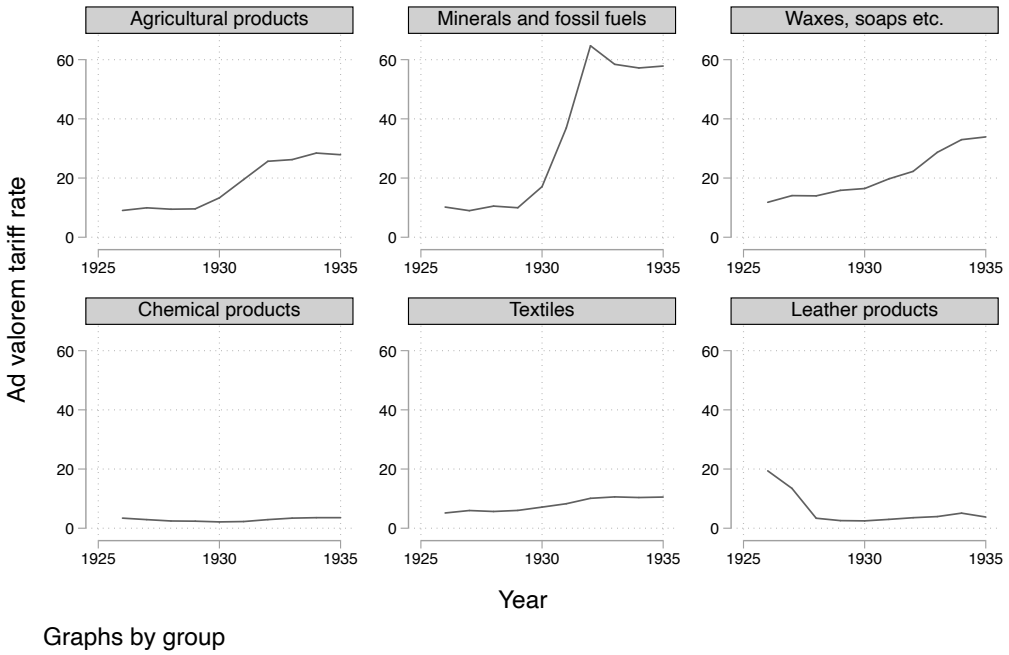


Figure D.2: Ad valorem equivalent tariff rates part 2

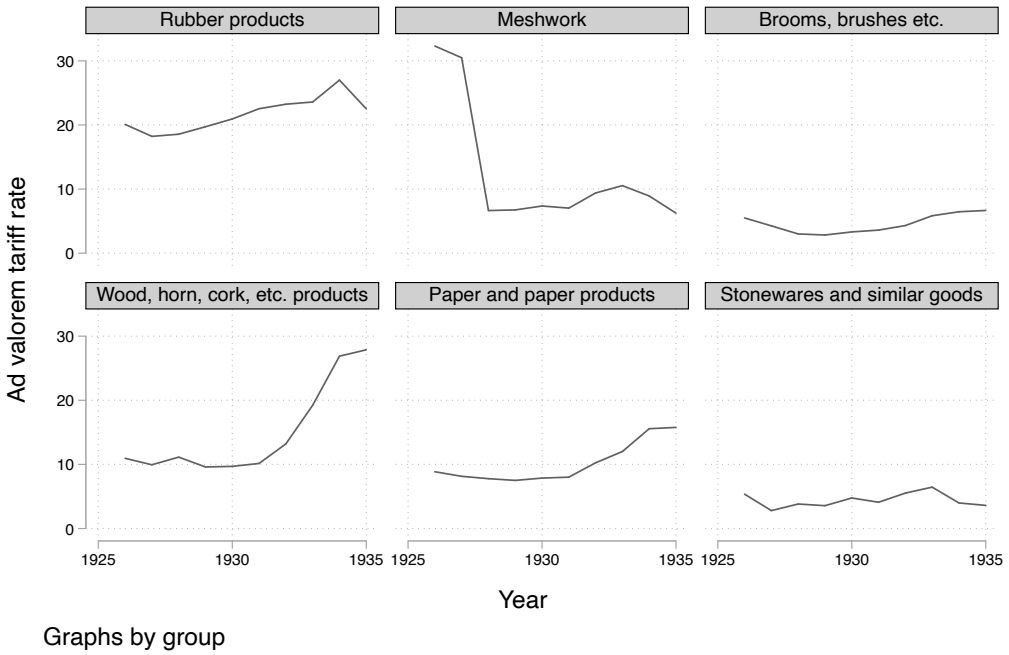
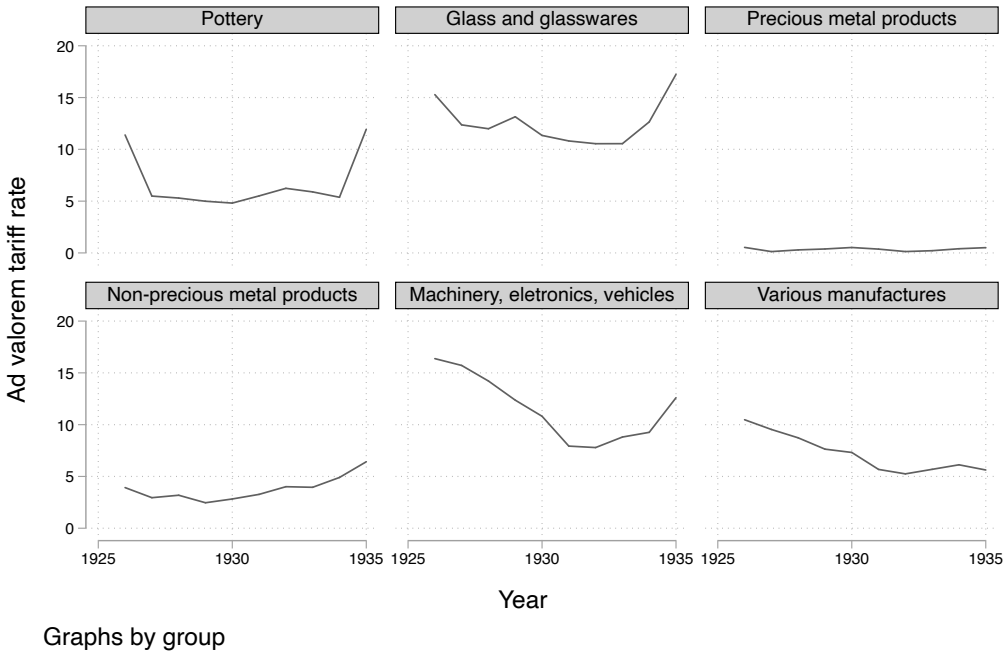


Table D.6 shows results for different specifications of the regression of κ. Column (1) and (2) use total imports in the sample as the explained variable

Figure D.3: Ad valorem equivalent tariff rates part 3



and the unweighted average of tariffs as the explanatory variable. Column (1) controls for total expenditure as defined in the main body of the chapter, while column (2) controls for domestic expenditure only. Column (3) and (4) omit these controls and incorporate them into the explained variable: Column (3) regresses imports as a share of total expenditure on average tariffs and column (4) does the same for imports as a share of domestic expenditure. Column (3) is the version reported in the main body of the chapter. All variables are in logs. The results show that the estimated top-level elasticity is fairly robust and falls between 1.169 and 1.202 depending on specification.

D.6 Implementation of the Model in MPSGE

I use the MPSGE solver in the GAMS software package to simulate the counterfactuals. MPSGE stands for Mathematical Programming System for General Equilibrium Analysis.

