# The consequences of a trade collapse: Economics and politics in Weimar Germany *

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October 13, 2023

**Abstract**

Germany's exports declined by 67% between 1928–1932. To what extent did this contribute to the Nazi success? What was the role of sectoral linkages? To answer these questions we use newly digitized data to construct local shock exposure measures. We show that counties more severely affected experienced a smaller increase in Nazi support and argue that this can be explained by the party's economic policies. On the other hand, shock-induced declines in cities' food demand spread hardship to their hinterlands. Importantly, in those areas voters were lured to the Nazis by their pro-agriculture policies and scapegoating of Jewish middlemen.

**JEL Classifications**: F14, F44, N14, N44
**Keywords**: Great Depression, Trade, Extremism, Nazi Party, Germany

*We would like to thank Rodrigo Adão, Thilo Albers, Toman Barsbai, Davide Cantoni, Paola Conconni, Florin Cucu, Douglas Irwin, Felix Kersting, Markus Lampe, Luis Martinez, Mattia Nardotto, Cecilia Garcia-Peñalosa, Ronny Razin, Kevin O'Rourke, Devesh Rustagi, Jochen Streb, Cecilia Testa, Federico Trionfetti, Hans-Joachim Voth, Nikolaus Wolf, Noam Yuchtman, Ariel Zimran and Yanos Zylberberg as well as conference audiences at the 19th GEP/CEPR Annual Postgraduate Conference, 16th ACEGD Delhi, 14th Ruhr Graduate School Workshop, 4th Market Studies and Spatial Economics workshop Brussels, CEPR-PSE policy forum 2023, SETC Cagliari 2023 and seminar audiences at the University of Nottingham, ECARES Universite Libre de Bruxelles, Aix-Marseille School of Economics, GSIPE, University of Konstanz, WU Vienna, University of Mannheim, Humboldt University Berlin, CEPR International Macroeconomic History Online Seminar Series, University of Oxford for very useful comments.
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*"It is worth every effort to try to defuse this conflict [US tariffs on EU imports] so that it doesn't turn into a real [trade] war, but of course there are two sides to that"*, Angela Merkel (July 20, 2018)

# 1 Introduction

The GATT/WTO system successfully managed to promote rule-based trade integration in the post World War II era. Over the past several years, this progress has been undermined by the emergence of a new wave of protectionism, originating in the United States, but subsequently embraced by a number of other countries (including China, the EU, Canada, Mexico, etc.). While initially blamed on the actions of the Trump administration aimed at "making America great again", the fact that these policies continue to be in place today suggests that we might be facing a prolonged period of de–globalization and an erosion of the multilateral trading system (Mattoo & Staiger 2020).

As the consequences of this process will play out over the next decades, scholars have been increasingly looking at the past to gain insights on what might happen in the future. Much of the attention has been focused on the Great Depression and on the formation of trade policy and blocs during this period (e.g. Evenett 2019; De Bromhead et al. 2019; Mitchener et al. 2022). At the same time, the effects of the de–globalization on the rise of extreme political parties have not yet been fully understood. Making progress in this area is important, as these political forces have been recently gaining ground in many Western countries.[1]

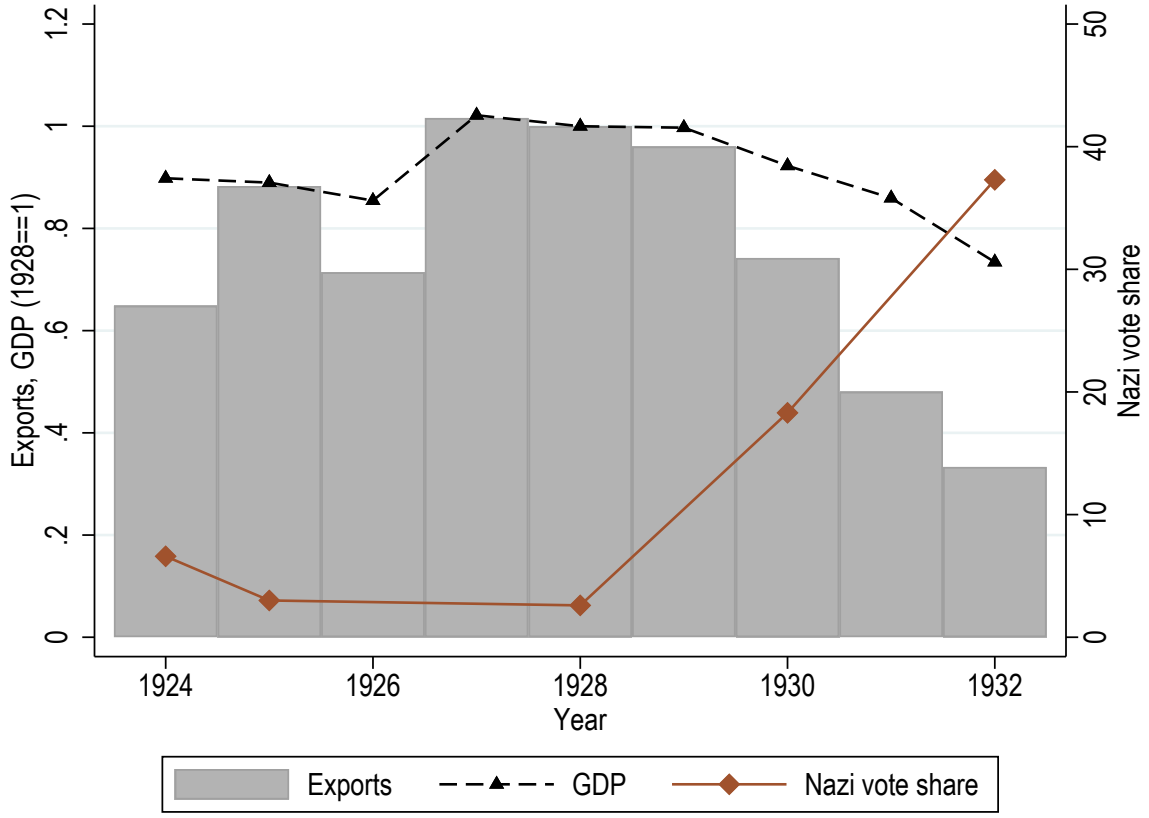
This paper examines the political repercussions of de–globalization by focusing on interwar Germany. As shown in Figure 1, German exports fell by 67% percent between 1928 and 1932 (equivalent to an 8.3 % decline of 1928 GDP).[2,3] Over the same time period, GDP fell by 27%, and democracy collapsed in the Weimar Republic, with Hitler's National Socialist German Workers' Party (NSDAP, commonly known as the Nazi party) growing from a small political force in 1928 – capturing only 2.6% of the suffrage – to the largest party in the June 1932 election, with 37.3% of the votes. To what extent was the rise of the Nazi party due to the trade collapse? What was the role of sectoral linkages in explaining this?

[1] See Guriev & Papaioannou 2022 for a literature review.

[2] The percentage has been obtained dividing the 6'289 million Reichsmark decline in exports between 1928-32 (Statistisches Reichsamt 1928-1932) by the 75'373 million Reichsmark GDP in 1928 ("Volkswirtschaftliche Bilanz" Statistisches Reichsamt 1925-1938).

[3] German imports also fell significantly during this period, but this was not due to an increase in protectionism, but rather to a collapse in German domestic demand, and the simultaneous unavailability of the foreign currency needed to purchase imported goods. The Reichsbank in particular introduced exchange controls, providing importers with only a fraction of the foreign exchange available before the crisis (Tooze 2007, p.20ff).

FIGURE 1: EXPORTS, ECONOMIC ACTIVITY AND NAZI VOTE SHARE




Notes: The figure depicts German exports and economic activity (GDP) relative to 1928 (left y-axis). It also plots Nazi vote share (NSFB/NSDAP) in parliamentary elections (right y-axis). May 1924 election plotted for 1924 and December 1924 election for 1925. Source: Exports - Statistisches Reichsamt 1928-1932; GDP - Albers 2020; Nazi vote share ICPSR 2005.

To explore the impact of the decline in demand for German exports (henceforth export shock) on economic activity and politics in this period, we combine newly digitized data on employment by industry and county ("Landkreise") from the 1925 Census and exports by product between 1928–32 from the German Trade Statistics. The concentrated and well-delineated economic geography of this export shock allows us to explore the linkages between economic and political outcomes across Germany at the time. An important empirical concern is that the export shock might be shaped by factors within Germany, which also affect other economic and political outcomes. To overcome this challenge we use newly digitized product level trade data on US imports from Germany's main competitors (France and the United Kingdom) to build a plausibly exogenous instrument.

We begin the analysis by evaluating the effects of the export shock on economic hardship across German cities. We find that greater exposure to this event led to a drop in local economic activity, as measured by an array of outcomes, including electricity consumption, local commuting as well as income-, corporate- and consumption-tax revenues. The export shock caused also an increase in unemployment in cities more exposed to it. In

addition, we document that it had indirect repercussions across Germany. In particular, as cities' local economies collapsed, the price of food items produced in their agricultural hinterlands declined.

Using detailed election outcome data, we next examine the political consequences of the trade collapse. We find that areas more exposed to the export decline experienced a *smaller* increase in support for Hitler's party, as political forces representing the economic interests of middle-class voters held their ground. Furthermore, we also document gains for the communist party, especially outside their traditional strongholds. A plausible explanation for this result is that the economic policies proposed by the Nazi party – draconian cuts in unemployment benefits and their replacement with "work and bread" infrastructure building programs – did not appeal to important sections of the electorate (Childers 2010).[4] To explore this idea, we construct occupation–specific measures of exposure to the shock, distinguishing among white–collar, blue–collar and self–employed workers. Our findings indicate that areas where the shock was especially severe for white–collar workers experienced the largest decline in Nazi party support. Areas in which instead the shock affected mainly blue–collar workers saw a modest increase in support for Hitler's movement, whereas no clear pattern emerges for self–employed workers. These results are in line with the anecdotal evidence suggesting that white–collar manufacturing workers had a lot to lose from the economic policies proposed by the Nazis, as they would have undermined their higher economic standing based on performing non-manual work and enjoying better overall working conditions. At the same time, blue–collar workers were likely to find the proposed programs more attractive as they focused on providing unskilled employment opportunities. In additional results, we also document that the decline in Nazi support due to the shock was particularly strong in the presence of a high share of female workers – consistent with the idea that working women found the Nazi party's rhetoric about their purely domestic role in society not particularly attractive.

Finally, we explore the indirect consequences of the export decline. To this end we build gravity based measures of exposure to locations that were directly impacted by the shock, based on their demand and trade costs.[5] Building on earlier work by Wolf (2009), we construct these measures in two ways: First, we use effective geographic distance. Second, we exploit the effects of internal administrative borders. We uncover that indirect exposure to the export shock increased support for the Nazi party. Exploring the mechanisms behind this result, we show that the effect occurs through urban-rural linkages, i.e. the "indirect" rise in support for the Nazi party is solely driven by agricultural ar-

[4] Voigtländer & Voth (2014) find evidence that the building of the motorway system in 1933 (possibly the most famous "work and bread" project) increased support for the Nazi party after they gained power. However, they argue this was not through direct economic benefits in the form of reduced unemployment, but rather because of the Nazi regime being able to signal its ability to conduct successful policy projects.

[5] The constructed measures are similar to the ones in Adao, Arkolakis & Esposito (2019) exploring the (geographic) indirect effect of the China shock on economic activity across US counties.

eas. Why did farmers exposed to economic hardship react so differently? Once again the Nazi's policy platform is likely to be a key factor. The economic promises of Hitler's party to farmers and agricultural workers were particularly generous, including price controls, a moratorium to foreclosures, and state support.[6]

Motivated by the importance of rural-urban agricultural trade, we investigate whether the indirect export shock was potentially enhanced by the socio-cultural environment, focusing on the role played by latent anti-Semitism (Tilton 1975). Our results indicate that in regions where Jewish middlemen were more relevant, the indirect export shock had the largest impact on support for the Nazi party. This finding is in line with the results of other recent studies (Grosfeld et al. 2020; Doerr et al. 2022), which have emphasized the interplay between anti-Semitism and economic shocks.

Our paper contributes to three main strands of the literature. The first studies the impact of trade shocks on economic (see the seminal work by Autor et al. 2013) and electoral outcomes (Colantone & Stanig 2018*a*; Colantone & Stanig 2018*b*; Dorn et al. 2020; Dippel et al. 2022; Che et al. 2022). This body of work has so far mainly focused on the impact of rising Chinese import competition, emphasizing its effect on support for populist political groups. Our work instead focuses on the political implications of de–globalization, and on whether a decline in exports is also associated with an increase in support for extreme parties.[7] We further contribute to this literature by building on the seminal work by Adao, Arkolakis & Esposito (2019)[8] and exploring the indirect political implications of the foreign demand shock as it spread through the domestic economy. The second strand of the literature we contribute to focuses instead on the role played by economic shocks in shaping the rise of political extremism (De Bromhead et al. 2013) and more specifically of Nazism in Germany (Weck & Frey 1981; Falter et al. (1985); Falter et al. 1986; Falter 1991; Stögbauer 2001; Evans 2005; Childers 2010; Doerr et al. 2022; Galofré-Vilà et al. 2021). We contribute to this body of work by providing causal evidence on the role of declining demand for German exports, and by examining the consequences of both the direct and indirect effects of the trade collapse. Third, by providing evidence on the role played by latent anti–semitism in the growth of Nazi support in the countryside, we contribute also to the recent literature that has studied the role of economic shocks in shaping inter-ethnic conflict (Jha 2013; Grosfeld et al. 2020; Doerr et al. 2022).

[6] After gaining power the Nazis enacted their proposed policies, significantly benefiting farmers (see e.g. Lovin 1969; Spoerer & Streb 2013).

[7] In a recent paper, Campante et al. (2023) study the effect of a negative export shock in an autocratic setting (China), showing that it led to the appointment of more repressive party officials in those areas more exposed to the export decline. Bhavnani & Jha (2014) and Bonfatti & Brey (2023) show that trade disruptions played a role in increasing support for the independence movement in colonial India. However, only the former finds export demand to play an important role, while the later finds solely an effect for declining import competition, but not changes in export demand.

[8] This paper focuses on the spatial interlinkages that explain the spread of the China shock on economic outcomes in the United States.

The remainder of the paper is organised as follows. Section 2 provides the historical context. Section 3 presents the data used in the analysis and our empirical approach. Section 4 documents the economic consequences of the export shock. Section 5 presents the direct political implications of the export shock, while Section 6 studies its indirect effect via linkages with the agricultural sector. Section 7 concludes.