Figure D.4: Alternative specifications

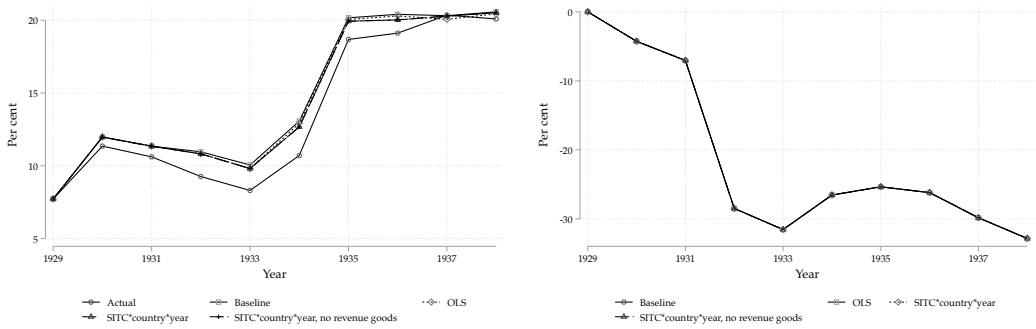


Figure D.5: Alternative values for γ

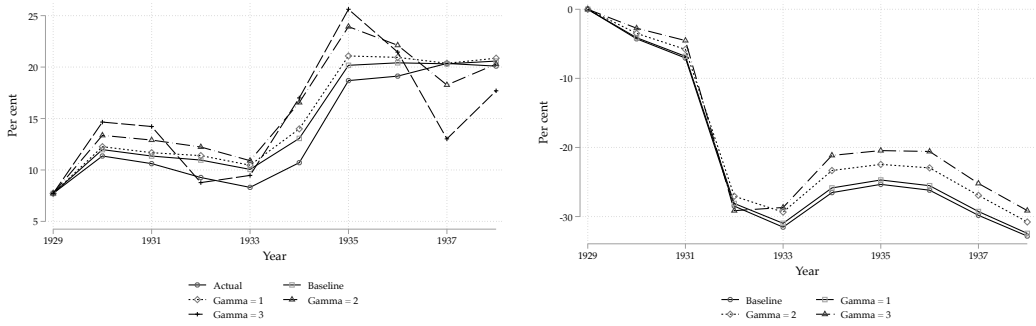


Figure D.6: Alternative values for κ

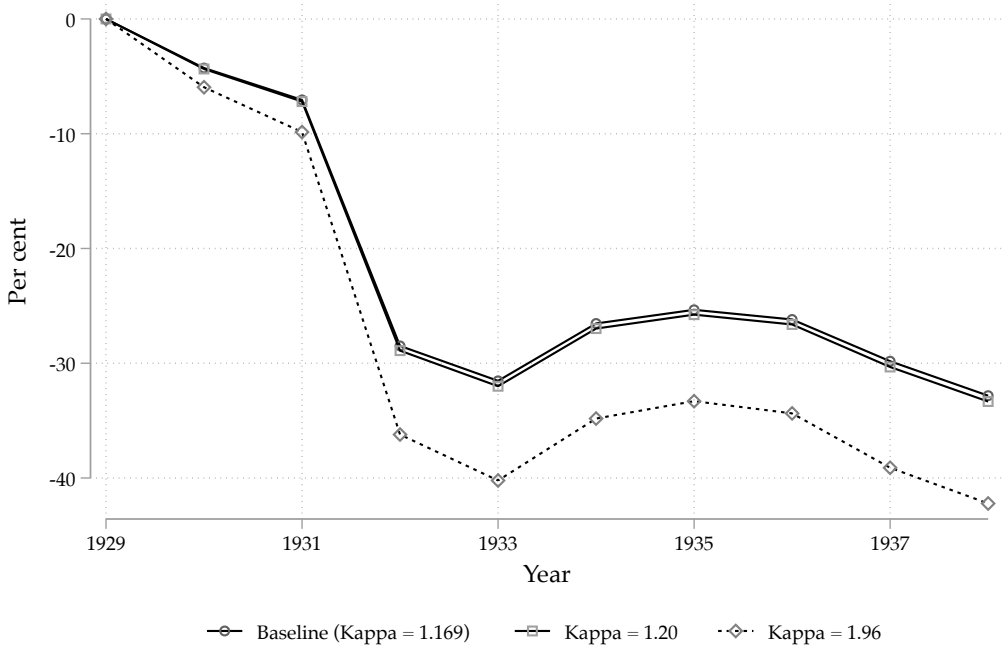
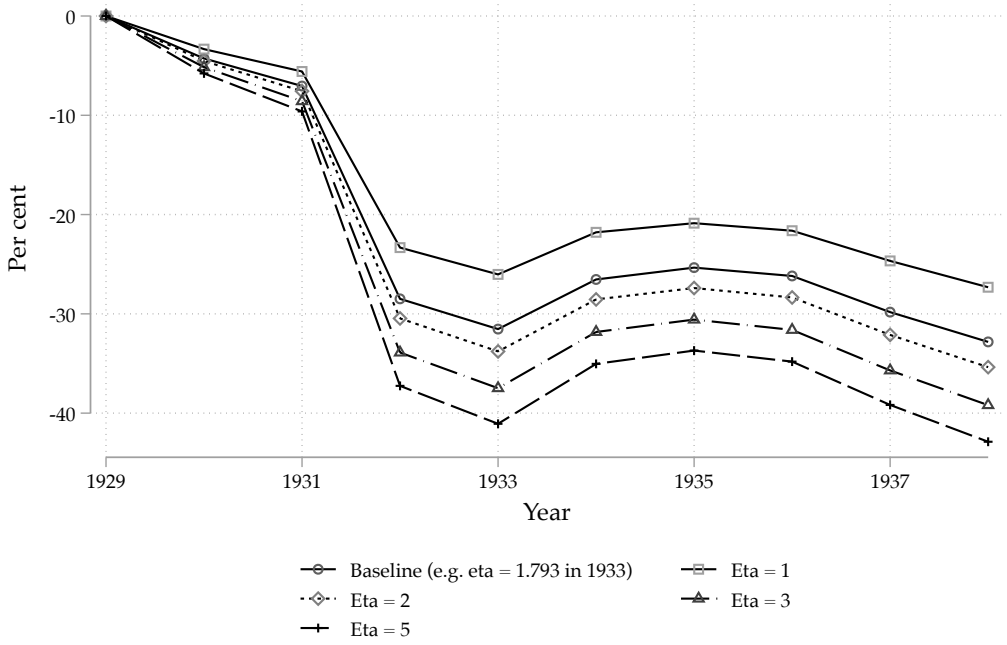


Figure D.7: Alternative values for τ



An MPSGE model is divided into five sections: `$SECTORS`, `$COMMODITIES`, `$CONSUMERS`, `$PROD`, and `$DEMAND`. The first three of these are just variable declarations. Corresponding to their self-explanatory names, they define the sectors, commodities, and consumers in the model. The model used in this chapter has four defined groups of sectors, the first three of which represent the three-level structure of the nested utility function:

- one importing sector `IM(G,R)$IMPGR(Y,G,R)` for each variety (particular good from a particular country) imported
- one sector `ARM(G)$IMPORT(Y,G)` for each Armington aggregate of varieties that blends imports from different countries for a particular good
- a sector `IMPORTGOOD` that blends all imported goods from the second sector into one composite imported good

- a domestic production sector PRODUCTION that transforms GDP into domestic output and exports

```
$SECTORS:
IM(G,R)$IMPGR(Y,G,R)    !  SECTORS IMPORTING GOOD G FROM COUNTRY
R IN YEAR Y
ARM(G)$IMPORT(Y,G)      !  SECTORS BLENDING VARIETIES OF GOODS
IMPORTGOOD              !  SECTOR BLENDING IMPORTS INTO COMPOSITE
IMPORTED GOOD
PRODUCTION              !  SECTOR TRANSFORMING GDP INTO DOMESTIC
OUTPUT AND EXPORTS
```

The variables are defined for a given year Y, country R, and good G. The $COMMODITIES section defines the following commodities

- one commodity PG(G,R)$IMPGR(Y,G,R) for each variety imported
- one commodity PA(G)$IMPORT(Y,G) for each Armington aggregate for a given good
- a commodity PIMP for the composite of all imported goods
- a domestic consumption aggregate commodity PDOMESTIC
- the German Gross Domestic Product in a given year, PGDP
- aggregate exports PEXPORTS

```
$COMMODITIES:
PG(G,R)$IMPGR(Y,G,R)    !  PRICE OF GOOD G PRODUCED IN COUNTRY R
IN YEAR Y
PA(G)$IMPORT(Y,G)       !  PRICE OF THE ARMINGTON AGGREGATE FOR GOOD
G IN YEAR Y
```

```
PIMP                    !  PRICE OF THE COMPOSITE IMPORTED GOOD
PDOMESTIC               !  PRICE OF DOMESTICALLY CONSUMED OUTPUT
PGDP                    !  PRICE OF GDP
PEXPORTS                !  PRICE OF EXPORTS
```

Each of the commodities is defined by its value in Reichsmark.

Finally the model includes one representative agent for a given year in the `$CONSUMERS` section.

```
$CONSUMERS:
RA      !REPRESENTATIVE AGENT IN YEAR Y
```

The remaining two sections describe the underlying equations in a non-algebraic way.[4] The importing sectors' budget is determined by the value of export since trade is assumed to be balanced. The model defines the input as the sum of exports and the output. Every sector is defined by its own production function. For the variety level sector, `IM(G,R)$IMPGR(Y,G,R)`, the input is the sum of exports at world prices, since trade is assumed to be balanced, with a tax equivalent to the tariff and other trade policies' tariff equivalent, `TARIFFALL(G,R)`, and the output is the value of imports at domestic prices in a given year.

```
$PROD: IM(G,R)$IMPGR(Y,G,R)
I: PEXPORTS     Q: IMPGR(Y,G,R)         A:RA    T: (TARIFFALL(G,R))
O: PG(G,R)      Q: DOMPRICE(Y,G,R)
```

Each of these varieties is then blended into an aggregate of the specific good out of all varieties from all countries, taking the output as the first sector as an input with the elasticity of substitution given by `ARMELAS(G)`, which is the good-specific σ_h from the main body of the paper. The output is

4. T. F. Rutherford, "Economic equilibrium modeling with GAMS," 1998, 9.

the total import for a good G, PA(G), with both input and output priced at domestic prices.

```
$PROD: ARM(G)$IMPORT(Y,G)        s:  ARMELAS(G)
I: PG(G,R)$IMPGR(Y,G,R)          Q: DOMPRICE(Y,G,R)
O: PA(G)         Q: DOMPRICEIMPORT(Y,G)
```

The most aggregate level sector then takes as input the total imports of each good from all countries, PA(G), in a given year and blends them into a composite import good, PIMP, both at domestic prices. The elasticity of substitution here, ESUBIMP, is the elasticity γ from the main body of the paper.

```
$PROD: IMPORTGOOD        s:  ESUBIMP
I: PA(G)         Q: DOMPRICEIMPORT(Y,G)
O: PIMP          Q: DOMPRICETOTALIMPORTS(Y)
```

Finally a domestic production sector takes GDP as its input and generates two outputs: exports, PEXPORTS, and domestic consumption, PDOMESTIC. The elasticity here is ELASTRANS, which is the elasticity of transformation η as defined in the text.

```
$PROD: PRODUCTION        t:  ELASTRANS
I: PGDP          Q: SCALEDGDP(Y)
O: PEXPORTS      Q: TOTALIMPORTS(Y)
O: PDOMESTIC     Q: DOMESTICCONS(Y)
```

The last section of the model is the demand function. The representative consumer, RA, is endowed with GDP and consumes the aggregate of all imports, PIMP, and the aggregate of domestically produced goods without exports, PDOMESTIC at a ratio determined by the elasticity ESUBTOPLEVEL, which is κ in the text.

```
$DEMAND:RA      s:  ESUBTOPLEVEL
E: PGDP         Q: SCALEDGDP(Y)
D: PDOMESTIC    Q: DOMESTICCONS(Y)
D: PIMP         Q: DOMPRICETOTALIMPORTS(Y)
```

Table D.1: Germany's memberships in international cartels

Name	goods incl.	start year	end year	countries
Alkalis	317V	1924	1939	United States, UK, Belgium
Electric cables	909	1928	1939	UK, France, Belgium, Austria, Switzerland, Spain, Sweden, Poland, Norway, Finland, Netherlands, Italy, Denmark, Czechoslovakia, Hungary
Heavy electr. equipment	907-912	1930	1944	United States, UK, Switzerland
Incandescent lamps	910, 911	1924	1939	Austria, Netherlands, Sweden, Switzerland, Hungary
Lead	788c	1930	1932	UK, Mexico, Spain
		1938	1939	United States, UK, Mexico, Argentina, Peru
Linen	472, 473, 474	1925	1940	UK, France, Switzerland, Czechslovakia
Magnesium	317V4	1931	1942	United States
Nitrogen	317V5, 362	1929	1930	UK, Norway, Chile
		1930	1931	UK, France, Belgium, Norway, Netherlands, Poland, Czechoslovakia, Italy
		1932	1939	UK, France, Belgium, Norway, Poland, Netherlands, Italy, Switzerland, Czechoslovakia, Chile, Japan
Potash	291, 295	1925	1926	France
		1926	1939	France, Spain, Poland, Palestine
Rayon	400, 399, 405, 408	1927	1939	UK, Italy
Rubber	98, 574-576	1929	1939	United States
Steel	770-799	1926	1929	France, Belgium, Luxemburg, Saarland, Austria, Hungary, Czechoslovakia
		1930	1931	France, Belgium, Luxemburg, Saarland, Austria, Hungary, Czechoslovakia
		1933	1939	France, Belgium, Luxemburg, United States, UK, Czechoslovakia, Poland, Austria, Hungary
Sugar	176, 177	1931	1935	Belgium, Hungary, Poland, Czechoslovakia, Cuba, Japan, Peru
		1937	1939	United States, UK, France, Belgium, Austria, Hungary, Czechoslovakia, USSR, Yugoslavia
Titanium	869B, 777B	1920	1943	United States, Norway
Copper	869, 870, 871, 872, 877	1926	1930	United States, UK, France
Petroleum	239, 240, 241, 243, 249, 251	1929	1938	all but USSR

Table D.2: Goods included by SITC categories

0	Food and live animals	001	Live animals
		011	Meat, fresh
		012	Meat, dried etc.
		023	Butter
		025	Eggs
		041	Wheat, unmilled
		042	Rice
		043	Barley
		044	Maize
		045	Other cereals
		061	Sugar
		071	Coffee
		074	Tea and mate
1	Beverages and tobacco	121	Tobacco, unmanufactured
2	Crude materials	211	Hides and Skins, undr.
		221	Oilseeds, etc.
		231	Crude rubber
		261	Silk, raw
		262	Wool, Angora, etc.
		263	Cotton raw and linters
		271	Fertilizers, crude
3	Mineral fuels	311	Coal, coke, briquettes
		312	Petroleum, crude
		313	Petroleum, refined
4	Oils, fats and waxes	412	Vegetable oils (non-essent)
5	Chemicals	561	Fertilizers, manufactured
6	Manufactured goods	629	Rubber manufactured articles
		651	Textile yarn and thread
		652	Cotton fabrics woven
		653	Textile fabrics standard
		681	Iron and Steel
		682	Copper
7	Machinery	711	Power generating machinery
		712	Agric Mach and Implem
		713	Tractors other than steam
		714	Office machinery
		715	Metalworking machinery
		716	Other machinery
		721	Electrical mach, appl etc
		732	Road motor vehicles
		734	Aircraft

Table D.3: 10 biggest import categories in the 530 good sample by value in Reichsmark

	1925		1928		1931		1934		1937	
	good	Mill RM	good	Mill RM	good	Mill RM	good	Mill RM	good	Mill RM
1	Cotton, raw	831.1	Cotton, raw	738.0	Cotton, raw	315.6	Cotton, raw	231.2	Cotton, raw	228.8
2	Wheat	471.3	Wheat	571.4	Tobacco, raw	222.7	Tobacco, raw	176.1	Tobacco, raw	194.0
3	Butter	372.3	Butter	435.5	Coffee, raw	222.5	Merino Wool	118.9	Corn and Dari	178.1
4	Tobacco, raw	343.8	Merino Wool	380.3	Butter	219.8	Eggs	80.8	Wheat	159.3
5	Merino Wool	299.4	Barley (as fodder)	330.5	Eggs	192.0	Crossbred Wool	80.6	Coffee, raw	151.2
6	Eggs	290.8	Tobacco, raw	313.3	Peanuts	133.8	Copper, raw	79.5	Copper, raw	122.4
7	Copper, raw	278.9	Eggs	311.9	Merino Wool	133.8	Butter	73.7	Butter	115.0
8	Coffee, raw	226.0	Coffee, raw	308.2	Soybeans	131.0	Soybeans	69.1	Rubber	114.2
9	Rubber	176.1	Copper, raw	301.3	Copper, raw	129.6	Coal	66.8	Merino Wool	107.1
10	Peanuts	152.4	Peanuts	251.8	Coal	103.8	Wheat	60.9	Eggs	96.4
Total		7120.3		8333.6		3637.4		2425.5		3028.1

Table D.4: 10 biggest import goods SITC categories in the sample by value in Reichsmark

	1925		1928		1931		1934		1937	
	SITC	Mill RM	SITC	Mill RM	SITC	Mill RM	SITC	Mill RM	SITC	Mill RM
1	Cotton raw and linters (263)	899.3	Oilseeds, etc. (221)	849.8	Oilseeds, etc. (221)	434.7	Wool, Angora, etc. (262)	322.7	Cotton raw and linters (263)	299.4
2	Textile yarn and thread (651)	740.9	Cotton raw and linters (263)	803.8	Cotton raw and linters (263)	336.9	Cotton raw and linters (263)	260.2	Wool, Angora, etc. (262)	285.5
3	Wool, Angora, etc. (262)	626.6	Wool, Angora, etc. (262)	764.2	Wool, Angora, etc. (262)	321.8	Oilseeds, etc. (221)	220.1	Oilseeds, etc. (221)	261.8
4	Oilseeds, etc. (221)	610.4	Textile yarn and thread (651)	573.4	Tobacco, unmanu-factured (121)	223.2	Tobacco, unmanu-factured (121)	176.9	Hides and Skins, undr. (211)	202.7
5	Wheat, unmilled (041)	471.3	Wheat, unmilled (041)	571.4	Coffee (71)	222.8	Iron and Steel (681)	150.0	Tobacco, unmanu-factured (121)	194.6
6	Butter (023)	372.3	Butter (023)	435.5	Butter (23)	219.8	Hides and Skins, undr. (211)	132.4	Maize (044)	178.1
7	Tobacco, unmanu-factured (121)	344.9	Hides and Skins, undr. (211)	417.2	Eggs (25)	204.8	Coffee (71)	119.0	Wheat, unmilled (041)	159.3
8	Copper (682)	325.1	Barley (043)	381.6	Textile yarn and thread (651)	201.7	Textile yarn and thread (651)	116.4	Copper (682)	155.6
9	Eggs (25)	303.9	Copper (682)	346.3	Hides and Skins, undr. (211)	172.3	Coal, coke, briquettes (311)	99.6	Coffee (071)	151.4
10	Hides and Skins, undr. (211)	300.6	Eggs (025)	333.0	Coal, coke, briquettes (311)	148.6	Copper (682)	92.6	Crude rubber (231)	117.5
Total		7120.3		8333.6		3637.4		2425.5		3028.1