# 2 Historical context

## 2.1 The German economy during the Great Depression

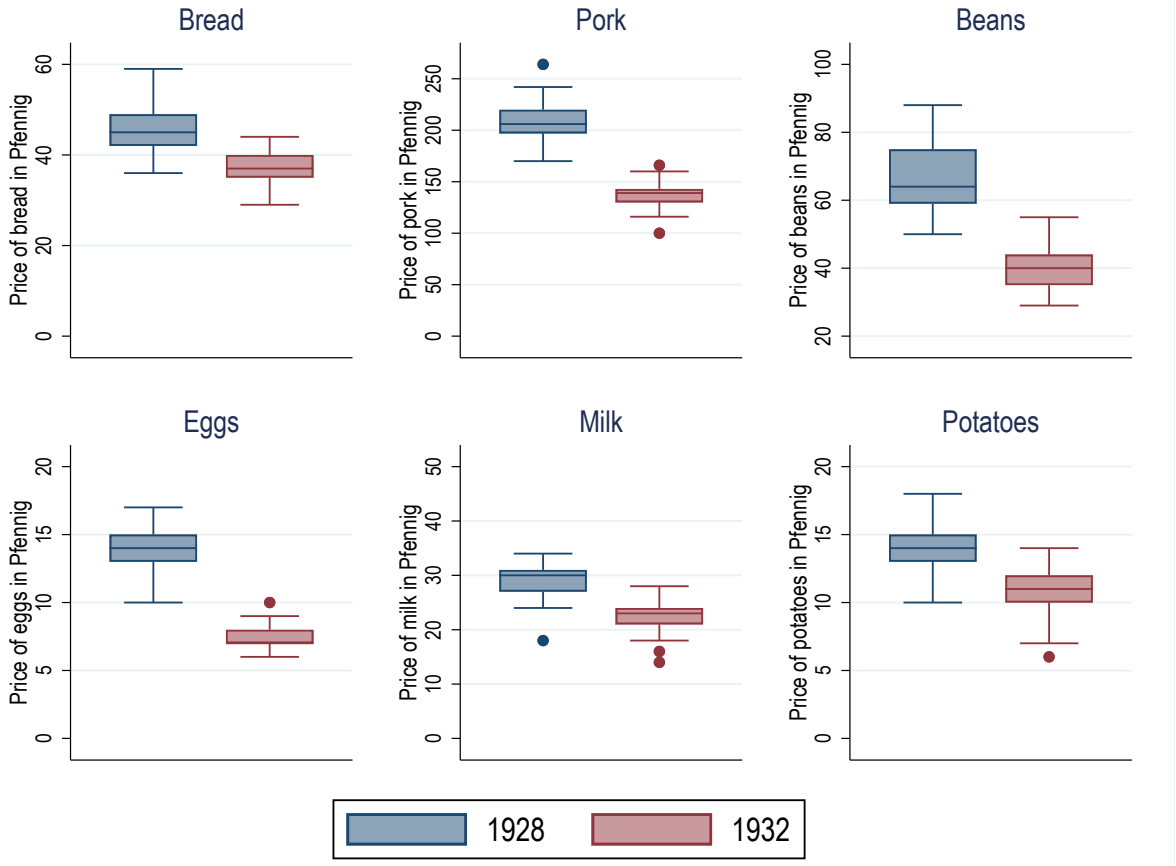
From its origins in the United States the Great Depression quickly spread to other countries (Lewis 1949; Romer 1993). Germany was amongst the countries worst hit.[9] Economic activity fell by about 30% (see Figure 1). Unemployment rose to 6.1 million by 1932, a third of the working age population. The unemployment insurance scheme – designed to accommodate up to 800,000 unemployed per year – was completely overloaded and provided only limited support, especially to the long-term unemployed (Stachura 1986). Even individuals who did not lose their jobs were often put on short working hours and suffered from significant wage cuts. The crisis was not just restricted to manufacturing and urban areas, where the deprivation was most clearly observable via the rise in unemployment. Agriculture suffered as demand for food and its price collapsed. Prices declined on average by 10%-40% (Figure 2).[10] Small-scale farmers were most severely affected. In contrast, tariffs and a shift of consumers to cheaper staple foods protected – to some extent – the usually larger-scale grain producers (Childers 2010, p.147). The figure also highlights considerable dispersion in both prices and their decline across Germany.

Several studies have highlighted the role played by the decline and reorientation of trade flows in worsening the global downturn (Crucini & Kahn 1996; Albers 2020). German exports fell by more than half between 1928 and 1932 (Figure 1). This represented a major economic shock as exports accounted for more than a tenth of German GDP in 1928, i.e. the drop in exports alone was equal to 8.3% of 1928 GDP. Figure A.1 panel B shows that the decline in demand for German exports was particularly large in the origin of the Great Depression, the US, and to a considerable extent this was due to the erection of new tariff barriers with the 1930 Smoot-Hawley Tariff Act. This protectionist entrenchment (Eichengreen & Irwin 2010; De Bromhead et al. 2019; Albers 2019; Mitchener et al. 2022) did no just impact German exports to the US, but was rather the beginning of an all out global trade war.

[9] Appendix Figure A.1 panel A shows Germany and the US were hit most among major industrialized countries. Panel B shows that one mechanism the shock spread from the US to Germany was via declining export demand for German products.

[10] Most varities are comparable across cities, however bread differs considerably by city reflecting the price for the most purchased local variety potentially amplifying the depicted dispersion in prices.

FIGURE 2: FOOD PRICES 1928-32




Notes: The box plots show different food prices across German cities in July 1928 and 1932 collected from Statistisches Reichsamt (1925-1938); Preussisches Statistisches Landesamt (1927-1934) for cities above 50'000 inhabitants. Prices are for similar quality and quantity apart from bread price which is reported as per kg for the most common local variety.

## 2.2 The rise of the NSDAP

During Weimar's "Golden Years" the Nazis were just one of several small "fringe" parties, receiving a mere 2.6% of the votes in the 1928 Reichstag election. However, Weimar politics drastically changed after 1929, becoming increasingly polarised as the Great Depression deepened. In 1930 Müller, the last chancellor commanding a parliamentary majority, resigned due to disagreements in his grand coalition over how to finance the increasing costs of unemployment insurance. He was replaced by Brüning, who governed without a parliamentary majority and enacted severe austerity measures (Bracher 1978). This led to him being dubbed the "hunger chancellor" (Evans 2005). His government collapsed in May 1932, as President Hindenburg withdrew his support, leading to new elections that took place in July 1932. The Nazi party triumphed, winning 37% of the popular vote and becoming the leading political force in the new Reichstag. Despite the electoral success, President Hindenburg was not yet ready to appoint Hitler to lead a government, prefer-

ring more moderate figures. As the political crisis continued to deepen, new elections were called for November 1932. Despite a 4 percentage points decline in Nazi support, Hindenburg appointed Hitler as Reichskanzler on January 30th, opening the way to the Nazi dictatorship.

Various explanations have been proposed for the evolution of Nazi electoral support between 1928–32. First, after the poor showing at the polls in 1928, the party stopped advocating a violent overthrow of the established democratic order, focusing instead on legal means to come to power. This shift increased its appeal with middle- and upper-class voters (Evans 2005; Childers 2010). Importantly, it also helped to establish links with sections of the business and political elites (Ferguson & Voth 2008), leading for example to the cooperation with media baron Alfred Hugenberg and the German National People's Party (DNVP) in the referendum against the "Young Plan".[11]

The party also gained popularity because of the widespread perception among middle class voters that it was the only political force able to oppose the growing "Red Threat" (Childers 2010). Childers (2010) and Spenkuch & Tillmann (2018) suggest that most of the party's electoral gains were among protestant voters, small farmers, and large parts of the middle class – in particular shopkeepers, independent artisans, students, and civil servants. As a result, a diverse set of political parties previously representing protestant rural and middle class interests experienced a large decline in support between 1928 and 1932 as Nazi support increased. In contrast support for the SPD, representing urban blue-collar workers, and Zentrum, the party of German Catholics, remained comparably stable (Appendix Figure C.4).

The Nazi's electoral success coincided with the drastic collapse of the German economy during the Great Depression. A vast body of historical work has explored the relationship between the two, mainly focusing on the role of the unemployed. Initial studies, e.g. Weck & Frey (1981); Stögbauer (2001), provided descriptive evidence supporting the existence of this link. Most subsequent analyses have called these findings into question (see e.g. Falter et al. 1985; Falter 1991; Childers 2010), arguing that the unemployed and workers in the manufacturing sector did not start supporting en mass the Nazi party during the Great Depression. Still, the lack of reliable data and the descriptive nature of most of the analyses imply that more work is needed to answer this question.[12] More generally,

[11]The Young plan was drafted in August 1929 and formally adopted in 1930. The referendum was held despite the Young Plan lessening Germany's World War I reparations, and expedited the end of the Rhineland occupation and international economic controls. The referendum against it was held in December 1929 under the title Freiheitsgesetz ("Freedom Law") and failed due to the low turnout of 14.9% (with a Yes-vote of 94.5%). The law would have unilaterally cancelled all reparation payments, rejected the "war guilt" clause and occupation of territory under the Treaty of Versailles.

[12]Recent well-identified empirical work has instead focused on more narrowly defined economic developments. Doerr et al. (2022) highlights the impact of the 1931 German banking crisis on increasing support for the Nazi party through fostering antisemitism. Galofré-Vilà et al. (2021) emphasize the role of government austerity measures.

scholars have emphasized the heterogeneous political responses of voters to the economic crisis (e.g. King et al. 2008).

## 2.3 Nazi economic policies and their appeal to voters

As argued by Childers (2010), the economic policies proposed by the Nazi party played an important role in shaping the party's electoral support.

The collapse in exports documented in Section 2.1 adversely affected manufacturing workers, but the decline in the price of foodstuff indirectly affected also rural farm-owners and agricultural workers. The Nazi party's policies to address these challenges differed considerably as illustrated in Figure 3. The key initiative to combat the urban manufacturing crisis can be summarized under the slogan of "work and bread" emphasizing increasing labor demand through a manual-labor intensive programs of public work, accompanied by a drastic reduction in unemployment benefits. Proposals for agriculture, in contrast, centered around the introduction of minimum prices and a moratorium on farm foreclosures by banks due to outstanding debts. This was to be complemented by the provision of government loans for land improvements and ones during harvest season (NSDAP 1932).

The Nazis clearly outlined and communicated their proposals to voters, in documents like the "Emergency Economic Program of the NSDAP" (NSDAP 1932), which was circulated in May 1932 just before the election. Importantly, these policies were considered credible at the time —and in fact were later enacted— and vividly discussed by voters and various interest groups.

Within the manufacturing sector, the appeal of Nazi economic proposals differed between white and blue–collar workers. White–collar workers – with their strong anti-proletarian sentiment – could have been an important constituency for the party (Childers 2010). However, the party's economic policies were unlikely to address their predicaments. First, they threatened their higher unemployment benefits as well as their distinct unions, job referral agencies and health insurance plans (Childers 2010, p.90). Second, public works programs were considered extremely unappealing, as they required hard manual work ("shovel in hand to serve the nation though labor" NSDAP 1932, p.32). More generally, these policies threatened the core of white–collar self identification, based on their social and economic distinction from blue-collar workers (Childers 2010, p.89). As a result, white–collar unions (GdA & DHV)[13] rallied their constituencies against the

[13]The GdA "Gewerkschaftsbund der Angestellten" (Union of clerks) was the more liberal white–collar union associated with the DVP "Deutsche Volkspartei" (German People Party), while the DHV "Deutschnationaler Handlungsgehilfenverband" (German-national clerk organization) was more conservative and closer to the DNVP "Deutschnationale Volkspartei" (German National People's Party). Both organization and the respective parties defended separate job referral agencies and health insurance plans for white-collar employees, were strongly antisocialist and objected all mergers of the former with economy-wide agencies (Childers 2010, p.90). Both unions were abolished and absorbed into the sin-

Figure 3: Nazi policies targeted at manufacturing workers and farmers


Notes: Election posters used by the Nazi party. Left poster used in the November 1932 election reading "Work and bread through National Socialism" in front of a running factory. Left poster used in the March 1933 election states: "Free the fields, Peasants vote for Hitler" showing a farmer holding its tools in front of a field with the sign saying "Foreclosed". Source: German Propaganda Archive.

Nazis on economic grounds. For example, the GdA newspaper stated on 1 November 1932 (Childers 2010, p.236): "The Nazis offer nothing to white-collar workers [...] only the risk of proletarization". Instead distressed white–collar voters appear to have continued to support small middle class parties, that were focused on white–collar economic issues and denounced the simplistic solutions of both "red" and "brown" socialism (Childers 2010, p.238).

The fact that females represented a growing proportion of white–collar workers in manufacturing further limited the party's appeal to this group. Women were at risk of being driven out of the labour market if the Nazis came to power. The middle-class DVP ("Deutsche Volkspartei") takes up this issue (Childers 2010, p.239): "In the Third Reich your right to work will be taken away [...] Do you want to sit at home, a burden to those to whom you used to be a support? Do you want your impoverished parents to rot because you are not allowed to earn money? Do you want your abilities to atrophy because the single woman in the Third Reich is treated as an inferior and is forbidden

gle Nazi party union "Deutsche Arbeitsfront" (German Labour Front) with collective bargaining being outlawed in May 1933.

to exercise her talents?". This was especially concerning for families already in economic distress during the crisis (Stachura 1986; Childers 2010). Consistent with the low appeal of Nazi economic solutions, Childers (2010) highlights that the rise in support of white-collar workers in manufacturing was much lower compared to other middle class groups (e.g. retirees, self–employed, government sector employees) less directly exposed to the economic crisis.

Among organised blue–collar workers, which were strongly linked through their unions with the social-democratic SPD ("Sozialdemokratische Partei Deutschlands") or the communist KPD ("Kommunistische Partei Deutschlands"), support for the Nazi party was limited. However, Nazi policies mixing anti-capitalist and anti-Marxist rhetoric were popular with a particularly vulnerable section of German blue–collar workers – the young and those located between white–collar and the main body of the organized working class, e.g. foremen (Stachura 1986; Childers 2010, p.257). For these the Nazi's policies under the slogan "work and bread" had an economic appeal due to their limited access to unemployment benefits and the fact that the proposed programs offered employment opportunities comparable to those they already had.

The Nazi party's agricultural policy had much more clear cut appeal as a solution to the economic crisis faced by farmers. This group had fared badly in the Weimar Republic, even before the crisis with incomes 44 percent below the national average (Childers 2010, p.145, 147). Farmers vocally demanded higher tariffs, lower taxes, cheaper credit, and reduced social welfare expenditures – a set of requests which were well in line with the actual policies proposed by the Nazis during the crisis. Newspapers[14] frequently highlighted the link between the urban economic crisis, declining agricultural prices and farmers supporting the Nazis.[15] The political response is most clearly documented in the left-centrist "Volksfreund" (09.04.1932), which – interviewing farmers in Dietramszell[16] – reports that for them "[...] with the low agricultural prices Hitler was our only option."

Economic self-interest plausibly interacted with other non-economic drivers. Rallies, and mass demonstrations about economic grievances held by farmers were usually accompanied by denunciations of reparation payments, the parliamentary system, and "Jewish international finance" (Childers 2010, p.147). The Nazi's antisemitism plausibly interacted well with the economic shock as for many farmers the face of the shock were middlemen in intermediate trading and banking often perceived to be Jewish.[17] Indeed, Nazi

[14] Available at the "Deutsches Zeitungsportal" https://www.deutsche-digitale-bibliothek.de/newspaper

[15] For example, the "Karlsruher Zeitung" (27.05.1932) links the unemployment and impoverishment in manufacturing to the declining demand and prices for agricultural products and the need to revitalize the economy.

[16] This was remarked upon in regional news as President Hindenburg had a vacation home in the village and was very popular among the WWI veterans that served under his leadership. Despite this Hitler's vote share had been overwhelming in the 1932 presidential election.

[17] See Grosfeld et al. (2020) highlights this middlemen role of the Jewish minority as a major factor in the outbreak of pogroms in the Russian empire.

linked-newspapers blamed the agricultural price decline on the unfair exploitation of "German" farmers by Jewish traders (e.g. Der Führer 05.05.; 27.05.; 23.09.1932; 20.04.1933). As Tilton (1975), p.71, points out: "The Nazis regularly used anti-Semitism to appeal to economic self-interest; they castigated the machinations of Jewish cattle dealers, shopkeepers, and bankers as the source of all economic woes. [...] The Nazis triumphed, then, not because of the depression alone, but because rural people interpreted their difficulties in the categories of nationalist reaction. Modern liberalism had made little ideological or organizational impact upon their traditional way of life and mental outlook. Steeped in conservative, provincial, and anti-marxist prejudices, they chose, particularly in Protestant areas, to blame their economic problems on the deviousness of international bankers, Jews, and Socialists rather then recognizing them as the result of severe structural and cyclical crises and poor harvests caused by bad weather." As a result, both economic hardship and cultural reasons interacted to make farmers one of the key constituencies in the Nazi's electoral success.

The policies we have discussed so far were subsequently implemented following the Nazi's rise to power. The formation of the "Reichsnährstand" (national association of food producers) in 1933 led to a considerable improvement in farmers' revenues via increasing prices and quantities sold (Lovin 1969, p.460).[18] The contribution of Nazi policy to the urban economic recovery is more mixed (Overy 1996; Ritschl 2003; Dimsdale et al. 2006). Public work-programs had a limited impact on the economic recovery (Ritschl 2003), which plausibly had already started before the Nazis took power. Even studies giving some credit to Nazi economic policies for the recovery highlight that this was primarily due to reducing workers real wages (Dimsdale et al. 2006). Similarly, consistent with their policy proposals the Nazis did little to revitalise the formal unemployment insurance system despite the improvement in the economic and fiscal situation which had been close to complete collapse since 1931/32.[19] This left many unemployed relying on the very limited crisis support provided by welfare organisation.

[18]The "Reichsnährstand" had legal authority over everyone in agricultural production and distribution. It interfered via regional marketing associations in agricultural markets via purchasing orders, price controls, and prohibitions. Gross incomes of farmers rose by 39.1% in the period 1932-36 following its formation with the corresponding net income gains for small farms being considerably larger (Lovin 1969, p.460). Another major policy was the "Reichserbhofgesetz" (Hereditary Farm Law), which bound farmers to their land through prohibiting sale of land and foreclosures. It also required farmers to prove their Aryan ancestry.