Table D.5: 10 biggest import source country in the sample by value in Reichsmark

	1925		1928		1931		1934		1937	
	good	Mill RM	good	Mill RM	good	Mill RM	good	Mill RM	good	Mill RM
1	United States	1460.2	United States	1400.8	United States	381.5	United States	240.5	Argentina	272.0
2	Argentina	527.3	Argentina	822.5	United Kingdom	246.7	Netherlands	123.9	United States	171.8
3	United Kingdom	525.8	United Kingdom	543.3	British India	204.4	United Kingdom	118.4	Brazil	169.5
4	British India	430.0	British India	514.9	China	182.3	Argentina	116.8	United Kingdom	165.4
5	Dutch East Indies	265.7	France	350.9	Netherlands	173.6	China	96.3	Netherlands	110.9
6	Australlia	261.7	Netherlands	327.7	Argentina	165.1	Australia	94.2	British India	107.6
7	Netherlands	233.9	Canada	296.6	France	155.6	France	94.1	Romania	101.1
8	Italy	213.5	Australia	287.0	Belgium-Luxemburg	137.3	Belgium-Luxemburg	92.7	Belgium-Luxemburg	92.0
9	Denmark	211.4	Dutch East Indies	281.5	Dutch East Indies	117.5	Dutch East Indies	91.8	Denmark	89.9
10	Belgium-Luxemburg	207.3	China	274.6	Brazil	109.8	British India	85.4	British Malaya	87.9
Total		7120.3		8333.6		3637.4		2425.5		3028.1

Table D.6: Alternative Specifications for κ: Regression Results

VARIABLES	(1) ln(Imports)	(2) ln(Imports)	(3) $\ln\frac{\text{Imports}}{\text{Total Expenditure}}$	(4) $\ln\frac{\text{Imports}}{\text{Domestic Expenditure}}$
$ln(1+\tau)$	-1.194***	-1.202***	-1.169***	-1.180***
	(0.257)	(0.257)	(0.245)	(0.245)
ln(Total Expenditure)	0.724			
	(0.545)			
ln(Dom. Expenditure)		0.726		
		(0.551)		
Constant	7.440	7.424	4.019***	4.031***
	(6.760)	(6.828)	(0.276)	(0.276)
Observations	14	14	14	14
R-squared	0.708	0.707	0.655	0.660

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

Bibliography

Adam, M. C. *Return of the tariffs: The interwar trade collapse revisited*. Discussion Papers 2019/8. Free University Berlin, School of Business & Economics, 2019.

Adolph, C., G. King, M. C. Herron, and K. W. Shotts. "A consensus on second-stage analyses in ecological inference models." *Political Analysis* 11, no. 1 (2003): 86–94.

Albers, T. N. H. "Currency devaluations and beggar-my-neighbour penalties: evidence from the 1930s." *The Economic History Review* 73, no. 1 (2020): 233–257.

———. "Trade frictions, trade policies, and the interwar business cycle." *European Review of Economic History* 24, no. 3 (2020): 627–628.

———. "Trade Frictions, Trade Policies, andthe Interwar Business Cycle." PhD diss., London School of Economics, 2018.

Amiti, M., S. J. Redding, and D. E. Weinstein. "The impact of the 2018 tariffs on prices and welfare." *Journal of Economic Perspectives* 33, no. 4 (2019): 187–210.

———. "Who's paying for the US tariffs? A longer-term perspective." In *AEA Papers and Proceedings*, 110:541–46. 2020.

Anderson, J. E. "Effective protection redux." *Journal of international economics* 44, no. 1 (1998): 21–44.

———. "Measurement of protection." In *Palgrave handbook of international trade*, 321–348. Springer, 2013.

Anderson, J. E., and J. P. Neary. "A New Approach to Evaluating Trade Policy." *The Review of Economic Studies* 63, no. 1 (January 1996): 107–125.

Anderson, J. E., and J. P. Neary. "Measuring the restrictiveness of international trade policy." *MIT Press Books* 1 (2005).

Anderson, J. E., and J. P. Neary. "Measuring the restrictiveness of trade policy." *The World Bank Economic Review* 8, no. 2 (1994): 151–169.

Anderson, J. E., and E. Van Wincoop. "Gravity with gravitas: a solution to the border puzzle." *American economic review* 93, no. 1 (2003): 170–192.

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

Ariu, A. "Crisis-proof services: Why trade in services did not suffer during the 2008–2009 collapse." *Journal of International Economics* 98 (2016): 138–149.

Arthi, V., M. Lampe, A. R. Nair, and K. H. O'Rourke. *The Impact of Interwar Protection: Evidence from India*. Working Paper, Working Paper Series 27178. National Bureau of Economic Research, May 2020.

Bacon, L. B., F. C. Schloemer, H. C. Taylor, et al. *World Trade in Agricultural Products: Its Growth; Its Crisis; and the New Trade Policies*. International Institute of Agriculture, 1940.

Baldwin, R. "The Greater Trade Collapse of 2020: Learnings from the 2008-09 Great Trade Collapse." *VoxEU.org*, 2020.

Baldwin, R., and S. Evenett. *COVID-19 and Trade Policy: Why Turning Inward Won't Work*. 2020.

———. "The crisis and protectionism: Steps world leaders should take." *VoxEU.org*, 2008.

Baranowski, S. "East Elbian Landed Elites and Germany's Turn to Fascism: The Sonderweg Controversy Revisited." *European History Quarterly* 26, no. 2 (1996): 209–240.

Barmeyer, H., and H. Wallthor. *Andreas Hermes und die Organisationen der deutschen Landwirtschaft: christliche Bauernvereine, Reichslandbund, Grüne Front, Reichsnährstand 1928-1933*. Quellen und Forschungen zur Agrargeschichte. G. Fischer, 1971.

Basch, A. *The New Economic Warfare*. Literary Licensing, LLC, 1941.

Baschuk, B. "WTO Says Global Trade Collapse May Be Worst in a Generation." 2020. Accessed April 21, 2020. https://www.bloomberg.com/news/articles/2020-04-08/wto-says-2020-global-trade-collapse-may-be-worst-in-a-generation.

Becker, H. *Handlungsspielräume der Agrarpolitik in der Weimarer Republik zwischen 1923 und 1929*. Franz Steiner Verlag, 1990.

Beitel, W., and J. Nötzold. *Deutsch-sowjetische Wirtschaftsbeziehungen in der Zeit der Weimarer Republik: e. Bilanz im Hinblick auf gegenwärtige Probleme*. Vol. 3. Nomos, 1979.

Bems, R., R. Johnson, and K.-M. Yi. "The Great Trade Collapse." *Annual Review of Economics* 5, no. 1 (2013): 375–400.

Bevans, C., ed. "Treaty of Peace with Germany (Treaty of Versailles)." In *Treaties and other international agreements of the United States of America, 1776-1949*, 2:43–241. 1969.

Boelcke, W. *Die Deutsche Wirtschaft 1930-1945: Interna des Reichswirtschaftsministeriums*. Droste, 1983.

Borchardt, K. "A Decade of Debate about Brüning's Economic Policy." In *Economic Crisis and Political Collapse: The Weimar Republic 1924-133*. 1990.

———. "Zwangslagen und Handlungsspielräume in der großen Wirtschaftskrise der frühen dreißiger Jahre: zur Revision des überlieferten Geschichtsbildes." In *Bayerische Akademie der Wissenschaften, Jahrbuch 1979*. Vandenhoeck & Ruprecht, 1979.

Borchert, I., and A. Mattoo. "The crisis-resilience of services trade." *The Service Industries Journal* 30, no. 13 (2010): 2115–2136.

Bown, C. P., and M. A. Crowley. *Import protection, business cycles, and exchange rates: Evidence from the Great Recession*. The World Bank, 2012.

Bricongne, J.-C., L. Fontagné, G. Gaulier, D. Taglioni, and V. Vicard. "Firms and the global crisis: French exports in the turmoil." *Journal of international Economics* 87, no. 1 (2012): 134–146.

Broadberry, S. N. "Anglo-German productivity differences 1870–1990: A sectoral analysis." *European Review of Economic History* 1, no. 2 (August 1997): 247–267.

Broadberry, S. N. "How Did the United States and Germany Overtake Britain? A Sectoral Analysis of Comparative Productivity Levels, 1870-1990." *The Journal of Economic History* 58, no. 2 (1998): 375–407.

Broadberry, S., and C. Burhop. "Comparative Productivity in British and German Manufacturing before World War II: Reconciling Direct Benchmark Estimates and Time Series Projections." *The Journal of Economic History* 67, no. 2 (2007): 315–349.

———. "Real Wages and Labor Productivity in Britain and Germany, 1871-1938: A Unified Approach to the International Comparison of Living Standards." *The Journal of Economic History* 70, no. 2 (2010): 400–427.