[19]Nützenadel (2017) provides an extensive work on the "Reichsarbeitsministerium" during the Nazi period highlighting the shift from its bureaucratic functions towards ideological goals of the Nazi party.

# 3 Data & empirical strategy

## 3.1 Data

The goal of this paper is to explore the effect of the exposure to export decline during the Great Depression on economic activity and political extremism. To this end we use data on exports by industry over time, as well as employment by industry and detailed administrative areas before the Great Depression. We also use information on economic and political outcomes in 1928 and 1932 across these areas. This section describes the main data sources. It also discusses the merging of census and trade industry classifications, and the construction of consistent administrative areas over time. Summary statistics are presented in Appendix Table B.1. Further details on the data can be found in Data Appendix C.

We use newly digitized trade data from the German Trade Statistics spanning the period 1928-1932 (Statistisches Reichsamt 1928-1932), containing information on the value and quantity of exports and imports by product and country. We collect information on 2278 and 2344 product categories for the years 1928 and 1932, respectively – the most disaggregate information available in the German trade statistics. We retrieved data at a corresponding level of disaggregation from the United States Department of Commerce (1928-1932) on US imports by product and country of origin.[20] Data from this second source allows us to construct an arguably exogenous measure of the decline in foreign demand for German products using changes in US imports from the UK and France (for a similar strategy see Autor et al. 2013). These trade flows provide a relevant proxy for changes in US demand for German products across industries as the combined industrial structures of the UK and France resemble that of Germany in this period and the three countries faced similar trade costs (see Appendix Figure A.2).

The most comprehensive source of data on population and industrial employment in Germany before the Great Depression is the 1925 Census (see Statistisches Reichsamt 1925). From it we collected information on manufacturing employment across 426 manufacturing industries (3-level). This information is reported for city ("Stadt-") and suburban/rural counties ("Landkreis").[21] In our analysis we merge the two, to obtain 786 counties that are good proxies for local labor markets at the time and also correspond to administrative units constructed from the electoral data.[22] Counties can be aggregated in

[20] The value of trade for German exports to the US for which we collected data from both sources have a nearly perfect linear relationship of 0.93 (in 1928) and 0.94 (in 1932) validating the equivalence of the product categories.

[21] A "Landkreis" either surrounds one or multiple "Stadtkreis" or is simply a completely rural area without any urban population center within it. The separate reporting of the administrative unit"Stadtkreis" is based on at least an urban population of 5,000 inhabitants (Statistisches Reichsamt 1925; ICPSR 2005).

[22] This also helps dealing with frequent administrative boundary changes between "Stadt-" and "Landkreise". We account for remaining administrative boundary changes by also aggregating these administrative units. For this, we use Hubatsch & Klein (1975) and MPIDR (2014).

coarser administrative units: 75 districts ("Regierungsbezirke"), 35 electoral constituencies ("Wahlkreise"), and 30 states (16 "Länder"; 14 "Preußische Provinzen"). We match the trade product categories with census manufacturing industries to obtain 188 consistent manufacturing sectors.[23]

The census data only gives us a snapshot of the economic structure before the start of the crisis. We collect time-varying economic data from three additional sources. The Statistical Yearbook of Germany (see Statistisches Reichsamt 1925-1938) provides us with yearly industry level data on output, number of firms, prices, employment and wages at the national level. The Statistical Yearbook of German Cities (see Deutscher Städtetag 1925-1934) provides yearly data on economic indicators (electricity usage, commuting, tax revenues, unemployment, savings) for cities with a population above 50,000 inhabitants. The Prussian Statistical Yearbook (see Preussisches Statistisches Landesamt 1927-1934) and the Statistical Yearbook of Germany provides data on wholesale food price across cities.[24]

Our dataset is completed by county-level information on votes received by parties in German parliamentary and presidental elections taken from ICPSR (2005) covering all elections between 1920-33. Our main focus is on the change in voting behavior between the last election before the Great Depression (20 May 1928) and the election at its height (31 July 1932).

## 3.2 Empirical approach

### 3.2.1 Direct effect

Our main empirical strategy follows Autor et al. (2013), but focuses on a sudden decline in export demand rather than increasing import penetration.[25] We combine the 1925 census data with the 1928-32 change in German exports to construct a measure of direct exposure to the export shock:

$$\Delta \text{EX}_n = \sum_{i=1}^{I} \frac{L_{n,i,25}}{L_{n,25}} \frac{\Delta EX^{GER}_{i,32-28}}{L_{i,25}} \tag{1}$$

[23]The drop in number of categories is due to the fact that we have aggregated trade and census categories to a level where they uniquely match into one merged industrial sector. We draw in our manual matching on existing crosswalks for the US, and identified the corresponding SIC-codes for categories from the 1941 US Census. For example, we match 41 different **4-level trade** categories of cotton yarn and thread, which are part of the **3-level trade** category *"spun cotton (Gespinste aus Baumwolle)"* from the German trade statistics to the **3-level census** categories *"cotton mill (Baumwollspinnerei)"* and *"cotton twisting (Baumwollzwirnerei, -spulerei, -haspelei)"* both part of the **2-level census** category *"cotton industries (Baumwollindustrie)"* into the merged category *"cotton yarn and thread"*.

[24]Figure 2 highlights the considerable variation in food prices and their evolution across cities. This underlines that regional agricultural markets existed across Germany at the time.

[25]Bonfatti & Brey (2023) show theoretically that Autor et al. (2013)'s empirical strategy is suitable for evaluating shocks in a country's exports as well.

where $\Delta EX^{GER}_{i,32-28}$ is the decline in exports (in 1,000RM) in industry $i$ between 1928 and 1932, $L_{i,25}$, is total employment in that industry in 1925, $L_{n,i,25}$ is the employment in that industry in administrative unit $n$, and $L_{n,25}$ is the total population of $n$. Figure C.2 illustrates the considerable variation in exposure to the export decline across industries.

The meausure $\Delta \text{EX}_n$ thus captures an area's direct exposure to the change in German exports between 1928 and 1932 per person. Average direct exposure to the trade shock across counties amounted to 62RM per person.

Our baseline specification for accessing the direct economic and political impact of the export shock is:

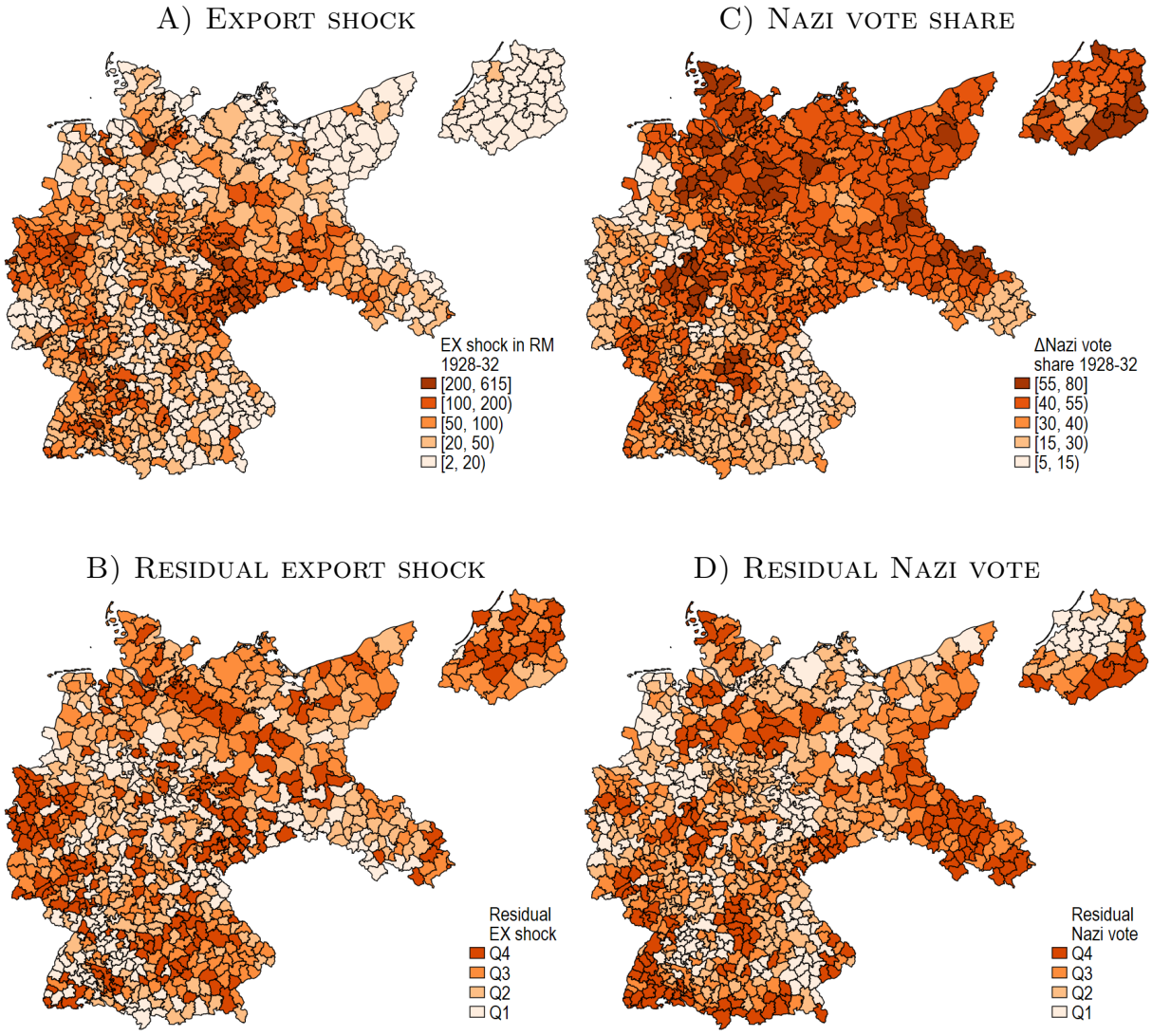
$$\Delta \Lambda_n = \beta \Delta \text{EX}_n + X_n^{'} \delta + I_s + I_c + \epsilon_n \tag{2}$$

where the dependent variable, $\Delta \Lambda_n$ is either a proxy for the change in economic activity or political outcomes between 1928–1932 in geographic unit $n$. Economic activity is measured by (i) electricity consumption, (ii) commuting flows, (iii) tax revenues, (iv) unemployment rates, (v) bank deposits, and (vi) wholesale food prices. This set of outcomes gives us a multifaceted description of the extent of change in economic conditions across geography. Data availability restricts this analysis to cities with more than 50'000 inhabitants. Political outcomes are instead measured by the change in vote shares at the county level for the main political parties in Reichstag elections.

Our main variable of interest is the *direct* export shock $\Delta \text{EX}_n$. $X_n^{'}$ is a vector of initial controls – e.g. observed differences across areas before the Great Depression. In particular we account for the initial employment share in traded manufacturing industries, allowing us to disentangle an area's general specialization in manufacturing from the within industry variation in exposure to changes in export demand. We also control for 1925 urban population, unemployment share, share of Catholics and share of Jewish. Our baseline analysis includes constituency ($I_c$) and state ($I_s$) fixed effects, accounting for – in this long difference specification – constituency and state specific trends. We use robust standard errors for comparison purposes as the unit of observation varies across models and the city/county being our respective unit-of-randomization with only one differenced period of analysis. We present results for specifications using a large variety of alternative clustering strategies (spatial, administrative, and industry-level), which confirm our baseline findings.

Figure 4 illustrates the export shock and the change in vote share for the Nazi party. The top panels present the raw data, whereas the bottom panels illustrate the residualized variation – after we account for the set of baseline controls discussed above. Panel A highlights that the industrial heartlands around the Ruhr Valley and in Saxony were especially affected by the export decline. Once we account for initial characteristics in panel B we can see that exposure to the export shock was considerably more widespread. Furthermore, we can also observe considerable variation in the export shock within both

Figure 4: Mapping main variables 1928-32




Notes: Panel A shows exposure to the change in German exports per person between 1928 and 1932. Panel C shows the change in the Nazi party vote share 1928-32. Panel B and D provide the respective residualized versions of the variables by quartile absorbing differences across counties in 1925 (industrial employment share, urban population, unemployment share, Catholic share, Jewish share).

highly industrialized and less industrialized regions. Figure 4 panel C depicts instead the change in the Nazi vote share between 1928-1932. The larger increase in support for the Nazi party in protestant areas is clearly visible in the North-South divide. Once we account for initial characteristics (panel D), this divide disappears. Overall, the figure suggests that higher exposure to the export shock is associated with a smaller increase in support for the Nazi party.

### 3.2.2 Indirect effect

Section 2 highlights that the export shock might have had an indirect effect on agricultural areas via declining food demand and prices. We can study whether this was a factor in

spreading the economic crisis via the city level wholesale food prices. To evaluate whether this had also political consequences we will build indicators that approximate the indirect effect of the export shock by accounting for the linkages with directly affected counties. We assume that these linkages follow a gravity–like structure of trade within Germany and are shaped by demand and trade costs between areas.

To assess the indirect effects of the export shock we augment our baseline specification of equation 2 as follows:

$$\Delta\Lambda_n = \beta\Delta\text{EX}_n + \gamma\Delta\text{IEX}_n + X_n^{'}\delta + \epsilon_n \tag{3}$$

where $\text{IEX}_n$ is the indirect effect of the export shock across counties. Notably, we do not include any state and constituency fixed effects here as they would absorb the indirect geographic effects we aim to estimate. To capture $\text{IEX}_n$, we use the following gravity-based measure:[26]

$$\Delta\text{IEX}_n = \sum_{\text{-}n}^{\text{-}N} z_{n,\text{-}n}^{D|A}\Delta\text{EX}_{\text{-}n} \tag{4}$$

where $-n$ denotes other counties within Germany with $z_{n,\text{-}n}^{D|A}$ being the weighting matrix of the export shocks $\Delta\text{EX}_{\text{-}n}$. Building on the work of Wolf (2009) we assume that $z_{n,\text{-}n}^{D|A}$ can take one of of two forms to capture different types of internal trade costs: (i) distance and (ii) administrative borders.[27] Under the first scenario $z_{n,\text{-}n}^{D} = \frac{D_{n,\text{-}n}^{\delta} L_{\text{-}n}}{\sum_{\text{-}n}^{\text{-}N} D_{n,\text{-}n}^{\delta} L_{\text{-}n}}$ with $D_{n,\text{-}n}^{\delta}$ being the distance between county $n$ and any other county $-n$ with $\delta$ denoting the trade elasticity.[28] Under the second $z_{n,\text{-}n}^{A} = \frac{A_{n,\text{-}n} L_{\text{-}n}}{\sum_{\text{-}n}^{\text{-}N} A_{n,\text{-}n} L_{\text{-}n}}$ with $A_{n,\text{-}n}$ being a dummy indicating whether any other county $-n$ lies within the same administrative area as county $n$. We use the next higher administrative level (districts) for this.[30] In both measures, $L_{\text{-}n}$ is the population of county $-n$ reflecting differences in demand.

[26] Similar measures have been utilized in recent work by Adao, Arkolakis & Esposito (2019) to evaluate the indirect effect of increased Chinese competition on economic outcomes across US counties.

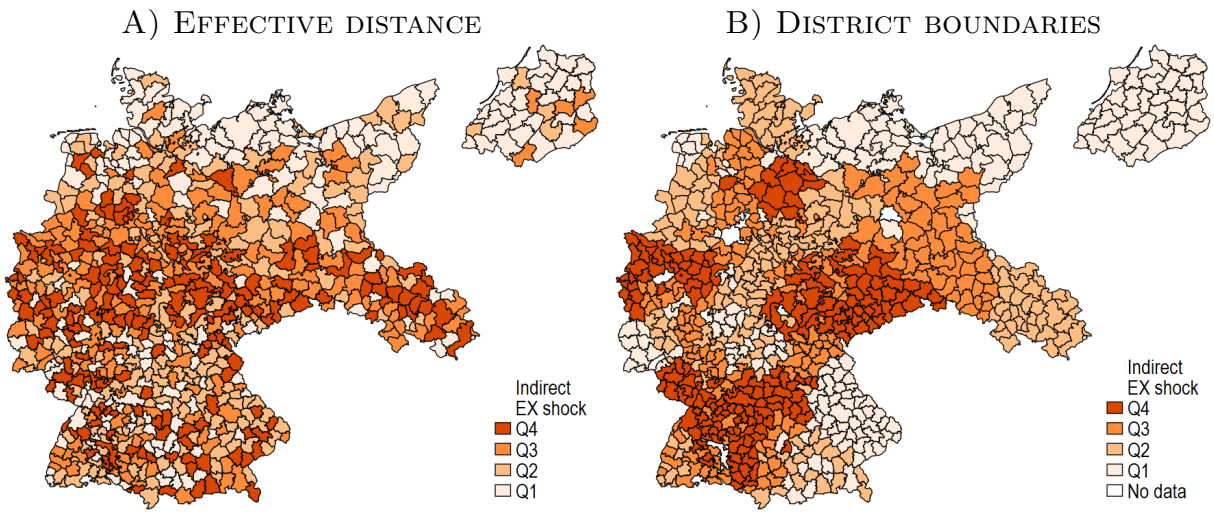
[27] Wolf (2009) documents that both distance and internal administrative borders had a considerable impact on trade flows in Weimar Germany. He estimates the effect of an internal administrative border to be equivalent to a 6.8% ad valorem tariff. The estimates for distance broadly suggest that a doubling of it is equivalent to a 29.6% tariff.