Broadberry, S., and A. Klein. "Aggregate and per capita GDP in Europe, 1870–2000: continental, regional and national data with changing boundaries." *Scandinavian Economic History Review* 60, no. 1 (2012): 79–107.

Broda, C., and D. E. Weinstein. "Globalization and the Gains From Variety*." *The Quarterly Journal of Economics* 121, no. 2 (May 2006): 541–585.

Bureau of Economic Analysis. *Concepts and Methods of the U.S. National Income and Product Accounts*. Washington, D.C.: U.S. Department of Commerce, 2016.

Burfisher, M. *Introduction to Computable General Equilibrium Models*. Cambridge University Press, 2017.

Calderon, C., A. Chong, and E. Stein. "Trade intensity and business cycle synchronization: Are developing countries any different?" *Journal of international Economics* 71, no. 1 (2007): 2–21.

Capie, F. "Effective Protection and Economic Recovery in Britain, 1932-1937." *The Economic History Review* 44, no. 2 (1991): 339–342.

———. "The British tariff and industrial protection in the 1930's." *The Economic History Review* 31, no. 3 (1978): 399–409.

Chen, B., H. Ma, and D. S. Jacks. "Revisiting the Effective Rate of Protection in the Late Stages of Chinese Industrialisation." *The World Economy* 40, no. 2 (2017): 424–438.

Chernick, M. R. *Bootstrap methods: A guide for practitioners and researchers*. Vol. 619. John Wiley & Sons, 2011.

Child, N. *The Theory and Practice of Exchange Control in Germany: A Study of Monopolistic Exploitation in International Markets*. International Scholars Forum. Springer Netherlands, 1958.

Corden, W. M. "The structure of a tariff system and the effective protective rate." *Journal of Political Economy* 74, no. 3 (1966): 221–237.

Correia, S., P. Guimarães, and T. Zylkin. "PPMLHDFE: Fast poisson estimation with high-dimensional fixed effects." *arXiv preprint arXiv:1903.01690*, 2019.

Crowley, M. A., O. Exton, and L. Han. "The Looming Threat of Tariff Hikes: Entry into Exporting under Trade Agreement Renegotiation." *AEA Papers and Proceedings* 110 (May 2020): 547–51.

Crucini, M. J. "Sources of Variation in Real Tariff Rates: The United States, 1900-1940." *The American Economic Review* 84, no. 3 (1994): 732–743.

Dawletschin-Linder, C. *Die Türkei und Ägypten in der Weltwirtschaftskrise 1929-1933*. Studien zur modernen Geschichte. F. Steiner, 1989.

de Bromhead, A. "Women voters and trade protectionism in the interwar years." *Oxford Economic Papers* 70, no. 1 (June 2017): 22–46.

de Bromhead, A., B. Eichengreen, and K. H. O'Rourke. "Political extremism in the 1920s and 1930s: Do German lessons generalize?" *The Journal of Economic History*, 2013, 371–406.

de Bromhead, A., A. Fernihough, M. Lampe, and K. H. O'Rourke. "The anatomy of a trade collapse: the UK, 1929–1933." *European Review of Economic History* 23, no. 2 (2018): 123–144.

———. "When Britain turned inward: the impact of interwar British protection." *American Economic Review* 109, no. 2 (2019): 325–52.

Diehl, M. *Von der Marktwirtschaft zur nationalsozialistischen Kriegswirtschaft: die Transformation der deutschen Wirtschaftsordnung 1933-1945*. Beiträge zur Wirtschafts- und Sozialgeschichte. Steiner, 2005.

Doering, D. *Deutsche Außenwirtschaftspolitik 1933-1935: die Gleichschaltung der Außenwirtschaft in der Frühphase des nationalsozialistischen Regimes*. Photo copie W. Hilke Kg., 1969.

Düsterwald, W. "Die Pflicht des Staates: Konsequente Handelspolitik." *Vossische Zeitung*, 1932.

Eaton, J., and S. Kortum. "Trade in Goods and Trade in Services." In *World Trade Evolution: Growth, Productivity and Employment*. 2018.

Eaton, J., S. Kortum, B. Neiman, and J. Romalis. "Trade and the global recession." *American Economic Review* 106, no. 11 (2016): 3401–38.

Ebi, M. *Export um jeden Preis: die Deutsche Exportförderung von 1932-1938*. Steiner, 2004.

Eichengreen, B. J. *Golden fetters: the gold standard and the Great Depression, 1919-1939*. NBER series on long-term factors in economic development, 1995.

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.

———. "Trade blocs, currency blocs and the reorientation of world trade in the 1930s." *Journal of International Economics* 38, no. 1 (1995): 1–24.

Eichengreen, B., and K. H. O'Rourke. "A Tale of Two Depressions: What do the new data tell us?" 2010. `https://voxeu.org/article/tale-two-depressions-what-do-new-data-tell-us-february-2010-update#apr609`.

Einzig, P. *Bloodless Invasion: German Economic Penetration Into the Danubian State and the Balkans*. London: Duckworth, 1939.

Ellis, H. "German Exchange Control, 1931-1939: From an Emergency Measure to a Totalitarian Institution." *The Quarterly Journal of Economics* 54, no. 4 (1940): 1–158.

Evans, E. *The German Center Party 1870-1933: A Study in Political Catholicism*. Southern Illinois University Press, 1981.

Evenett, S. "Crisis-era protectionism one year after the Washington G20 meeting." In *The Great Trade Collapse: Causes, Consequences and Prospects*, edited by R. Baldwin. Vox.EU, 2009.

Fajgelbaum, P. D., P. K. Goldberg, P. J. Kennedy, and A. K. Khandelwal. "The return to protectionism." *The Quarterly Journal of Economics* 135, no. 1 (2020): 1–55.

Falkendal, T., C. Otto, J. Schewe, J. Jägermeyr, M. Konar, M. Kummu, B. Watkins, and M. J. Puma. "Grain export restrictions during COVID-19 risk food insecurity in many low-and middle-income countries." *Nature Food* 2, no. 1 (2021): 11–14.

Falter, J. W. "Wählerbewegungen zur NSDAP 1924–1933. Methodische Probleme—abgesicherte Erkenntnisse—offene Fragen." In *Wählerbewegungen in der europäischen Geschichte*, edited by O. Busch, 152–202. Berlin: Colloquium Verlag, 1980.

Falter, J. W., and W. D. Gruner. "Minor and major flaws of a widely used data set: The ICPSR German Weimar Republik Data 1919-1933 under scrutiny." *Historical Social Research/Historische Sozialforschung*, 1981, 4–26.

Federal Trade Commission. *The International Petroleum Cartel*. 1952.

Federico, G., and A. Tena-Junguito. "World Trade, 1800-1938: A New Synthesis." *Revista de Historia Económica / Journal of Iberian and Latin American Economic History* 37, no. 1 (2019): 9–41.

Fremdling, R., and R. Stäglin. "An Input-Output Table for Germany in 1936: A Documentation of Results, Sources and Research Strategy." *Jahrbuch für Wirtschaftsgeschichte/Economic History Yearbook* 55, no. 2 (2014): 187–298.

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

Friedman, P. "The welfare costs of bilateralism: German-Hungarian Trade, 1933-1938." *Explorations in Economic History* 13, no. 1 (1976): 113.

Friedmann, K. J. "German Grain Policies and Prices, 1925-1964." *Food Research Institute Studies* 5, nos. 1387-2016-116066 (1965): 31–98.

Galofré-Vilà, G., C. M. Meissner, M. McKee, and D. Stuckler. "Austerity and the Rise of the Nazi Party." *The Journal of Economic History*, 2021, 1–33.

Gerschenkron, A. *Bread and Democracy in Germany*. Cornell Studies in Security Affairs. University of California Press, 1943.

Gessner, D. *Agrardepression und Präsidialregierungen in Deutschland 1930 bis 1933: Probleme des Agrarprotektionismus am Ende der Weimarer Republik*. Droste, 1977.

———. "Agrarian Protectionism in the Weimar Republic." *Journal of Contemporary History* 12, no. 4 (1977): 759–778.

———. "Agrarprotektionismus und Welthandelskrise 1929/32. Zum Verhaltnis von Agrarpolitik und Handelspolitik in der Endphase der Weimarer Republik." *Zeitschrift fur Agrargeschichte und Agrarsoziologie*, 1978.

Gopinath, G., O. Itskhoki, and B. Neiman. "Trade prices and the global trade collapse of 2008–09." *IMF Economic Review* 60, no. 3 (2012): 303–328.

Gowa, J., and R. Hicks. "Politics, Institutions, and Trade: Lessons of the Interwar Era." *International Organization* 67, no. 3 (July 2013): 439–467.

Greenaway, D., and C. Milner. "Effective protection, policy appraisal and trade policy reform." *World Economy* 26, no. 4 (2003): 441–456.

Greiff, W. *Die neuen Methoden der Handelspolitik*. Junker und Dunnhaupt, 1934.

Grenzebach, W. *Germany's Informal Empire in East-central Europe*. v. 2. 1978.