[28] To better capture effective distances for trade in Weimar Germany we take into account the main hubs and arteries of the transport network at the time when constructing $D_{n,\text{-}n}^{\delta}$.[29] In particular, we allow for lower effective distance for connections between counties taking place through the main existing trade corridors. We incorporate this into $z_{n,-n}^{D}$ by assuming for connections taking place along the main existing trade corridors a trade elasticity $\delta = -1.3$ (see Table 2 in Wolf 2009). For other connections (pure geographic distance) we instead assume a trade elasticity $\delta = -5$ (as in Adao, Arkolakis & Esposito 2019). We use for each county-pair whichever $D_{n,-n}^{\delta}$ is lower.

[30] The 75 districts provide a sizable number of administrative units with comparable size and following state borders. We confirm results from this preferred definition using the alternative administrative levels available, namely the 47 sub-divisions of transport districts, 35 constituencies and 18 states. Appendix Figure C.6 provides an illustration of German administrative levels for the county of "Bretten" being part of district "Karlsruhe" as well as the state of "Baden" (equivalent to constituency "32 Baden" and pre-WWI transport district "19").

Figure 5 depicts $\Delta\text{IEX}_n$ across counties using effective distance ($z^D$) and districts ($z^A$). Panel A shows that the former is well spread out geographically, but a large share of the most exposed counties are located along the industrial axis of the Ruhr, Saxony and Silesia. The second measure, illustrated in Panel B, is more geographically clustered and a greater indirect exposure to the export shock can be observed in four distinct areas (i) the Ruhr, (ii) Saxony, (iii) most of South-West Germany and (iv) the Eastern part of the province of Hanover.[31]

FIGURE 5: INDIRECT EXPORT SHOCK ACROSS COUNTIES




Notes: The maps depict our main measures of the indirect export shocks. Panel A shows exposure to the indirect export shock constructed as a gravity measure based on population and effective distance. Panel B shows exposure to the regional export shock constructed based on district administrative boundaries and population. In both cases excluding the district itself. Missing data in Panel B are districts that equal one county.

Finally, we construct alternative measures of $\Delta\text{IEX}_n$ that aim at more specifically reflecting the indirect effect occurring due to changes in urban demand for agricultural products. First, following our gravity weighting method ($z^D$) we construct an alternative $\Delta\text{IEX}_n$ that uses as population weight exclusively urban inhabitants and a uniform distance elasticity ($\delta = -1.3$) as cities should always be well connected. Second, we define agricultural hinterlands specific to cities. In each of those, $\Delta\text{IEX}_n$ is equivalent to the cities direct export shock. This follows the $z^A$ weighting method, where we assume that each county only sells their agricultural products to the closest urban market. We construct these measures for cities above 200'000 inhabitants (28 cities), and 100'000 inhabitants (53 cities) These additional measures are mapped in Appendix Figure A.4.

[31] The two measures of the indirect export shock exhibit a correlation of 0.169.

### 3.2.3 Instrumental variable strategy

A concern for the empirical strategy outlined so far is that changes in German exports might be driven by domestic factors. For example, an increase in local demand would lead us to under-estimate the impact of declining export demand, while a decrease in local productivity would lead us to over-estimate it. The large drop in exports over a short time period suggests that domestic factors are unlikely to play a key role, especially as they would need to be correlated with the export shock at the industry-level to bias our estimates. However, as to the best of our knowledge there is no domestic demand and productivity data available for this period, we cannot rule out entirely this possibility. To address this concern we thus deploy the IV-strategy popularized by Autor et al. (2013) and instrument German exports using trade flows between relevant third countries.

To construct our instrument we use the decline in UK and French exports to the origin of the Great Depression: the US.[32] Identification in our IV-strategy is based on domestic German developments not affecting the pattern of US imports from the UK and France. This is consistent with the argument that the US depression was caused by a domestic shock, while what happened elsewhere in the world can be traced back to that shock (Lewis 1949; Romer 1993). Mitchener et al. (2022) further documents that the cycle of protectionist responses originated from the US's 1930 Smoot-Hawley tariff increase. Importantly, the Smoot-Hawley tariff did not discriminate differently between Germany, France and the UK (country specific reductions were only introduced by the 1934 Reciprocal Tariff Act).[33] Importantly, the drop in US imports of German products is relevant to explain a sizable part of the overall decline in German exports as the US was the third largest export market for Germany by 1928, accounting for 10% of total exports. Changes in exports to the US accounted for an even larger share of the overall decline in German exports due to them experiencing the swiftest and largest decline (Figure A.1.B).

We construct our instrumental variable measuring UK and French exports to the US as follows:

$$\Delta \text{EX}_n^{US} = \sum_{i=1}^{I} \frac{L_{n,i,25}}{L_{n,25}} \frac{\Delta \text{US Imports}_{i,32-28}^{\text{UK|FR}}}{L_{i,25}^{\text{UK|FR}}} \tag{5}$$

where $L_{n,i,25}$, $L_{n,25}$ are again respectively German employment in industry $i$ and county $n$, and total county population providing the initial shares as in Equation 1. This local German employment structure across industries is interacted with the exogenous shifters capturing the decline in US demand for UK and French exports. $\Delta$US Imports$_{i,32-28}^{\text{UK|FR}}$ is

[32] We use the UK and France as they are the two main European trade partners of the US apart from Germany in 1928. The two countries had a level of economic development broadly comparable to Germany at the time and – taken together – a similar export structure. Figure A.2 depicts US imports 1928 in $1000 from Germany compared to from the UK and France.

[33] The drop in imports were further amplified by weight–based US tariffs and price deflation (Harrison 2018) and the more general decline in US economic activity (Figure A.1.A).

the change in US Imports from the UK and France between 1928-32 in industry $i$ in 1,000RM.[34] $L_{i,25}^{\text{UK|FR}}$ is a proxy for industry-level employment in the UK and France.[35]

$\Delta \text{EX}_n^{US}$ gives us the instrumental variable for the direct export shock $EX_n$. For the indirect export shock $\Delta IEX_n$ we weight $\Delta \text{EX}_n^{US}$ instead of $\delta EX_{-n}$ following Equation 4 to construct the corresponding instrument. Figure A.3 illustrates the relationship between the industry employment share (in log scale) and the industry level shock. In particular, in the left panel our industry level shock is represented by changes in German exports per worker, whereas in the right panel it is captured by changes in exports per worker by France and the UK to the US. Manufacturing sectors are depicted in Panel A, 2-level census categories in Panel B, and 3-level trade categories in Panel C. As we can see from Panel A, no individual sector accounts for more than 8.3 percent of initial employment, indicating that the variation in our shock measures is mainly due to differences in the size of the shock per worker.[36] Similar patterns emerge even when we aggregate at the next higher Census and Trade category. The instrument is consistent with these patterns, reflecting a subset of bilateral trade flows more concentrated in some industries, especially fertilizer, and different types of metal smelting and refining. Still it does not appear that these sectors are particularly strong outliers and there is considerable variation in the instrument both across 2-level census and 3-level trade categories, with the most affected sectors producing different types of goods.

Figures A.5.A and A.5.B graphically illustrate the relevance of the first-stage at the industry and county level. They highlight that the decline in British and French exports to the US are a good predictor of the decline in German exports. In addition, Table B.2 shows the correlation of the export shock (panel A) and instrument (panel B) with initial characteristics after controlling for industrial employment share (i.e. we are exploiting only the variation across industries). This allows to evaluate whether the decline in exports is plausibly random and unrelated to initial characteristics or whether some initial characteristics are correlated with the shock. In the later, case these if not controlled for or plausibly other unobserved characteristics might be driving the result estimated for the export shock. Panel A suggests that the 1928-32 export shock was correlated across areas with a lower initial unemployment rate, share of Catholics in the population, lower female and agricultural employment and higher employment in domestic services by 1925. In contrast, panel B provides little evidence that our instrument (change in British and

[34] We adjust the data from US$ to RM using the exchange rate 4.19RM per US$ in 1928 and 4.21RM per US$ in 1932.

[35] Employment data for the UK and France corresponding to our industry classification is unavailable. We proxy it using German industry level employment in 1925 interacted with the ratio of industry-level US imports from the UK and France relative to US imports from Germany in 1928: $L_{i,25}^{\text{UK|FR}} = \frac{\text{US Imports}_{i,28}^{\text{UK|FR}}}{\text{US Imports}_{i,28}^{\text{GER}}} * L_{i,25}$.

[36] More formally, the inverse Herfindahl–Hirshman–Index suggests a reasonable sized effective sample for a shift share analysis, where variation comes from the shifters. For more details, see Borusyak et al. (2022).

French exports to the US) is significantly associated with the 1925 unemployment rate, share of urban population, female, agricultural and domestic services employment and the 1928 support for the Nazi party across areas. We observe that there is an extremely borderline significant correlation of the instrument with a lower Catholic and Jewish share in 1925. To summarise, while one might worry that the non-instrumented export shock might be confounded by initial characteristics of areas if not controlled for, our instrument appears to be orthogonal to any initial characteristics across areas just before the onset of the Great Depression.

# 4 Declining exports and the economic crisis

Table 1 presents the effect of the export shock on different measures of economic activity. All specifications control for employment structure, urban population as well as state fixed effects. Our findings are similar in panel A (OLS) and panel B (IV), so that the discussion below focuses on the IV estimates.[37]

Column 1 shows the effect on electricity consumption per connected individual. This provides a relevant proxy for industrial activity as electricity was the main source of energy in manufacturing by 1925 (Statistisches Reichsamt 1925). The coefficient suggests that for each 1,000RM decline in German exports, electricity consumption declined by 536kWh. Alternatively, the estimates imply that the average exposed city experienced a 15.9% drop in electricity use due to the export shock compared to the 1928 average consumption.[38]

Column 2 studies the effect on commuting, measured as the number of journeys made on public transport per inhabitant. The coefficient suggests that for each 1,000RM drop in exports there were 400 fewer journeys on public transport. This corresponds to a 16.4% drop in the use of public transport for the average city.

Columns 3–5 consider the impact of the export shock on tax revenues. If tax rates are held constant, a decline in tax revenues indicates a decline in the tax base – i.e. a decline in economic activity. Across all three types of tax we consider (i.e. personal income tax in column 3, corporate tax in column 4 and consumption tax in column 5) we uncover a negative effect for the export shock on tax revenues. This implies that personal income, as well as profits declined more in areas more exposed to the shock, and this led to a decline in overall consumption levels. Not only are the estimated effects statistically significant, they are also economically meaningful. For example, our estimates indicate that the

[37] Results presented in Table B.3 are similar without controls (panel A) and additionally controlling for 1925 share of Catholics, share of Jews, and share of unemployed (panel B), but less precisely estimated for some outcomes.

[38] To compute this figure, we take our average exposure to the export shock of 0.06 and multiply it by the coefficient estimate of -536, and divide it by the 1928 average electricity consumption per person of 202kWh.

export shock led to a 9.4% decline in income tax revenues.[39] Note though that these estimated parameters are likely to represent lower bounds to the true decline in economic activity, as the federal government introduced austerity measures during this period that effectively amounted to an increase in the average tax rate (see e.g. Galofré-Vilà et al. 2021).

The export shock led to significant disruptions in the labor market, and in columns 6–8 we evaluate its effect on the unemployment rate 1928-1932.[40] As the traditional unemployment benefits scheme was put under severe strain by the Great Depression (Stachura 1986), new emergency labor market support mechanisms were introduced in the form of "emergency aid" and "community support". We have been able to obtain data on the number of recipients of support under each of these schemes, and we have studied the impact of the export shock on each of them. More precisely in column (6) we focus on the change in the number of recipients of traditional unemployment benefits between 1928-1932. In column (7) the 1932 measure also includes those receiving "emergency aid" (there were none in 1928), whereas in column (8) we also add recipients of "community support". All estimates indicate that the export shock increased the share of unemployed, with the estimated effect for the average exposed city varying between 0.5 and 1.0 percentages points depending on the measure of unemployment we consider.

Column (9) analyzes the effect of the shock on individual finances by looking at deposits in saving accounts, an alternative proxy for economic hardship. It shows whether individuals had to draw on their wealth to get through the crisis. We see that cities more exposed to the trade shock experienced significant declines in overall savings. Finally, column (10) shows that there is no effect on population growth. This rules out spillovers due to internal mobility.

An important question is how much the export shock contributed to the decline in German economic activity during the Great Depression. The baseline decline in the value of German exports between 1928-32 corresponds to 8.3% of 1928 GDP (see footnote 2). As discussed before our estimates from column (1)-(5) suggest that the export shock brought about a decline in economic activity between 9.4-18.0%. This suggests that the export shock plausibly had negative knock-on effects on other sectors within a city.

[39] The calculation for column (4) is 11.4% and for column (5) is 18.0%.

[40] The denominators are 1928 and 1932 city population, respectively, as we do not have any data on labour force participation.

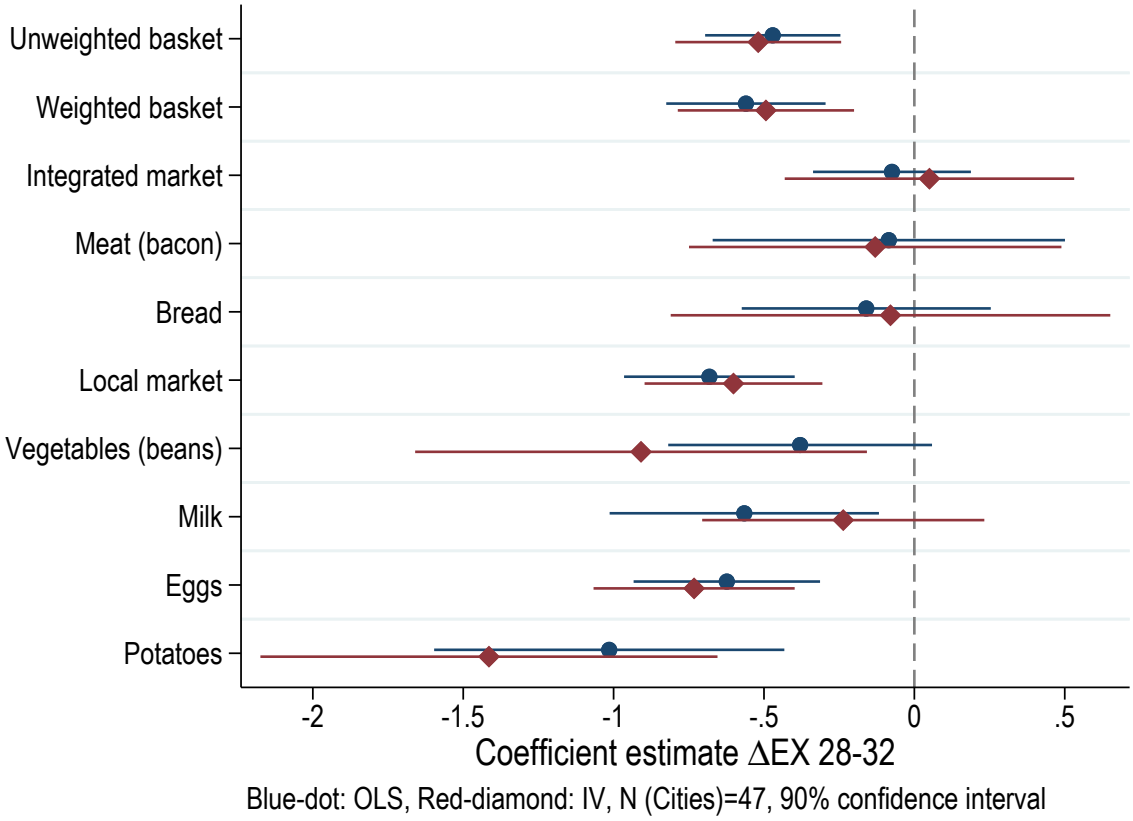
Table 1: City level economic effects

| | Elec-tricity | Public transport | Tax collection | | | Unemployment rate | | | Saving deposits | Pop. growth |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Inc. (N) | Corp. (C) | Cons. (C) | ALU | ALU+KRU | All | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| *Panel A. OLS* | | | | | | | | | | |
| EX 28-32 | -352.547*** | -326.077*** | -36.258*** | -43.182* | -3.934* | 0.067** | 0.161** | 0.275* | -3.931*** | 0.080 |
| | (96.440) | (127.193) | (11.028) | (24.538) | (2.213) | (0.031) | (0.073) | (0.137) | (0.744) | (0.225) |
| | [46.727] | [143.584] | [9.554] | [14.365] | [2.159] | [0.038] | [0.105] | [0.195] | [1.114] | [0.195] |
| Share ind. empl. 1925 | -38.716 | 129.403* | -4.655 | 9.744 | 3.875** | -0.056*** | -0.094*** | -0.107 | 1.075* | 0.285 |
| | (95.566) | (74.494) | (8.106) | (16.261) | (1.643) | (0.021) | (0.035) | (0.064) | (0.605) | (0.211) |
| Inhabitants 1925 | 22.690*** | -6.470 | -0.517 | 1.535 | 0.525*** | 0.001 | 0.004** | 0.006** | 0.022 | -0.001 |
| | (4.360) | (18.067) | (1.744) | (0.973) | (0.134) | (0.001) | (0.001) | (0.002) | (0.033) | (0.018) |
| State FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.328 | 0.176 | 0.436 | 0.557 | 0.555 | 0.319 | 0.307 | 0.323 | 0.235 | 0.103 |
| *Panel B. IV* | | | | | | | | | | |
| $\Delta$ EX 28-32 | -536.184*** | -400.203** | -44.112*** | -37.808*** | -6.400* | 0.079* | 0.172* | 0.166 | -3.319*** | -0.138 |
| | (134.677) | (195.233) | (10.934) | (13.549) | (3.400) | (0.042) | (0.098) | (0.113) | (0.862) | (0.181) |
| | [107.212] | [175.107] | [12.624] | [11.387] | [4.820] | [0.056] | [0.124] | [0.126] | [0.499] | [0.132] |
| F-stat (1st stage) | 52.99 | 63.08 | 43.44 | 43.44 | 35.38 | 41.70 | 41.70 | 41.70 | 43.91 | 41.70 |
| First stage coeff. | 6.468*** | 6.284*** | 6.463*** | 6.463*** | 6.212*** | 6.462*** | 6.462*** | 6.462*** | 6.448*** | 6.463*** |
| | (0.527) | (0.443) | (0.496) | (0.496) | (0.573) | (0.503) | (0.503) | (0.503) | (0.490) | (0.502) |
| $R^2$ | 0.314 | 0.173 | 0.326 | 0.382 | 0.387 | 0.317 | 0.306 | 0.310 | 0.232 | 0.099 |
| $N(cities)$ | 57 | 60 | 72 | 72 | 64 | 75 | 75 | 75 | 69 | 75 |

Notes: Panel A presents the OLS-results for the change in electricity per connected individual, journeys on public transport per person, city tax revenues per person, unemployment rates, growth in saving account deposits, and population growth between 1928 and 1932. Panel B presents the corresponding IV-results results using US imports from France and the UK as instrument. Robust standard errors in parentheses and clustered on state in square brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The Great Depression was characterized by severe deflationary pressures (Temin 1991). This was in part due to government policies and the restrictions imposed by the Gold Standard. But, as emphasized by contemporary observers (e.g. "Karlsruher Zeitung", 27.05.1932) and discussed in Section 2 price declines were especially severe for agricultural products. To study whether agricultural prices were disproportionately affected by a trade induced demand shock, we have collected data for a number of agricultural products in up to 47 German cities during this period. Figure 6 presents the OLS and IV estimates for the effect of the export shock on city-level food prices using the same specification as in Table 1, but using standardized coefficients for comparison.

FIGURE 6: EXPORT SHOCK AND FOOD PRICES




Notes: The figure presents standardized coefficients for the effect of the export shock on food prices at the city-level. Blue dots report OLS estimates, and red diamonds report IV estimates. Estimates are reported for an unweighted food basket comprised of bread, potatoes, fresh vegetables (beans), eggs, milk, and preserved meat (bacon). We construct a corresponding weighted food basket based on expenditure shares from Teuteberg (2006). "Traded" and "Local" is the consumption weighted coefficient for plausibly well-integrated and locally produced goods, respectively. We also report individual results ordered by OLS coefficient size. N=47 for individual food prices, N=45 for food price baskets. 90% confidence intervals using robust standard errors.

We start by analyzing the effect on a food basket including bread, potatoes, fresh vegetables, eggs, milk and meat.[41]. Data from Teuteberg (2006) suggests that these goods cover 93% of food consumption in 1928 Germany (the remaining 7% mainly representing fish, sugar, plant- and animal-fats and tropical fruits). We consider both an "unweighted" basket and one "weighted" using 1928 consumption shares. Our results indicate that cities more exposed to the export shock experienced an overall decline in food prices, indicating that a contraction in local demand might have affected the conditions prevailing in local markets for food. This finding is confirmed when we explore the behavior of the prices of individual goods, with some important distinction. On the one hand, the general pattern we have just uncovered is confirmed when we look at the price of eggs, milk and fresh vegetables – e.g. fragile/perishable goods, difficult to trade over long distances, and potatoes, a produce which due to high transportation costs was typically locally sourced.[42] On the other hand, the export shock had limited or no effect on the price of bread – the market for whose main ingredient (wheat) was well integrated and determined by international prices – or that of meat, another product whose market spanned beyond individual cities.[43]

# 5 Direct political consequences

We turn next to studying the effect of the export shock on political outcomes in Weimar Germany. We start by analyzing the direct consequences of the shock (section 5.1) and we turn next to consider how they vary across different occupational groups (section 5.2).

## 5.1 The direct political impact of declining exports

We start by studying the relationship between the export shock and change in Nazi party vote share across counties in parliamentary elections. Table 2 presents our baseline results with Panel A reporting OLS and Panel B IV estimates. Column (1) reports the results of simple bivariate specifications, highlighting a negative effect of the export shock on support for the Nazi party.[44] In column (2), we additionally control for state and constituency fixed effects to account for differential trends across these different administrative and political units.

[41] We proxy for fresh vegetables using the price of "beans", and for meat using the price of "bacon". We consider "milk" as reflecting the price of downstream products like butter and cheese.

[42] The comparably high transport costs of potatoes is highlighted by Statistisches Reichsamt (1928-1932) showing that potatoes accounted for only 0.8% of German food and beverage imports (even if they accounted for 19% of total food consumption, see Teuteberg 2006). In comparison, raw wheat (excluding flour) accounted for 21% of German food and beverage imports.

[43] The first phenomenon is commonly known as the "grain invasion", while the second was made possible by improvements in refrigeration techniques, see O'Rourke (1997), p.779.

[44] Appendix Figure A.6 visualizes the correlation in a corresponding scatterplot. It also highlights the corresponding relationships across major cities.

It has been argued that industrial workers and the unemployed were less likely to support the Nazi party (e.g. Falter et al. 1985; Falter 1991; Childers 2010). Related to this, the literature has also suggested that Nazi support was smaller in large cities, as most of the party's consensus originated in rural areas (Brustein 1997). Our results in column (3) – where we control for the share of industrial employment in 1925, the unemployment rate and the share of the population living in urban areas – are consistent with these ideas, even if the coefficients of these controls are not always significant. Another important determinant of support for the Nazi party was the religious affiliation of the population (Falter 1991; Childers 2010), for which we account in column (4). Our results highlight that more Catholic areas experienced a smaller increase in Nazi party support, confirming previous results in the literature, whereas the presence of larger Jewish communities did not have a significant effect. Importantly, across the various specifications reported in the Table, the magnitude of the coefficient of the export shock remains stable.

IV estimates in panel B are comparable in magnitude to the OLS estimates. According to our preferred specification in column (4) of Panel B, a one standard deviation (70RM) decline in exports per person led to a 1.8 percentage point decrease in the Nazi vote share. This indicates that the Nazi party actually experienced a *decline* in electoral support in areas more exposed to a drop in demand for German exports.[45]

Next, we turn to explore the impact of the export shock on support for other political parties. Our main findings are presented in Figure 7 panel A, where we plot the coefficient of the export shock from our preferred specification on the change in support for different political forces, starting from the far-right (top) and moving to the far-left (bottom).[46] The last line presents instead the impact of the export shock on turnout. Our results show that in areas which were more affected by the export shock the "Other" parties and the Zentrum gained the votes that were lost by the Nazis. The large size of the coefficient for "Other" parties appears consistent with their announced economic policies, which focused on the needs of white-collar manufacturing workers and were presented as fundamentally different from those of the Nazi party (see Section 2). It is worth noting that the export shock had little overall effect on the electoral support for either the SPD or KPD, the traditional parties of the organized working class. In Appendix Table B.4 we show on the other hand an increase in support for the KPD in counties which were not traditional strongholds for the party.[47] Furthermore, our results indicate that turnout declined in

[45] As shown in Table 1 the export shock caused an increase in unemployment. As a result, our findings are consistent with earlier correlational evidence in the literature (see e.g Falter et al. 1985; Childers 2010, p.185) suggesting that the unemployed did not fully embrace the Nazi party.

[46] We uncover similar patterns in political support when we focus on city–level outcomes (see Appendix Table B.5).

[47] In Appendix Table B.4 we replicate the analysis in Table 2 (see columns (1)-(4)). The results in column (4) show that, once we account for employment structure, areas experiencing a larger export shock did not see an increase in support for the KPD. KPD support appears instead to be driven by the importance of industrial employment at the local level. In columns (5) and (6) we further investigate this question by splitting the sample into KPD strongholds and other counties (as measured by support

Table 2: Effect direct export shock on Nazi vote share

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| *Panel A. OLS* | | | | |
| Δ EX 28-32 | -0.205*** | -0.323*** | -0.218*** | -0.186*** |
| | (0.057) | (0.054) | (0.074) | (0.061) |
| | [0.074] | [0.055] | [0.068] | [0.049] |
| | {0.153} | {0.063} | {0.065} | {0.048} |
| Share ind. empl. 1925 | | | -0.140 | -0.378*** |
| | | | (0.088) | (0.068) |
| Share unemployed 1925 | | | -0.374 | -0.258 |
| | | | (0.284) | (0.171) |
| Urban pop 1925 | | | -0.067*** | -0.086*** |
| | | | (0.022) | (0.019) |
| Share Catholic 1925 | | | | -0.360*** |
| | | | | (0.011) |
| Share Jewish 1925 | | | | -0.213 |
| | | | | (0.528) |
| Constituency FE | No | Yes | Yes | Yes |
| State FE | No | Yes | Yes | Yes |
| $R^2$ | 0.011 | 0.521 | 0.526 | 0.828 |
| *Panel B. IV* | | | | |
| Δ EX 28-32 | -0.184** | -0.378*** | -0.357*** | -0.257** |
| | (0.072) | (0.064) | (0.108) | (0.100) |
| | [0.088] | [0.068] | [0.106] | [0.084] |
| | {0.163} | {0.084} | {0.125} | {0.079} |
| F-stat (1st stage) | 98.13 | 85.20 | 40.03 | 39.97 |
| First stage coeff. | 6.634*** | 6.155*** | 4.076*** | 4.077*** |
| | (0.670) | (0.667) | (0.644) | (0.645) |
| Reduced form coeff. | -1.217** | -2.327*** | -1.455*** | -1.049** |
| | (0.516) | (0.527) | (0.553) | (0.515) |
| $R^2$ | 0.011 | 0.520 | 0.525 | 0.828 |
| $N(counties)$ | 785 | 785 | 785 | 785 |

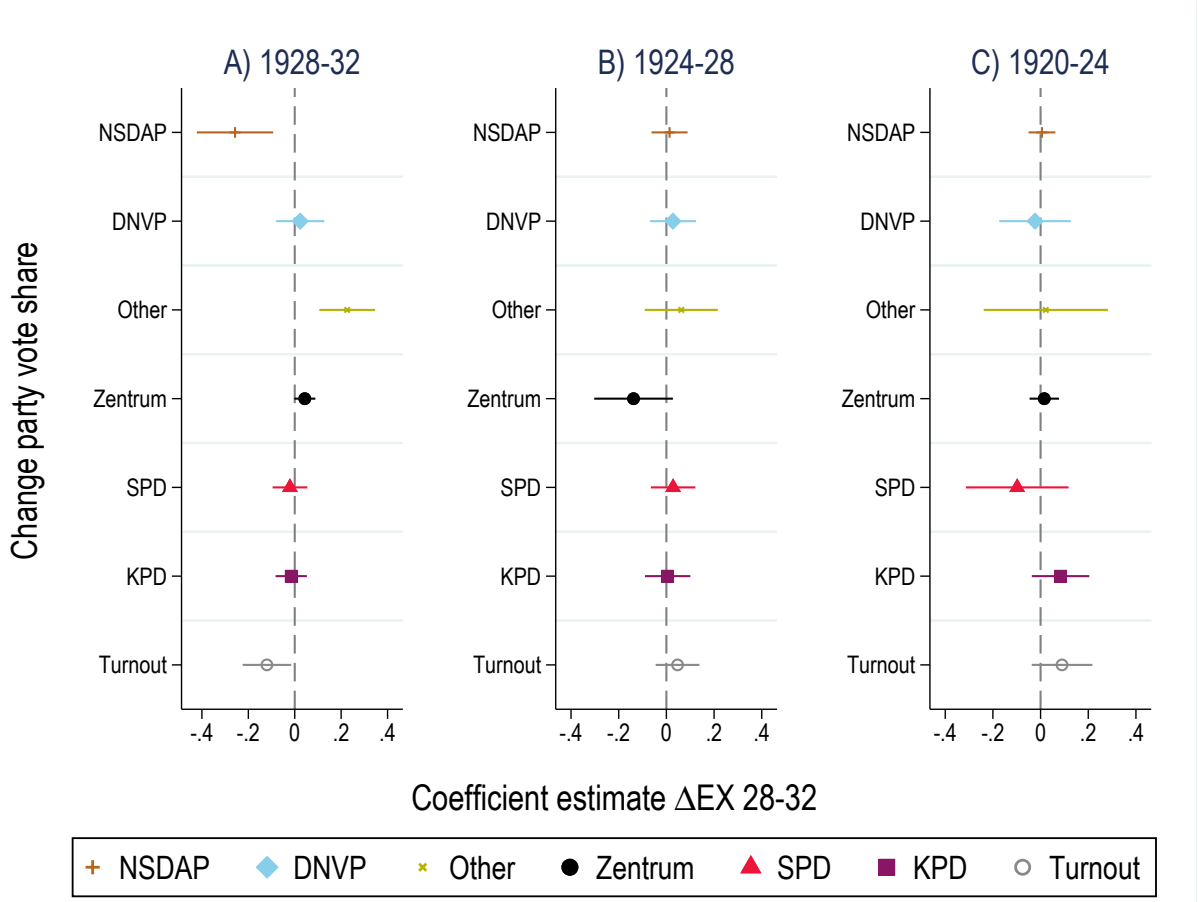
Notes: For all regressions the dependent variable is the change in the Nazi party vote share between the parliamentary elections in May 1928 and June 1932. Panel A presents OLS-estimates. Panel B presents IV-estimates using US imports from France and the UK as instrument. Robust standard errors in round brackets, 25km spatially clustered in square brackets and 100km spatially clustered in curly brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

areas more exposed to the export shock, suggesting that voters might have lost faith in

in pre-crisis Reichstag elections) and we uncover that greater exposure to the export shock led to an increase in support for the KPD in areas in which the party was initially less strong.

the democratic process, even if they did not necessarily increase their support for the Nazis.