Grill, J. H. "The Nazi Party's Rural Propaganda Before 1928." *Central European History* 15, no. 2 (1982): 149–185.

Gross, S. G. *Export Empire: German Soft Power in Southeastern Europe, 1890–1945*. Cambridge University Press, 2016.

Grubel, H. G., and P. J. Lloyd. "The empirical measurement of intra-industry trade." *Economic record* 47, no. 4 (1971): 494–517.

Haddad, M., A. Harrison, and C. Hausman. *Decomposing the Great Trade Collapse: Products, Prices, and Quantities in the 2008-2009 Crisis*. Working Paper, Working Paper Series 16253. National Bureau of Economic Research, August 2010.

Hamilton, R. F. *Who voted for Hitler?* [In eng]. Princeton legacy library. Princeton, N.J.: Princeton University Applied Mathematics Research eXpress, 1982.

Hänisch, D. "Inhalt und Struktur der Datenbank "Wahl- und Sozialdaten der Kreise und Gemeinden des Deutschen Reiches von 1920 bis 1933"." *Historical Social Research / Historische Sozialforschung* 14, no. 1 (49) (1989): 39–67.

Hansen, J. *Besondere Tierzuchtlehre*. Edited by F. Aereboe, J. Hansen, T. Roemer, and K. Vormfelde. Vol. 4. Handbuch der Landwirtschaft. P. Parey, 1929.

Harms, B. *Die Zukunft der deutschen Handelspolitik im Rahmen des Neuaufbaus der deutschen Volkswirtschaft und ihrer weltwirtschaftlichen Beziehungen*. v. 1. G. Fischer, 1925.

Hedberg, P., and E. Håkansson. "Did Germany Exploit Its Small Trading Partners? The Nature of the German Interwar and Wartime Trade Policies Revisited from the Swedish Experience." *Scandinavian Economic History Review* 56, no. 3 (2008): 246–270.

Held, H. J. "Chronik der Handelsverträge 1925—1928. Ergänzungen und Register." *Weltwirtschaftliches Archiv* 32 (1930): 283–316.

Held, H. J., and B. A. C. Breycha-Vauthier. "Chronik der Handelsverträge 1925—1927." *Weltwirtschaftliches Archiv* 26 (1927): 391–458.

Hentschel, V. "Zahlen und Anmerkungen zum deutschen Außenhandel zwischen dem ersten Weltkrieg und der Weltwirtschaftskrise." *Zeitschrift für Unternehmensgeschichte / Journal of Business History* 31, no. 2 (1986): 95–116.

Heske, G. "Volkswirtschaftliche Gesamtrechnung DDR 1950-1989. Daten, Methoden, Vergleiche." *Historical Social Research/Historische Sozialforschung. Supplement*, 2009, 1–356.

Hirschman, A. O. *National power and the structure of foreign trade*. University of California Press, 1980.

Hoffmann, W. *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*. Enzyklopädie der Rechts- und Staatswissenschaft. Springer, 1965.

Holtfrerich, C.-L. "Aus dem Alltag des Reichswirtschaftsministeriums während der Großen Inflation 1919–1923/24." In *Das Reichswirtschaftsministerium der Weimarer Republik und seine Vorläufer*, edited by C.-L. Holtfrerich, 224–360. Berlin, Boston: De Gruyter Oldenbourg, 2016.

———. "Deutscher Außenhandel und Goldzölle 1919 bis 1923," 472–484. Berlin, Boston: De Gruyter, 1986.

Höpfner, B. *Der deutsche Außenhandel, 1900-1945: Änderungen in der Waren- und Regionalstruktur*. 05]. Lang, 1993.

Höpfner, H.-P. *Deutsche Südosteuropapolitik in der Weimarer Republik*. Frankfurt: Peter Lang, 1983.

Horowitz, J. L. "The bootstrap." In *Handbook of econometrics*, 5:3159–3228. Elsevier, 2001.

Hubatsch, W., D. Stüttgen, H. Neubach, T. Klein, R. Schütz, K. Friedland, K. Jürgensen, I. Gundermann, F. W. Wehrstedt, and H. bei der Wieden. *Grundriß zur deutschen Verwaltungsgeschichte 1815-1945*. Johann-Gottfried-Herder-Institut, 1975.

Hungerland, W.-F. "On Germany and International Trade in the First Globalisation." PhD Thesis, Humboldt-Universität zu Berlin, 2018.

———. "The Gains from Import Variety in Two Globalisations: Evidence from Germany." *European Historical Economics Society Working Papers*, no. 0120 (2017).

Hungerland, W.-F., and C. Altmeppen. "What is a product anyway? Applying the Standard International Trade Classification (SITC) to historical data." *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 2020, 1–15.

Hungerland, W.-F., and N. Wolf. "The Panopticon of Germany's Foreign Trade, 1880-1913. New Facts on the First Globalization." *CEPR Discussion Paper*, no. DP15988 (2021).

Hungerland, W. "Der deutsche Außenhandel in der Ersten Globalisierung: neue Daten, neue Erkenntnisse." *WISTA–Wirtschaft und Statistik* 72, no. 1 (2020): 65–77.

Inter-university Consortium for Political and Social Research. *German Weimar Republic Data, 1919-1933*, 1984.

Irwin, D. *Trade Policy Disaster: Lessons from the 1930s*. Ohlin Lectures. MIT Press, 2012.

Irwin, D. A. "The Smoot-Hawley tariff: A quantitative assessment." *Review of Economics and Statistics* 80, no. 2 (1998): 326–334.

Jacks, D. S., and D. Novy. "Trade blocs and trade wars during the interwar period." *Asian Economic Policy Review* 15, no. 1 (2020): 119–136.

James, H. "Innovation and conservatism in economic recovery: the alleged 'Nazi recovery' of the 1930s." In *Capitalism in Crisis: International Responses to the Great Depression*, edited by W. R. Garside. 1993.

———. *The end of globalization: lessons from the Great Depression*. Harvard University Press, 2001.

———. *The German slump: Politics and economics, 1924-1936*. Oxford University Press, USA, 1986.

Kaiser, D. *Economic Diplomacy and the Origins of the Second World War: Germany, Britain, France, and Eastern Europe, 1930-1939*. Princeton Legacy Library. Princeton University Press, 1980.

Kee, H. L., C. Neagu, and A. Nicita. "Is protectionism on the rise? Assessing national trade policies during the crisis of 2008." *Review of Economics and Statistics* 95, no. 1 (2013): 342–346.

Kehoe, T. J., and K. J. Ruhl. "How important is the new goods margin in international trade?" *Journal of Political Economy* 121, no. 2 (2013): 358–392.

Kindleberger, C. P. *The terms of trade: a European case study*. Published jointly by the Technology Press of Massachusetts Institute of . . ., 1956.

King, G. *A solution to the ecological inference problem: Reconstructing individual behavior from aggregate data*. Princeton University Press, 1997.

King, G., O. Rosen, M. Tanner, and A. F. Wagner. "Ordinary economic voting behavior in the extraordinary election of Adolf Hitler." *The Journal of Economic History* 68, no. 4 (2008): 951–996.

Kitson, M. "The move to autarky: The political economy of Nazi trade policy." *DAE Working Paper*, no. 9201 (1992).

Kitson, M., and S. Solomou. "Bilateralism in the interwar world economy." *Bulletin of Economic Research* 47, no. 3 (1995): 197–219.

Kitson, M., S. Solomou, and K. Michael. *Protectionism and economic revival: the British inter-war economy*. Cambridge University Press, 1990.

Kitson, M., S. Solomou, and M. Weale. "Effective protection and economic recovery in the United Kingdom during the 1930s." *The Economic History Review* 44, no. 2 (1991): 328–338.

Klasing, M. J., and P. Milionis. "Quantifying the evolution of world trade, 1870–1949." *Journal of International Economics* 92, no. 1 (2014): 185–197.

Klug, A. "Why Chamberlain failed and Bismarck succeeded: The political economy of tariffs in British and German elections." *European Review of Economic History* 5, no. 2 (2001): 219–250.

Kocka, J. "German history before Hitler: The debate about the German Sonderweg." *Journal of Contemporary History* 23, no. 1 (1988): 3–16.

Koenig, C. "Loose cannons – war veterans and the erosion of democracy in Weimar Germany." *Warwick Economics Research Paper Series*, no. 1079 (2015).

Kolb, E. *The Weimar Republic*. Taylor & Francis, 2005.

Kommunistische Partei Deutschlands. *Bericht über die Verhandlungen des X. Parteitages der Kommunistischen Partei Deutschlands:(Sektion der Kommunistischen Internationale): Berlin vom 12. bis 17. Juli 1925*. Vereinigung Internationaler Verlagsanstalten, 1926.

Kowal, S. "Der deutsch-polnische Handel, 1900 bis 2006." In *Interesse und Konflikt: zur politischen Ökonomie der deutsch-polnischen Beziehungen, 1900-2007*, edited by D. Bingen, P. Loew, and N. Wolf. 2008.