FIGURE 7: EFFECT ACROSS PARTIES: IV-ESTIMATES




Notes: The coefficients present IV estimates for the export shock on party vote shares over time. Panel A for the change in vote share May 1928-June 1932. Panel B for the change in vote share May 1924-May 1928. Panel C for the change in vote share June 1920-May 1924. The National Socialist Freedom Movement contested the 1924 election instead of the NSDAP, which was banned for the Beer Hall Putsch. Parties are ordered based on their political orientation from top (far-right/fascist) to bottom (far-left/communist). All specifications the full set of controls corresponding to column 4 of Table 2. 90% confidence intervals using robust standard errors. N=785.

The results we uncover are not due to pre-existing differential trends, as shown in panels B and C of the same figure, where we report the results of regressions of the change in vote share between 1924-28 (panel B) and 1920-24 (panel C) on our 1928-1932 measure of the export shock.[48]

We explore the robustness of our baseline findings along several dimensions. Appendix Table B.7 studies whether our findings are affected by the initial trade openness of a county (based on net exports in 1927), by changes in trade patterns occurring even before 1928,

[48]Data to construct variables for analyzing pre-trends for most economic outcomes is unavailable at the county level, but at least for population (proxied by eligible voters) we do not observe any pre-trends either (see Appendix Table B.6).

or by declining imports between 1928-32.[49] Reassuringly, our main findings are broadly unaffected. Further, we do not find any evidence in Appendix Figure A.8 that the export shock varies in its coefficient size based on initial export orientation of a county by 1927. Results are also similar when clustering standard errors at the district, constituency or state level or weighting by eligible voters (see Appendix Table B.8).

We next evaluate the suitability of our shift-share approach following Borusyak et al. (2022) as identification in our setting comes from exogenous changes in exports (i.e. the shifters).[50] Appendix Table B.9 shows results using a dataset of exposure-weighted "industry-level" aggregates as proposed in Borusyak et al. (2022). A first concern with our identification strategy based on exogenous shifters is that particularly large shocks might be driving our results. To address this, in column (1) we drop outliers. A related issues is that our results might be driven by trends at a more aggregate industry-level and standard errors might be correlated across industries. In columns 2-8 we thus control for aggregate industry-level effects and cluster standard errors at this level following Adao, Kolesár & Morales (2019). Since our dataset has been constructed from German census and international trade data– which provide information at different levels of aggregation – we carry out our analysis separately for both census (columns 2-4) and international trade categories (columns 5-8).[51] The magnitude and significance of our main coefficient of interest is broadly unaffected.

In Appendix Table B.10 we study whether our results are instead driven by individual sectors, by dropping one of them at the time from the analysis. Our findings are broadly robust, but point towards the important role played by the "Chemicals and Pharmaceuticals" sector for our IV estimates, which accounts for a particularly large fraction of the drop in German exports to the US (20.3%).

[49] Our measure of the import decline plausibly reflects declining German domestic demand (Tooze 2007, p.20ff) rather than reductions in foreign competition due to protectionist tariffs. Further, the decline in German exports contributed to the decline in imports as the hard currency earned by the former was needed to pay for the later as well as servicing the sizable foreign currency denominated debt. Appendix Figure A.7 documents that the import decline occurs mostly in a small number of food and intermediate-input industries, while the export decline is more spread out across a larger set of industries and much more prevalent in final products.

[50] Appendix Figure A.3 illustrates that the assumptions of relevant effective sample size and widely dispersed shocks across aggregate categories are met, making our data suitable for a strategy based on exogenous shifters. Manufacturing employment data are already lagged (only available for 1925) and our treatment is a one-period shock, implying that the main concern raised by Borusyak et al. (2022) with regards to the empirical specification in Autor et al. (2013) does not apply in our specification.

[51] Our 187 matched industry categories constructed from the most detailed 3-level German Census and 5-level German Trade Statistics categories are sub-categories of the more aggregate 101 (2-level) and 15 (1-level) German census categories as well as the 166 (4-level), 89 (3-level), 62 (2-level), and 19 (1-level) German Trade Statistics categories.

## 5.2 Mechanism: Unappealing Nazi economic policy

Why did support for the Nazi party not increase in areas more exposed to the export shock? A plausible explanation is that the economic policies proposed by the party might not have appealed to specific sections of the electorate (see also the discussion in Section 2). For instance, for white–collar workers the draconian reduction in unemployment and other benefits proposed by the Nazis and their replacement with manual labor intensive public works under the slogan "work and bread" was likely to amplify economic hardship, rather than providing relief. Furthermore, a growing proportion of white-collar workers was made up by women, often providing a key source of income for struggling households. Working women and their families were unlikely to agree with the Nazi rhetoric about the role of women in society, which discouraged their participation in the labor market, and was instead aimed at relegating them to the home.

Table 3: The effect of the export shock across parties and occupations

| | NSDAP (1) | DNVP (2) | Other (3) | Zentrum (4) | SPD (5) | KPD (6) |
|---|---|---|---|---|---|---|
| $\Delta EX$ Blue collar | 0.533* | -0.048 | -0.586* | 0.109 | 0.166 | -0.174 |
| | (0.313) | (0.202) | (0.303) | (0.131) | (0.143) | (0.123) |
| $\Delta EX$ White collar | -3.423*** | 0.664 | 2.737** | -0.100 | -0.600 | 0.722 |
| | (1.220) | (0.811) | (1.191) | (0.416) | (0.526) | (0.462) |
| $\Delta EX$ Self employed | -0.872 | -0.216 | 1.951** | -0.234 | -0.372 | -0.257 |
| | (1.501) | (0.885) | (0.797) | (0.268) | (0.644) | (0.415) |
| White collar | 0.437* | -0.446** | -0.066 | 0.035 | 0.077 | -0.036 |
| | (0.247) | (0.206) | (0.286) | (0.119) | (0.135) | (0.099) |
| Self employed | 0.262*** | -0.129 | -0.289*** | 0.070 | 0.207*** | -0.121*** |
| | (0.100) | (0.085) | (0.101) | (0.051) | (0.053) | (0.041) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| F-stat (1st stage) | 11.68 | 11.68 | 11.68 | 11.68 | 11.68 | 11.68 |
| $R^2$ | 0.829 | 0.724 | 0.626 | 0.408 | 0.535 | 0.322 |
| $N(counties)$ | 785 | 785 | 785 | 785 | 785 | 785 |

Notes: The table presents the effect of the export shock across different occupational groups on the vote share of main parties between 1928 and 1932. Parties are ordered based on their political orientation with column 1 far-right to column 6 far-left. Column 3-5 are parties that predominantly supported the Weimar republic. All specifications present IV estimates and include the full set of controls corresponding to column 4 of Panel B, Table 2. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We investigate the effect of the export shock on different sub–sections of the electorate in Table 3, where we focus on different occupational groups. In particular, for each county $n$ we construct an occupation $o$ specific shock defined as follows:

$$\Delta \text{EX}_{o,n} = \sum_{i=1}^{I} \frac{L_{o,i,25}}{L_{i,25}} \frac{L_{n,i,25}}{L_{n,25}} \frac{\Delta EX^{GER}_{i,32-28}}{L_{i,25}}$$

where $o$ refers to either blue-collar, white-collar or self employed workers, $\frac{L_{o,i,25}}{L_{i,25}}$ captures the prevalence of $o$ type workers in the total industry employment and the other variables are defined as in equation 1.[52] In line with the idea that the Nazi party policies provided little economic relief to white–collar workers in manufacturing, we observe that counties exposed to a larger white-collar specific export shock experience a larger decline in Nazi vote share. In contrast, counties exposed to a larger blue-collar specific export shock saw an increase in support for the Nazi party – as expected given that the party's proposed policies were more likely to alleviate their economic distress. At the same time, the "Other" parties – who were the main advocates of distinct white-collar benefits – gained support in areas more exposed to the white-collar specific export shock, while experiencing a decline in areas more exposed to the blue-collar specific export shock.

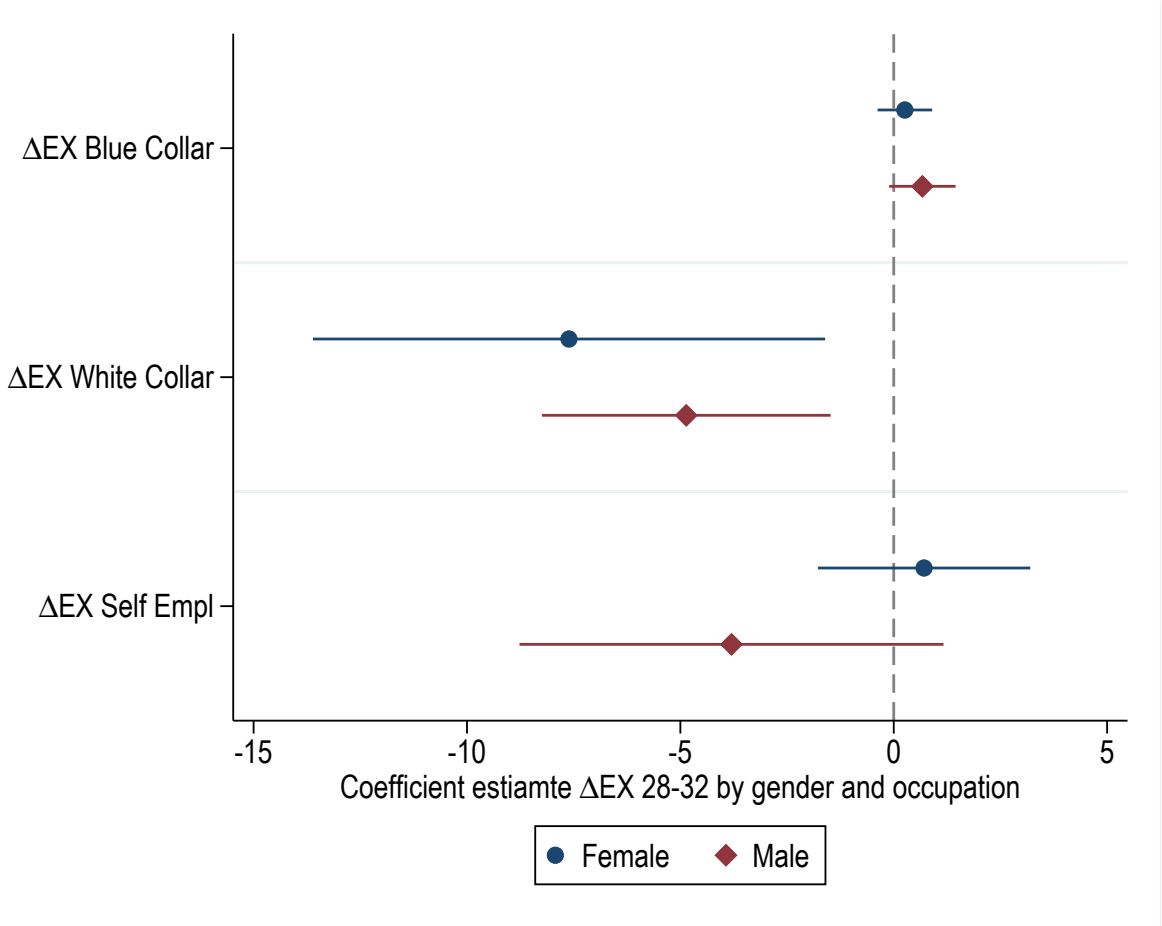
Our results also indicate – in line with previous evidence (e.g Childers 2010) – that the increase in baseline support for the Nazis was greater in counties with larger white-collar employment – compared to the baseline (blue-collar) – and that this was due to a decline in support for the DNVP – a right wing monarchist party, which was popular among already radicalized voters before the Great Depression and for which the effect of the export shock might have played a smaller role. A similar increase in the Nazi vote share can be observed also for areas in which self-employment was more important, but in this case it isless straightforward to point out which voters changed their allegiance.

In Figure 8 we study instead whether the effect of the shock on support for the Nazi party differed depending on both the occupation structure and gender composition of the labor force at the county level. To keep the analysis tractable, we simplify the specification in column (1) of Table 3 by controlling directly for the relevant gender-occupation specific shocks, but grouping the remaining shocks in a residual category. The results indicate that the decline in support for the Nazi party induced by a greater exposure to the export shock is larger in magnitude in counties where female white–collar employment was higher, and that this effect is larger in absolute value compared to the corresponding decline in counties with large male employment in white–collar occupations. This finding is in line with the idea that female white-collar workers perceived the policies proposed by the Nazi party to address the negative consequences of the export shock as particularly detrimental for them. For blue-collar workers the positive effect of the export shock on Nazi support appears instead close to zero for women and mostly due to male blue-collar workers (even if borderline insignificant). Finally, the effect on self-employed workers is insignificant for either gender as is the overall effect for this group.

Appendix Table B.11 reports similar results if we consider presidential elections. Panel A shows that counties more exposed to the export shock exhibited lower support for

[52]Note that the occupation-specific export shocks sum up to the overall export shock in a county, i.e. $\Delta \text{EX}_n = \sum_o \Delta \text{EX}_{o,n}$.

Figure 8: Effect on Nazi vote share by occupation and gender




Notes: IV estimates for EX shock by occupation and gender. Baseline controls plus share of employment by occupation and gender included. Confidence interval 90%. N=785

Hitler,[53] while instead support for Hindenburg increased. In panel B we repeat the analysis by occupational groups and show similar patterns as in Table 3.

# 6 Indirect political consequences

So far our analysis has focused on the direct effect of the export shock on voting across counties. As shown in the literature (Adao, Arkolakis & Esposito 2019), trade shocks are likely to spread across geography. To what extent did this occur in Weimar Germany?

In Table 4 we address this question in two ways, by constructing alternative measures of the "effective" indirect export shock. The first – considered in the specifications reported in columns (1) and (2) – is based on a gravity model and as a result a shock occurring in a surrounding county will be more severe if that county is closer and/or more populated. The second – see columns (3) and (4) – assumes instead that trade is geographically

[53]Note that Hitler was not allowed to run in the 1925 election as he was in prison following the failed Beer Hall putsch.

segmented within administrative areas, so that only shocks occurring within the same district play a role, while their impact still depends on the size of the market affected.[54]

Table 4: Indirect effect of the export shock

| | Gravity | | District | |
|---|---|---|---|---|
| | OLS | IV | OLS | IV |
| | (1) | (2) | (3) | (4) |
| Δ EX 28-32 | -0.166*** | -0.258** | -0.168*** | -0.254*** |
| | (0.055) | (0.100) | (0.056) | (0.096) |
| | [0.054] | [0.103] | [0.058] | [0.101] |
| | {0.054} | {0.089} | {0.083} | {0.055} |
| Δ IEX 28-32 | 0.057 | 0.094** | 0.184** | 0.213*** |
| | (0.035) | (0.046) | (0.072) | (0.082) |
| | [0.036] | [0.045] | [0.099] | [0.105] |
| | {0.036} | {0.053} | {0.091} | {0.157} |
| Controls | Yes | Yes | Yes | Yes |
| Const. & State FE | No | No | No | No |
| F-stat (1st stage) | | 17.22 | | 17.79 |
| $R^2$ | 0.732 | 0.731 | 0.736 | 0.735 |
| $N(counties)$ | 785 | 785 | 774 | 774 |

Notes: The table present the effect of the local and regional export shock. We construct the regional shock based on weigthing all shocks across Germany by population and effective transport distance or administrative (district) boundaries. In the IV specification the local and regional export shock are instrumented with the corresponding US-UK/FR import decline. Robust standard errors in round brackets, 25km spatially clustered in square brackets and 100km spatially clustered in curly brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Our IV results – see columns (2) and (4) – confirm that while support for the Nazi party declines in the presence of a larger direct export shock, a greater *indirect* export shock (ΔIEX) led to an increase in support for Adolf Hitler's political movement.[55] Why did the Nazi party manage to capitalize on the "indirect" hardship brought about by the export shock, whereas it was not successful in exploiting the direct hardship?

We can think of at least two explanations. First, the indirect export shock could be driven by sectoral linkages within manufacturing across geography – but its overall effect could vary because of differences in the occupational structure of upstream sectors across locations. For example, intermediate good producers could be more unskilled labor intensive than final good producers (see Table 3). Alternatively, as pointed out in the literature, the economic policies proposed by the Nazi party to address the economic

[54]See equation 4 in Section 3.2.2 for more details. In all our specifications we control for industrial employment share, urban population, unemployment rate and Catholic and Jewish share in 1925. We do not include constituency and state fixed effects in these models as they could possibly absorb the indirect export shock we aim to capture.