Krüger, P. *Die Außenpolitik der Republik von Weimar*. Wissenschaftliche Buchgesellschaft, 1985.

Lampe, J. *Balkans into Southeastern Europe, 1914-2014: A Century of War and Transition*. Palgrave Macmillan, 2006.

Länderrat des Amerikanischen Besatzungsgebietes. *Statistisches Handbuch von Deutschland 1928-1944*. 1949.

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

Lehmann, S. H. "The German elections in the 1870s: why Germany turned from liberalism to protectionism." *The Journal of Economic History* 70, no. 1 (2010): 146–178.

Levchenko, A. A., L. T. Lewis, and L. L. Tesar. "The Collapse of International Trade during the 2008–09 Crisis: In Search of the Smoking Gun." *IMF Economic Review* 58, no. 2 (December 1, 2010): 214–253.

Lewinsohn, R. "Entscheidung der Wirtschaft." *Vossische Zeitung*, 1928.

Li, M., E. J. Balistreri, and W. Zhang. "The U.S.–China trade war: Tariff data and general equilibrium analysis." *Journal of Asian Economics* 69 (2020): 101216.

Loose, P. A. F. *Deutschlands Handelsvertragspolitik der Nachkriegszeit*. Bauer, 1939.

Luebbert, G. M. "Social foundations of political order in interwar Europe." *World Politics* 39 (1986): 449.

Madsen, J. B. "Trade barriers and the collapse of world trade during the Great Depression." *Southern Economic Journal*, 2001, 848–868.

Mai, G. *Die Weimarer Republik*. Beck'sche Reihe. Beck, 2009.

Maier, C. S. *Recasting bourgeois Europe: stabilization in France, Germany, and Italy in the decade after World War I*. Princeton University Press, 2015.

Martins, J. O., and S. Araújo. "The Great Synchronisation: tracking the trade collapse with high-frequency data." In *The Great Trade Collapse: Causes, Consequences and Prospects*, edited by R. Baldwin, 101. 2009.

Max Planck Institute for Demographic Research. "Population History GIS Collection." 2011. Accessed May 20, 2021. https://censusmosaic.demog.berkeley.edu/data/historical-gis-files.

Merkenich, S. *Grüne Front gegen Weimar: Reichs-Landbund und agrarischer Lobbyismus 1918-1933*. Beiträge zur Geschichte des Parlamentarismus und der politischen Parteien. Droste, 1998.

Milward, A. S. "The Reichsmark Bloc and the International Economy." In *Aspects of the Third Reich*, edited by H. W. Koch, 331–359. London: Macmillan Education UK, 1985.

Milward, A. "Der deutsche Handel und der Welthandel 1925-1929." In *Industrielles System und politische Entwicklung in der Weimarer Republik*, edited by B. Petzina Dietmar und Weisbrod. Athenäum-Verlag, 1977.

Mitchell, B. *International historical statistics: Europe 1750-1993*. Springer, 1998.

Mitchener, K. J., and K. Wandschneider. "Capital Controls and Recovery from the Financial Crisis of the 1930s." *Journal of International Economics* 95, no. 2 (2015): 188–201.

Mitchener, K. J., K. Wandschneider, K. H. O'Rourke, and N.-A. Dhabi. "The Smoot-Hawley Trade War." *Oxford Economic and Social History Working Papers*, no. 188 (2021).

Neebe, R. *Großindustrie, Staat und NSDAP 1930-1933: Paul Silverberg und der Reichsverband der Deutschen Industrie in der Krise der Weimarer Republik*. Kritische Studien zur Geschichtswissenschaft. Vandenhoeck & Ruprecht, 1981.

Nohlen, D., and P. Stöver. *Elections in Europe : a data handbook* [in eng]. Baden-Baden: Nomos, 2010.

O'Loughlin, J. "Can King's ecological inference method answer a social scientific puzzle: Who voted for the Nazi party in Weimar Germany?" *Annals of the Association of American Geographers* 90, no. 3 (2000): 592–601.

———. "The electoral geography of Weimar Germany: exploratory spatial data analyses (ESDA) of protestant support for the Nazi Party." *Political Analysis* 10, no. 3 (2002): 217–243.

O'Loughlin, J., C. Flint, and L. Anselin. "The geography of the Nazi vote: Context, confession, and class in the Reichstag election of 1930." *Annals of the Association of American Geographers* 84, no. 3 (1994): 351–380.

O'Loughlin, J., C. Flint, and M. Shin. "Regions and Milieux in Weimar Germany: The Nazi Party Vote of 1930 in Geographic Perspective (Regionen und Milieus in der Weimarer Republik: Wählerstimmen im Jahr 1930 für die NSDAP aus geographischer Sicht)." *Erdkunde*, 1995, 305–314.

O'Rourke, K., and J. Williamson. *Globalization and History: The Evolution of a Nineteenth-century Atlantic Economy*. MIT Press, 1999.

O'Rourke, K. H. "Collapsing Trade in a Barbie World." 2009. Accessed April 24, 2021. `http://www.irisheconomy.ie/index.php/2009/06/18/collapsing-trade-in-a-barbie-world/`.

O'Rourke, K. H. "Economic history and contemporary challenges to globalization." *The Journal of Economic History* 79, no. 2 (2019): 356–382.

Organisation for Economic Cooperation and Development. "Details of Tax Revenue - Germany." 2018. Accessed November 8, 2019. `https://stats.oecd.org/Index.aspx?DataSetCode=REVDEU`.

Overy, R. *The Nazi Economic Recovery 1932-1938*. New Studies in Economic and Social History. Cambridge University Press, 1982.

Panzer, A. *Das Ringen um die deutsche Agrarpolitik: von der Währungsstabilisierung bis zur Agrardebatte im Reichstag im Dezember 1928*. Mühlau, 1970.

Petzina, D. *Autarkiepolitik im Dritten Reich: Der nationalsozialistische Vierteljahresplan*. Schriftenreihe der Vierteljahrshefte für Zeitgeschichte. De Gruyter, 1968.

Petzina, D. "Hauptprobleme der deutschen Wirtschaftspolitik 1932/33." *Vierteljahrshefte für Zeitgeschichte* 15, no. 1 (1967): 18–55.

Plaut, T. *Deutsche Handelspolitik*. 2nd ed. B.G. Teubner, 1929.

Pohl, K. *Weimars Wirtschaft und die Außenpolitik der Republik 1924-1926: vom Dawes-Plan zum Internationalen Eisenpakt*. Droste, 1979.

Pomfret, R. *Unequal trade: The economics of discriminatory international trade policies*. Basil Blackwell Oxford, 1988.

Puchert, B. "Einige Probleme des deutschen Außenhandels 1933 bis 1939." *Jahrbuch für Wirtschaftsgeschichte/Economic History Yearbook* 30, no. 1 (1989): 61–82.

Radkau, J. "Entscheidungsprozesse und Entscheidungsdefizite in der deutschen Außenwirtschaftspolitik 1933—1940." *Geschichte und Gesellschaft* 2, no. 1 (1976): 33–65.

Rauch, J. E. "Networks versus markets in international trade." *Journal of international Economics* 48, no. 1 (1999): 7–35.

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

Reichswirtschaftsministerium. *Übersicht über den Stand der wirtschaftspolitischen Beziehungen Deutschlands*, 1928–1938.

Rhoades, S. A. "The Herfindahl-Hirschman index." *Federal Reserve Bulletin* 79 (1993): 188.

Ritschl, A. "Reparation transfers, the Borchardt hypothesis and the Great Depression in Germany, 1929–32: A guided tour for hard-headed Keynesians." *European Review of Economic History* 2, no. 1 (1998): 49–72.

Ritschl, A. O. "Nazi economic imperialism and the exploitation of the small: evidence from Germany's secret foreign exchange balances, 1938-1940." *The Economic History Review* 54, no. 2 (2001): 324–345.

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

Rogowski, R. *Commerce and Coalitions: How Trade Affects Domestic Political Alignments*. Political science. Princeton University Press, 1990.

Roselli, A. *Money and trade wars in interwar Europe*. Springer, 2014.

Ruffin, R. J. "A rehabilitation of effective protection." *Journal of International Trade and Economic Development* 17, no. 3 (2008): 333–342.

———. "The Development of International Trade Theory." In *Palgrave Handbook of International Trade*, 15–38. Springer, 2013.

Ruppert, K. *Im Dienst am Staat von Weimar: das Zentrum als regierende Partei in der Weimarer Demokratie 1923-1930*. Beiträge zur Geschichte des Parlamentarismus und der politischen Parteien. Droste, 1992.

Rutherford, T. F. "Applied general equilibrium modeling with MPSGE as a GAMS subsystem: An overview of the modeling framework and syntax." *Computational economics* 14, nos. 1-2 (1999): 1–46.

———. "Economic equilibrium modeling with GAMS," 1998.

Sächsische Landesanstalt für Landwirtschaft. "Zur Entwicklung der Schweinezucht und -production im Land Sachsen 1850-2000." *Schriftenreihe der Sächsischen Landesanstalt für Landwirtschaft* 8, no. 1 (2003).

Sampson, T. "Brexit: The Economics of International Disintegration." *Journal of Economic Perspectives* 31, no. 4 (November 2017): 163–84.

Schäfer, H. "Despotismus oder Demokratie?" *Vossische Zeitung*, 1930.

Schanbacher, E. *Parlamentarische Wahlen und Wahlsystem in der Weimarer Republik : Wahlgesetzgebung und Wahlreform im Reich und in den Ländern* [in ger]. Kommission für Geschichte des Parlamentarismus und der Politischen Parteien. Beiträge zur Geschichte des Parlamentarismus und der politischen Parteien. Düsseldorf: Droste, 1982.

Schröder, H.-J. "Zur politischen Bedeutung der deutschen Handelspolitik nach dem Ersten Weltkrieg." In *Die deutsche Inflation. Eine Zwischenbilanz*, edited by G. D. Feldman. 1982.

Schröter, V. *Die deutsche Industrie auf dem Weltmarkt 1929 bis 1933: außenwirtschaftliche Strategien unter dem Druck der Weltwirtschaftskrise*. 03. P. Lang, 1984.

Schulz, M. *Deutschland, der Völkerbund und die Frage der europäischen Wirtschaftsordnung, 1925-1933*. Beiträge zur deutschen und europäischen Geschichte. Krämer, 1997.

Silva, J. S., and S. Tenreyro. "The log of gravity." *The Review of Economics and statistics* 88, no. 4 (2006): 641–658.

Sozialdemokratische Partei Deutschlands. *Das Heidelberger Programm : Grundsätze und Forderungen der Sozialdemokratie*. 1925.

Spaulding, R. M. "German Trade Policy in Eastern Europe, 1890-1990: Preconditions for Applying International Trade Leverage." *International Organization* 45, no. 3 (1991): 343–368.

Statistisches Bundesamt, ed. *Statistisches Jahrbuch für die Bundesrepublik Deutschland*. 1950–2018.

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 Dezember*. Reimar Hobbing, 1930–1939.

———. *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1929*. Reimar Hobbing, 1930.

———. *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1931*. Reimar Hobbing, 1932.

———. *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1932*. Reimar Hobbing, 1933.

———. *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1933*. Reimar Hobbing, 1934.

———. *Monatliche Nachweise über den auswärtigen Handel Deutschlands Dezember 1936*. Reimar Hobbing, 1937.

———. *Sondernachweis Der Außenhandel Deutschlands, Juli 1944*. 1944.

———. *Statistik des Deutschen Reichs 403: Berufszählung Ost- und Mitteldeutschland*. 1929.

———. *Statistik des Deutschen Reichs 404: Berufszählung Nord- und Westdeutschland*. 1929.

———. *Statistik des Deutschen Reichs 405: Berufszählung Süddeutschland und Hessen*. 1928.

———. *Statistik des Deutschen Reichs 412: Landwirtschaftliche Betriebszählung*. 1929.

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

———. *Statistisches Jahrbuch für das Deutsche Reich*. 1930.

———, ed. *Wirtschaft und Statistik*, 12 1935.

Stegmann, D. "Deutsche Zoll- und Handelspolitik 1924/5-1929 unter besonderer Berücksichtigung agrarischer und industrieller Interessen." In *Industrielles System und politische Entwicklung in der Weimarer Republik*, edited by D. Petzina and B. Weisbrod. Athenäum-Verlag, 1977.

———. "Mitteleuropa 1925–1934: zum Problem der Kontinuität deutscher Außenhandelpolitik von Stresemann bis Hitler." In *Industrielle Gesellschaft und politisches System*, edited by F. Fischer, D. Stegmann, B. J. Wendt, and P.-C. Witt. Dietz, 1978.

Steinberg, J. B. "Brexit and the macroeconomic impact of trade policy uncertainty." *Journal of International Economics* 117 (2019): 175–195.

Stögbauer, C. "The radicalisation of the German electorate: Swinging to the Right and the Left in the twilight of the Weimar Republic." *European Review of Economic History* 5, no. 2 (August 2001): 251–280.

Straumann, T. *1931: debt, crisis, and the rise of Hitler*. Oxford University Press, 2019.

Suslow, V. Y. "Cartel contract duration: empirical evidence from inter-war international cartels." *Industrial and Corporate Change* 14, no. 5 (2005): 705–744.

Teichert, E. *Autarkie und Großraumwirtschaft in Deutschland 1930-1939: Außenwirtschaftspolitische Konzeptionen zwischen Wirtschaftskrise und Zweitem Weltkrieg*. Vol. 30. Oldenbourg, 1984.

Temin, P., and G. Toniolo. *The World Economy between the Wars*. Oxford University Press, 2008.

Thurner, P. W., A. Klima, and H. Küchenhoff. "Agricultural structure and the rise of the Nazi Party reconsidered." *Political Geography* 44 (2015): 50–63.

Tokarick, S. "A method for calculating export supply and import demand elasticities." *The Journal of International Trade & Economic Development* 23, no. 7 (2014): 1059–1087.

Tooze, A. *The Wages of Destruction: The Making and Breaking of the Nazi Economy*. Penguin Books Limited, 2007.

Tooze, A. "The Economic History of Nazi Germany." In *Nazi Germany*, edited by J. Caplan. 2008.

———. "Trouble with Numbers: Statistics, Politics, and History in the Construction of Weimar's Trade Balance, 1918–1924." *The American historical review* 113, no. 3 (2008): 678–700.

———. "Wirtschaftsstatistik im Reichswirtschaftsministerium, in seinem Statistischen Reichsamt und im Institut für Konjunkturforschung." In *Das Reichswirtschaftsministerium der Weimarer Republik und seine Vorläufer*, edited by C.-L. Holtfrerich. De Gruyter, 2016.

Tooze, A., and T. Fertik. "The world economy and the great war." *Geschichte und Gesellschaft* 40, no. 2 (2014): 214–238.

Tooze, J. *Statistics and the German State, 1900-1945: The Making of Modern Economic Knowledge*. Cambridge University Press, 2001.

Törnqvist, L., P. Vartia, and Y. O. Vartia. "How Should Relative Changes be Measured?" *The American Statistician* 39, no. 1 (1985): 43–46. eprint: `https://doi.org/10.1080/00031305.1985.10479385`.

Torp, C. *Die Herausforderung der Globalisierung: Wirtschaft und Politik in Deutschland 1860-1914*. Vol. 168. Vandenhoeck & Ruprecht, 2005.

———. *The challenges of globalization: economy and politics in Germany, 1860-1914*. Berghahn Books, 2014.

Ullstein-Nachrichtendienst. "Graham fordert freien Handel." *Vossische Zeitung*, 1930.

United States Tariff Commission. *Foreign-trade and exchange controls in Germany: A report on the methods and policies of German foreign-trade control, with special reference to the period 1931 to 1939*. Washington, D.C.: U.S. Govt. Print. Off., 1943.

Volkmann, H.-E. "Außenhandel und Aufrüstung in Deutschland 1933-1939." In *Ökonomie und Expansion*, edited by B. Chiari, 103–144. Oldenbourg Wissenschaftsverlag, 2009.

———. "Polen im politisch-wirtschaftlichen Kalkül des Dritten Reiches 1933-1939." In *Ökonomie und Expansion*, edited by B. Chiari, 207–223. Oldenbourg Wissenschaftsverlag, 2009.

von Radiis, G. R. "Die deutsche Außenhandelspolitik unter dem Einfluß der Devisenbewirtschaftung von 1931 bis 1938." PhD diss., University of Zurich, 1939.

"Warum wieder wählen?" *Vorwärts*, 1932.

"Export schafft Arbeit." *Vossische Zeitung*, 1930.

Wagemann, E., ed. *Die Bedeutung des Außenmarktes für die deutsche Industriewirtschaft*. Sonderhefte des Instituts für Konjunkturforschung 41. Berlin: Hanseatische Verlagsanstalt Hamburg, 1936.

Whaley, J. "Helmuth Plessner and The Delayed Nation." *Journal of European Studies* 50, no. 1 (2020): 128–140.

Winkler, H. *Weimar 1918 - 1933: die Geschichte der ersten deutschen Demokratie*. Beck, 1998.

Winkler, H. A. *Der lange Weg nach Westen: Deutsche Geschichte vom "Dritten Reich" bis zur Wiedervereinigung*. Vol. 2. CH Beck, 2000.

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.

Wolff-Rohé, S. *Der Reichsverband der Deutschen Industrie 1919-1924/25*. Lang, 2001.

World Trade Organization. "Trade shows signs of rebound from COVID-19, recovery still uncertain." 2020. Accessed October 13, 2020. https://www.wto.org/english/news_e/pres20_e/pr862_e.htm.

———. "World trade primed for strong but uneven recovery after COVID-19 pandemic shock." 2021. Accessed October 13, 2020. https://www.wto.org/english/news_e/pres21_e/pr876_e.htm.

Yilmazkuday, H. *The Great Trade Collapse: An Evaluation of Competing Stories*. Technical report. 2019.