[55]Appendix Table B.12 shows that our findings are robust if we consider alternative definitions of the administrative border (transport district sub-division, constituency, and state).

downturn could have been especially appealing for farmers and agricultural workers (see Section 2.3). As a result, more rural areas and/or areas more specialized in agriculture might exhibit greater support for Adolf Hitler's party.

We assess these alternative arguments in Table 5. In column (1) we allow the impact of the indirect export shock to vary with the share of employment in the manufacturing sector, whereas in column (2) the effect of the shock varies with the share of blue–collar workers. Our results indicate that the increase in support for the Nazi party brought about by the indirect shock does not vary with the importance of manufacturing at the local level, or with the share of blue–collar workers employed. This suggests that sectoral linkages within manufacturing are unlikely to be the key drivers of our findings.[56]

In columns (3) and (4) we explore instead whether the results uncovered in Table 4 are driven by the voting behavior of rural and agricultural voters. To this end we allow the effects of the indirect export shock to vary depending on the rural share of the population in the county (column 3) and on the agricultural share of employment (column 4). Our results indicate that if a county is entirely urban, the sign and magnitude of the indirect shock is not statistically different from that of the direct shock. At the same time, as the county becomes more rural, a greater indirect shock translates in an increase in support for the Nazi party.[57] Qualitatively similar results hold also when we consider heterogeneity along agricultural employment. These findings provide support for the idea that the indirect shock led rural and agricultural voters to increase their support for the Nazi party.[58]

To further assess the role played by agricultural workers and farmers we carry out an additional exercise, in which we focus on the indirect export shock that involves large urban centres, i.e. locations generating a large demand for food and agricultural products farmed in surrounding counties. Our results are reported in Table 6.[59] In columns (1)–(2) we construct our measure of the indirect shock using a gravity approach, where we focus respectively on urban areas with at least 200,000 and and 100,000 inhabitants respectively, and where the shock is weighted by their distance from the county (urban gravity).[60] Our results indicate that the indirect effect of the export shock on support for the Nazi party

[56] This is further confirmed by us not observing that exposure to the indirect export shock is significantly correlated with differences in the occupational structure within manufacturing after including our baseline controls. Coefficient for $\Delta IEX$ on blue-collar employment share within manufacturing in 1925: 0.030(0.029)

[57] The coefficient changes sign when the rural population exceeds 47%.

[58] Appendix Table B.13 provides additional evidence for this mechanism by splitting the sample in rural vs. urban counties using three different thresholds for the definition of an urban jurisdiction. Our results indicate that a larger indirect exports shock increased support for Adolf Hitler's political movement only in rural areas. This result holds both when we consider the gravity based measure and the one based on geographically segmented markets within districts.

[59] An illustration of the magnitudes of the shocks according to these different definitions can be found in Appendix Figure A.4.

[60] As trade with large urban areas should benefit from the availability of good quality infrastructure, we assume a constant elasticity with respect to distance and set it to $\delta = -1.3$.

Table 5: Mechanism for indirect export shock

| | IEX shock interaction effects | | | |
|---|---|---|---|---|
| | Manufacturing-linkages | | Agricultural-linkages | |
| | Manuf. | BC | Rural | Agric. |
| | (1) | (2) | (3) | (4) |
| Δ EX 28-32 | -0.252** | -0.214** | -0.237** | -0.183** |
| | (0.099) | (0.101) | (0.098) | (0.091) |
| Δ IEX 28-32 | 0.194* | 0.209** | -0.234*** | -0.123 |
| | (0.104) | (0.097) | (0.084) | (0.092) |
| × Manufacturing | -0.685 | | | |
| | (0.584) | | | |
| × Blue–collar | | -1.214 | | |
| | | (0.808) | | |
| × Rural | | | 0.493*** | |
| | | | (0.132) | |
| × Agriculture | | | | 0.603** |
| | | | | (0.252) |
| Blue-collar share | | 1.106** | | |
| | | (0.432) | | |
| Agricultural share | | | | 0.181*** |
| | | | | (0.026) |
| Controls | Yes | Yes | Yes | Yes |
| Const. & State FE | No | No | No | No |
| F-stat (1st stage) | 11.44 | 10.96 | 12.17 | 12.30 |
| T-test (EX=IEX) | 0.00 | 0.00 | 0.98 | 0.66 |
| $R^2$ | 0.731 | 0.732 | 0.736 | 0.757 |
| $N(counties)$ | 785 | 785 | 785 | 785 |

Notes: The table presents evidence on whether the mechanism for the indirect export shock is related to linkages within manufacturing (via intermediate inputs) or to agriculture (via food demand). Columns 1–4 presents estimates for the indirect export shock being interacted with the local manufacturing, blue–collar, rural population and agricultural share, respectively. Robust standard errors in parentheses.

is significantly larger when we focus on large urban markets than in the baseline result of Table 4, column (2), when instead our gravity based measure included the whole population (e.g. urban and also rural).

In columns (3)–(5) we pursue an alternative strategy focusing on city hinterlands. In columns (3) and (4) our indirect export shock measure is constructed focusing only on the nearest city with a population larger than 200,000 and 100,000 inhabitants respectively; in column (5) we replace instead the indirect export shock with the drop in food prices that occurred in the closest city with more than 200,000 inhabitants.[61] Our results point in the same direction, highlighting that the positive effect of the indirect shock is driven

[61]Systematic data on food prices are not collected for cities with less than 200,000 inhabitants.

Table 6: Urban demand for agricultural products

| | Urban gravity | | City hinterlands | | Food price |
|---|---|---|---|---|---|
| | 200'000 | 100'000 | 200'000 | 100'000 | 200'000 |
| | (1) | (2) | (3) | (4) | (5) |
| Δ EX 28-32 | -0.259*** | -0.260*** | -0.266*** | -0.273*** | -0.425*** |
| | (0.095) | (0.095) | (0.097) | (0.099) | (0.151) |
| Δ IEX 28-32 | 0.486** | 0.446** | 0.147** | 0.103** | |
| | (0.201) | (0.216) | (0.061) | (0.042) | |
| Food price shock | | | | | 0.048** |
| | | | | | (0.020) |
| Controls | Yes | Yes | Yes | Yes | Yes |
| Const. & State FE | No | No | No | No | No |
| F-stat (1st stage) | 19.71 | 19.79 | 18.51 | 18.63 | 11.59 |
| $R^2$ | 0.727 | 0.729 | 0.727 | 0.731 | 0.658 |
| $N(counties)$ | 785 | 785 | 785 | 785 | 736 |

Notes: The table presents results for defining the indirect export shock based on (i) gravity measure using only urban population in columns 1 and 2 and (ii) a dichotomous definition of city's agricultural hinterlands with the shock being based exclusively on the respective city in columns 3 and 4. For both measures we use varying definitions of cities as having at least 200'000, or 100'000 urban inhabitants. Column 5 presents IV estimates where food prices across cities are instrumented with city-level exposure to the US-UK/FR import change (200'000 inhabitant city hinterland definition used due to limited data availability for smaller cities). Robust standard errors in parentheses.

by what happened in the large urban centres that were the main source of demand for food supplies.[62]

As discussed in Section 2 historians and political scientists have argued that "The Nazis regularly used anti-Semitism to appeal to economic self-interest; they castigated the machinations of Jewish cattle dealers, shopkeepers, and bankers as the source of all economic woes." (Tilton 1975, p.71). Using our data we can formally assess this hypothesis by exploring whether whenever Jewish middlemen were plausibly more common the economic hardship in agricultural areas caused by the indirect export shock had a larger effect on support for the Nazi party. We do so in Table 7. In particular we interact our alternative measures of the indirect export shock (gravity, district and urban gravity respectively) with the share of the population that is Jewish in other counties within the same district, to capture the likelihood to interact with Jewish middlemen. Our results in panel A confirm that areas with a plausibly greater prevalence of Jewish middlemen experienced an increase in support for the Nazi party in the presence of a larger indirect

[62] Appendix Figure A.9 corroborated these findings. Panel A shows that the coefficient of the indirect export shock based on the urban gravity measure remains positive and significant when varying the trade elasticity parameter $\delta$. Panel B shows that the sign and significance of this coefficient is robust also to changes in the city size cutoff, and slightly declining as smaller towns are included. Finally, panel C shows that for rural areas and small towns that plausibly generate little food demand outside their own area, there is no positive effect of the indirect export shock.

Table 7: Indirect export shock and Jewish middlemen

| | Gravity (1) | District (2) | Urban gravity (3) |
|---|---|---|---|
| *Panel A. All counties* | | | |
| Δ EX 28-32 | -0.384** | -0.268*** | -0.271*** |
| | (0.164) | (0.094) | (0.094) |
| Δ IEX 28-32 | 0.789 | 0.080 | 0.221 |
| | (0.521) | (0.094) | (0.216) |
| × Jewish middlemen | 13.394 | 19.917*** | 19.059*** |
| | (12.085) | (5.783) | (3.902) |
| Controls | Yes | Yes | Yes |
| Const. & State FE | No | No | No |
| F-stat (1st stage) | 2.30 | 12.06 | 13.44 |
| $R^2$ | 0.576 | 0.738 | 0.738 |
| $N(counties)$ | 774 | 774 | 774 |
| *Panel B. Agricultural counties (>33% employment agriculture)* | | | |
| Δ IEX 28-32 | -0.006 | 0.967 | 0.012 |
| | (0.125) | (1.260) | (0.339) |
| × Jewish middlemen | 21.952*** | 17.638 | 19.269*** |
| | (6.782) | (17.150) | (4.683) |
| F-stat (1st stage) | 22.36 | 0.48 | 22.72 |
| $R^2$ | 0.783 | 0.613 | 0.784 |
| $N(counties)$ | 544 | 544 | 544 |
| *Panel C. Less agricultural counties (<33% employment agriculture)* | | | |
| Δ IEX 28-32 | 0.201* | 0.791 | 0.316 |
| | (0.113) | (0.510) | (0.235) |
| × Jewish middlemen | 5.763 | -7.714 | 4.849 |
| | (7.715) | (16.878) | (5.322) |
| F-stat (1st stage) | 7.84 | 1.54 | 9.65 |
| $R^2$ | 0.645 | 0.292 | 0.638 |
| $N(counties)$ | 230 | 230 | 230 |

Notes: The table present the effect of the indirect export shock with regards to Jewish population share in the origin of the indirect shock (district-level excluding the county itself). The cutoff for defining agricultural and non-agricultural counties in Panel B and C is having above and below 33% of employment in agriculture, respectively. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

export shock. In panels B and C we split our sample and show that our results are driven by counties for which agriculture was more important.

Table 8 explores a number of alternative mechanisms that have been proposed in the literature to explain the rise of the Nazi party, using column (4) of Table 5 as the

benchmark model. To do so, we use a set of contemporary controls. While the findings can thus not be given a causal interpretation, we can assess whether our main proposed mechanism is robust.

Doerr et al. (2022) have argued that the German banking crisis played a key role in bringing the Nazi party to power. Their analysis focuses on the collapse of the Darmstädter und Nationalbank (DANAT), the first institution to go bankrupt in 1931, showing that local areas served by DANAT branches were more likely to support Hitler's party. In column (1) we study whether accounting for the impact of the banking crises affects our results. To do so, we construct a measure of geographic proximity to a branch of the failed DANAT bank using our gravity approach, but we find no statistically significant effect.[63] Moreover, we also show that this effect does not vary depending on the county's employment share in agriculture. Importantly, controlling for proximity to a DANAT branch does not affect our main results.

Historians have pointed out that the collapse of the welfare state during the Great Depression was another important factor behind the rise of the Nazi party (e.g. Galofré-Vilà et al. 2021). Our setting allows us to explore whether differences in exposure to the contraction of the welfare state at the local level impacted support for Hitler's party. In particular in column (2) we control for the change in benefits per recipient between 1928-1932 using province level data from Statistisches Reichsamt (1925-1938). Our results indicate no significant effect. Once again, our baseline findings are not impacted.

A third possible explanation for the rise of Fascist parties proposed in the literature focuses on the so called "Red Threat" (Acemoglu et al. 2022), which in the case of Germany was represented by the growing electoral success of the Communist party. To capture this possibility in column (3) we use our gravity approach to construct a comprehensive measure of exposure to this threat at the local level. While we find that counties experiencing a larger increase in support for the Communist party in surrounding areas also saw an increase in support for the Nazi party, our baseline results are not affected. Additionally, our results indicate that this effect is concentrated in less agricultural areas, which were less exposed to the political violence occurring in many German cities.

Finally, a long lasting concern for European farmers had been the treat of a "grain invasion" from overseas (O'Rourke 1997; Bräuer & Kersting 2023). In column (4) we assess whether this threat helps explain the success of the Nazi party. We do so by constructing a proxy for the proximity of the county to the main point of entry of foreign agricultural products, e.g. harbors. Our results indicate that (non-agricultural) areas closer to these ports did experience less increase in support for the Nazi party, but this effect does not alter our main findings.

[63] We have also run a specification accounting only for the local (i.e. same county) exposure to DANAT branches, and while our results confirm those in Doerr et al. (2022), our main coefficients of interest are not affected.

Summing up, while the results in Table 8 need to be interpreted with some caution, they provide broad support for the key role played by the agricultural sector in explaining the growth in support for the Nazi party.

Table 8: Alternative mechanisms

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Δ EX 28-32 | -0.186** | -0.186** | -0.125 | -0.195** |
| | (0.092) | (0.092) | (0.090) | (0.091) |
| Δ IEX 28-32 | -0.125 | -0.121 | -0.137 | -0.167* |
| | (0.092) | (0.092) | (0.091) | (0.093) |
| × Agriculture | 0.583** | 0.593** | 0.660*** | 0.661*** |
| | (0.253) | (0.257) | (0.255) | (0.253) |
| Bank collapse | 0.009 | | | |
| | (0.049) | | | |
| × Agriculture | -0.185 | | | |
| | (0.127) | | | |
| Austerity | | 0.049 | | |
| | | (0.077) | | |
| × Agriculture | | -0.108 | | |
| | | (0.188) | | |
| Communist threat | | | 2.607*** | |
| | | | (0.551) | |
| × Agriculture | | | -5.397*** | |
| | | | (1.541) | |
| Distance harbour | | | | 0.019*** |
| | | | | (0.005) |
| × Agriculture | | | | -0.020 |
| | | | | (0.012) |
| Controls | Yes | Yes | Yes | Yes |
| Const. & State FE | No | No | No | No |
| F-stat (1st stage) | 12.25 | 12.30 | 11.97 | 12.44 |
| $R^2$ | 0.759 | 0.757 | 0.766 | 0.761 |
| $N(counties)$ | 780 | 785 | 774 | 785 |

Notes: The table accounts for alternative mechanism highlighted for the rise of the Nazi party. Column 1 accounts for the German banking crisis via a gravity measure for exposure to collapses of Danat branches. Column 2 accounts for austerity measures controlling for province level changes to benefits per recipient. Column 3 accounts for the rise in communist threat in nearby cities using a gravity measure constructed using the change in KPD vote share 1928-32. Column 4 accounts for exposure to foreign agricultural imports by controlling for log distance to the nearest major harbour. Robust standard errors in parentheses.

# 7 Conclusion

In this paper, we have studied the political consequences of de–globalization, focusing on interwar Germany. We have shown that the trade collapse led to significant economic hardship across the country – both in areas directly affected by the export shock and in areas that were instead only indirectly exposed to it.

Our analysis has also shown that de–globalization had important consequences for the electoral fortunes of extreme political forces, but that their proposed economic policies played a key mediating role. While the Nazi party was less successful in luring voters in manufacturing areas directly affected by the shock, it instead gained consensus in rural areas indirectly exposed to it. We have provided evidence that the party's economic policy commitments played an important role in explaining these findings: "work and bread" programs did not appeal to better off white–collar manufacturing workers, and were only able to swing relatively small numbers of blue–collar workers. The Nazi policies of support to the agricultural sector were instead perceived to be a much more effective response to the indirect consequences of de–globalization in rural areas and led to significant electoral gains.

One important lesson we have learned from our analysis is that economic shocks per se don't necessarily lead to an increase in support for radical parties: economic policies to deal with the aftermath of the shock play a key role and understanding how their effects play out across different subgroups of society is of paramount importance. While we learned this message in a historical context, we believe it to be very relevant also for today's policy makers who have/will have to deal with the consequences of the ongoing trade war.

# References


Acemoglu, D., De Feo, G., De Luca, G. & Russo, G. (2022), 'War, socialism, and the rise of fascism: An empirical exploration', *The Quarterly Journal of Economics* **137**(2), 1233–1296.

Adao, R., Arkolakis, C. & Esposito, F. (2019), General equilibrium effects in space: Theory and measurement, Technical report, National Bureau of Economic Research.

Adao, R., Kolesár, M. & Morales, E. (2019), 'Shift-share designs: Theory and inference', *The Quarterly Journal of Economics* **134**(4), 1949–2010.

Albers, T. N. (2019), 'Currency devaluations and beggar-my-neighbour penalties: Evidence from the 1930s', *The Economic History Review* .

Albers, T. N. (2020), 'Currency devaluations and beggar-my-neighbour penalties: evidence from the 1930s', *The Economic History Review* **73**(1), 233–257.

Autor, D., Dorn, D. & Hanson, G. H. (2013), 'The China syndrome: Local labor market effects of import competition in the US', *American Economic Review* **103**(6), 2121–68.

Bhavnani, R. & Jha, S. (2014), 'Forging a Non-Violent Mass Movement: Economic Shocks and Organizational Innovations in India's Struggle for Democracy', *Unpublished manuscript* .

Bonfatti, R. & Brey, B. (2023), 'Trade Disruption, Industrialisation, and the Setting Sun of British Colonial Rule in India', *Journal of the European Economic Association* p. jvad054.

Borusyak, K., Hull, P. & Jaravel, X. (2022), 'Quasi-experimental shift-share research designs', *The Review of Economic Studies* **89**(1), 181–213.

Bracher, K. D. (1978), *Die Auflösung der Weimarer Republik: Eine Studie zum Problem des Machtverfalls in der Demokratie*, Vol. 7216, Athenäum-Verlag.

Bräuer, R. & Kersting, F. (2023), 'Trade shocks, labour markets and migration in the first globalisation', *The Economic Journal* p. uead068.

Brustein, W. (1997), 'The logic of evil. The social origins of the Nazi Party, 1925-1933', *German Politics* **6**, 185–185.

Campante, F. R., Chor, D. & Li, B. (2023), 'The political economy consequences of China's export slowdown', *Journal of the European Economic Association* p. jvad007.

Che, Y., Lu, Y., Pierce, J. R., Schott, P. K. & Tao, Z. (2022), 'Did trade liberalization with China influence US elections?', *Journal of International Economics* **139**, 103652.

Childers, T. (2010), *The Nazi voter: The social foundations of fascism in Germany, 1919-1933*, Univ of North Carolina Press.

Colantone, I. & Stanig, P. (2018*a*), 'Global competition and brexit', *American political science review* **112**(2), 201–218.

Colantone, I. & Stanig, P. (2018*b*), 'The trade origins of economic nationalism: Import competition and voting behavior in Western Europe', *American Journal of Political Science* **62**(4), 936–953.

Crucini, M. J. & Kahn, J. (1996), 'Tariffs and aggregate economic activity: Lessons from the Great Depression', *Journal of Monetary Economics* **38**(3), 427–467.

De Bromhead, A., Eichengreen, B. & O'Rourke, K. H. (2013), 'Political extremism in the 1920s and 1930s: Do German lessons generalize?', *The Journal of Economic History* **73**(2), 371–406.

De Bromhead, A., Fernihough, A., Lampe, M. & O'Rourke, K. H. (2019), 'When britain turned inward: The impact of interwar british protection', *American Economic Review* **109**(2), 325–52.

Deutscher Städtetag (1925-1934), 'Statistisches Jahrbuch deutscher Städte'.

Dimsdale, N. H., Horsewood, N. & Van Riel, A. (2006), 'Unemployment in interwar germany: An analysis of the labor market, 1927–1936', *The Journal of Economic History* **66**(3), 778–808.

Dippel, C., Gold, R., Heblich, S. & Pinto, R. (2022), 'The effect of trade on workers and voters', *The Economic Journal* **132**(641), 199–217.

Doerr, S., Gissler, S., Peydró, J.-L. & Voth, H.-J. (2022), 'Financial crises and political radicalization: How failing banks paved hitler's path to power', *The Journal of Finance* **77**(6), 3339–3372.

Dorn, D., Hanson, G., Majlesi, K. et al. (2020), 'Importing political polarization? the electoral consequences of rising trade exposure', *American Economic Review* **110**(10), 3139–83.

Eichengreen, B. & Irwin, D. A. (2010), 'The slide to protectionism in the Great Depression: Who succumbed and why?', *The Journal of Economic History* **70**(4), 871–897.

Evans, R. J. (2005), *The coming of the Third Reich*, Vol. 1, Penguin.

Evenett, S. J. (2019), 'The Smoot–Hawley fixation: Putting the Sino-US trade war in contemporary and historical perspective', *Journal of International Economic Law* **22**(4), 535–555.

Falter, J. W. (1991), *Hitlers Wähler*, Beck München.

Falter, J. W., Falter, J. W., Lindenberger, T. & Schumann, S. (1986), *Wahlen und Abstimmungen in der Weimarer Republik: Materialien zum Wahlverhalten, 1919-1933*, Beck.

Falter, J. W., Lohmöller, J.-B., Link, A. & de Rijke, J. (1985), 'Hat Arbeitslosigkeit tatsächlich den Aufstieg des Nationalsozialismus bewirkt? Eine Überprüfung der Analyse von Frey und Weck', *Jahrbücher für Nationalökonomie und Statistik* **200**(2), 121–136.

Ferguson, T. & Voth, H.-J. (2008), 'Betting on Hitler: The value of political connections in Nazi Germany', *The Quarterly Journal of Economics* **123**(1), 101–137.

Galofré-Vilà, G., Meissner, C. M., McKee, M. & Stuckler, D. (2021), 'Austerity and the Rise of the Nazi Party', *The Journal of Economic History* pp. 1–33.

Grosfeld, I., Sakalli, S. O. & Zhuravskaya, E. (2020), 'Middleman minorities and ethnic violence: anti-jewish pogroms in the russian empire', *The Review of Economic Studies* **87**(1), 289–342.

Guriev, S. & Papaioannou, E. (2022), 'The political economy of populism', *Journal of Economic Literature* **60**, 753–832.

Harrison, J. M. (2018), Trade frictions and micro-price behaviors: Historical applications from the United States, PhD thesis.

Hubatsch, W. & Klein, T. (1975), *Grundriss zur deutschen Verwaltungsgeschichte 1815-1945*.

ICPSR (2005), 'German Weimar Republic Data, 1919-1933'.

Jha, S. (2013), 'Trade, institutions, and ethnic tolerance: Evidence from South Asia', *American political Science review* **107**(4), 806–832.

King, G., Rosen, O., Tanner, M. & Wagner, A. F. (2008), 'Ordinary economic voting behavior in the extraordinary election of Adolf Hitler', *The Journal of Economic History* **68**(4), 951–996.

Lewis, W. A. (1949), *Economic Survey, 1919-1939*, London: George Allen and Unwin.

Lovin, C. R. (1969), 'Agricultural reorganization in the Third Reich: The Reich Food Corporation (Reichsnährstand), 1933-1936', *Agricultural History* pp. 447–462.

Mattoo, A. & Staiger, R. W. (2020), 'Trade wars: What do they mean? Why are they happening now? What are the costs?', *Economic Policy* **35**(103), 561–584.

Mitchener, K. J., O'Rourke, K. H. & Wandschneider, K. (2022), 'The Smoot-Hawley Trade War', *The Economic Journal* **132**(647), 2500–2533.

MPIDR (2014), 'Population history gis collection'.

mr-Kathographie (1914), *Railway network 1914:First order railroads*, mr-Kathographie Gotha.

NSDAP (1932), *Wirtschaftliches Sofortprogramm der NSDAP*, Eher Verlag, Munich.

Nützenadel, A. (2017), *Das Reichsarbeitsministerium im Nationalsozialismus: Verwaltung–Politik–Verbrechen*, Wallstein Verlag.

O'Rourke, K. H. (1997), 'The european grain invasion, 1870–1913', *The Journal of Economic History* **57**(4), 775–801.

Overy, R. J. (1996), *The Nazi economic recovery 1932-1938*, number 27, Cambridge University Press.

Palmer, C. (2018), Reichsfinanzreform (Weimarer Republik), *in* 'Historisches Lexikon Bayerns'.

Preussisches Statistisches Landesamt (1927-1934), *Statistisches Jahrbuch für den Freistaat Preussen*, Verlag des Preussischen Statistischen Landesamt.

Rath, N. (2009), 'Rezessionen in historischer betrachtung', *Wirtschaft und Statistik* (3), 203.

Ritschl, A. (2003), 'Hat das Dritte Reich wirklich eine ordentliche Beschäftigungspolitik betrieben?', *Jahrbuch für Wirtschaftsgeschichte/Economic History Yearbook* **44**(1), 125–140.

Romer, C. D. (1993), 'The nation in depression', *Journal of Economic Perspectives* **7**(2), 19–39.

Spenkuch, J. L. & Tillmann, P. (2018), 'Elite influence? Religion and the electoral success of the Nazis', *American Journal of Political Science* **62**(1), 19–36.

Spoerer, M. & Streb, J. (2013), 'Guns and butter–but no margarine: The impact of nazi economic policies on german food consumption, 1933–38', *Jahrbuch für Wirtschaftsgeschichte/Economic History Yearbook* **54**(1), 75–88.

Stachura, P. D. (1986), *Unemployment and the Great Depression in Weimar Germany*, Springer.

Statistisches Reichsamt (1925), *Gewerbliche Betriebszählung*, Verlag Reimar Hobbing, Berlin.

Statistisches Reichsamt (1925-1938), *Statistisches Jahrbuch für das Deutsche Reich*, Reimar Hobbing, Berlin.

Statistisches Reichsamt (1928-1932), *Monatliche Nachweise über den auswärtigen Handel Deutschlands*, Verlag Reimar Hobbing, Berlin.

Stögbauer, C. (2001), '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**(2), 251–280.

Temin, P. (1991), *Lessons from the Great Depression*, MIT Press.

Teuteberg, H.-J. (2006), 'The consumption of food supplies in germany (per head per year) since the beginning of the industrialisation, from 1850 until 1975', GESIS Data Archive, Cologne. ZA8252 Data file Version 1.0.0, https://doi.org/10.4232/1.8252.

Tilton, T. A. (1975), *Nazism, Neo-Nazism, and the Peasantry*, number 31, Bloomington: Indiana University Press.

Tooze, A. (2007), *The Wages of Destruction: The Making and Breaking of the Nazi Economy*, Penguin UK.

United States Department of Commerce (1928-1932), *The foreign commerce and navigation of the United States*, Goverment Printing Office, Washington.

US Office of Strategic Services (1942), *Germany, main movements of freight traffic, 1942*, United States Office of Strategic Services. Geography Division.

Voigtländer, N. & Voth, H.-J. (2014), Highway to Hitler, Technical report, National Bureau of Economic Research.

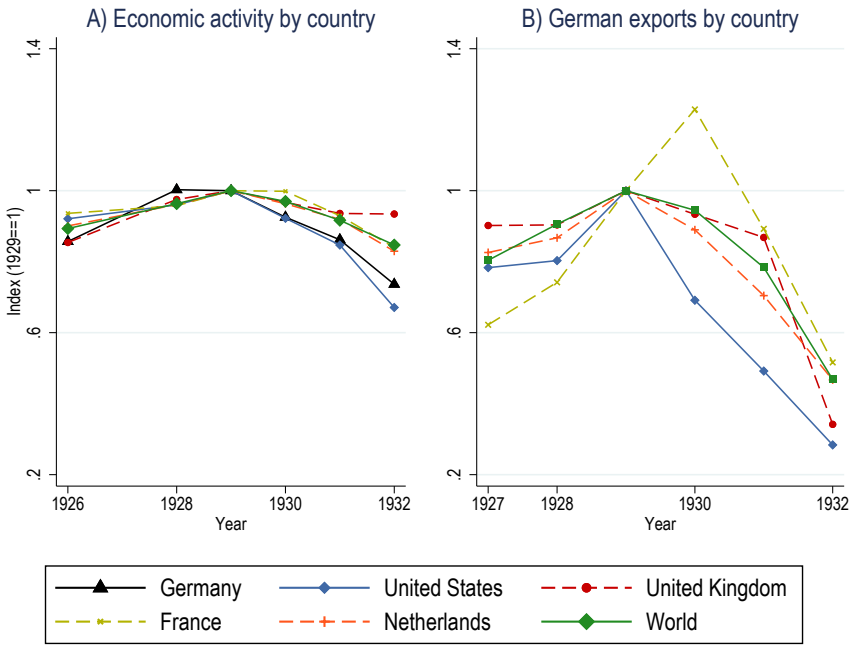
Weck, H. & Frey, B. S. (1981), 'Hat Arbeitslosigkeit den Aufstieg des Nationalsozialismus bewirkt?', *Jahrbücher für Nationalökonomie und Statistik* **196**(1), 1–32.

Wissenschaftliche Dienste (2016), *Kaufkraftvergleiche historischer Geldbeträge*, Deutscher Bundestag.

Wolf, N. (2009), 'Was Germany ever united? Evidence from intra-and international trade, 1885-1933', *The Journal of Economic History* pp. 846–881.

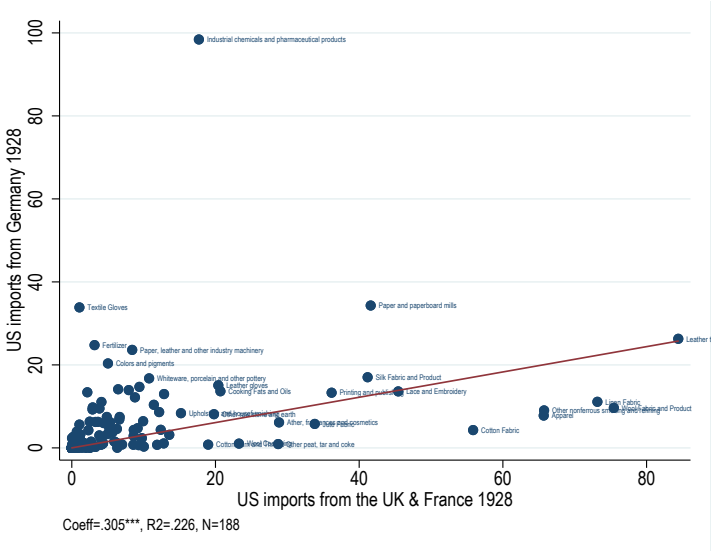
# A Additional Figures

FIGURE A.1: ECONOMIC ACTIVITY AND GERMAN EXPORTS ACROSS COUNTRIES




Notes: The left figure depicts economic activity across countries in June of the respective year relative to 1929. The right figure depicts German exports to the respective country based on total exports per year. "World" being average economic activity across 28 countries for which data is available and total German exports, respectively. Countries included based on 4 main German export destinations in 1928. Source: Albers 2020 (left); Statistisches Reichsamt 1928-1932 (right)

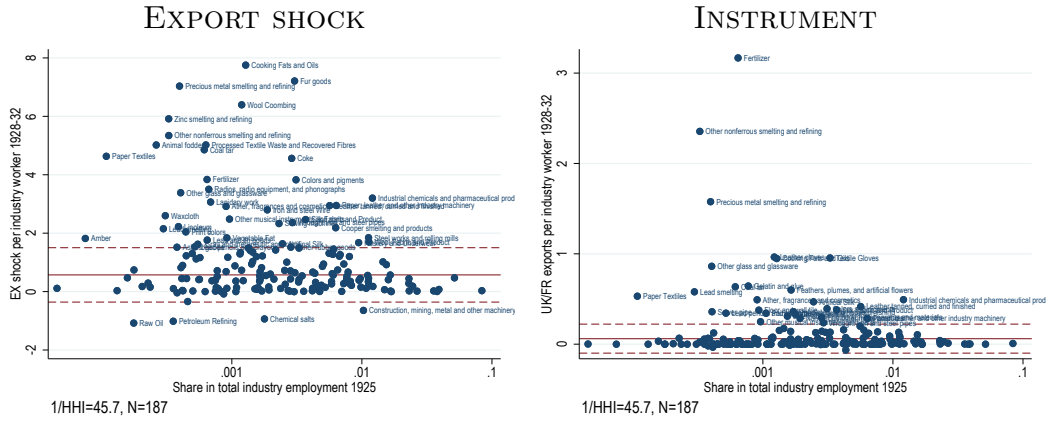
FIGURE A.2: CORRELATION CHANGE US IMPORTS BY COUNTRY



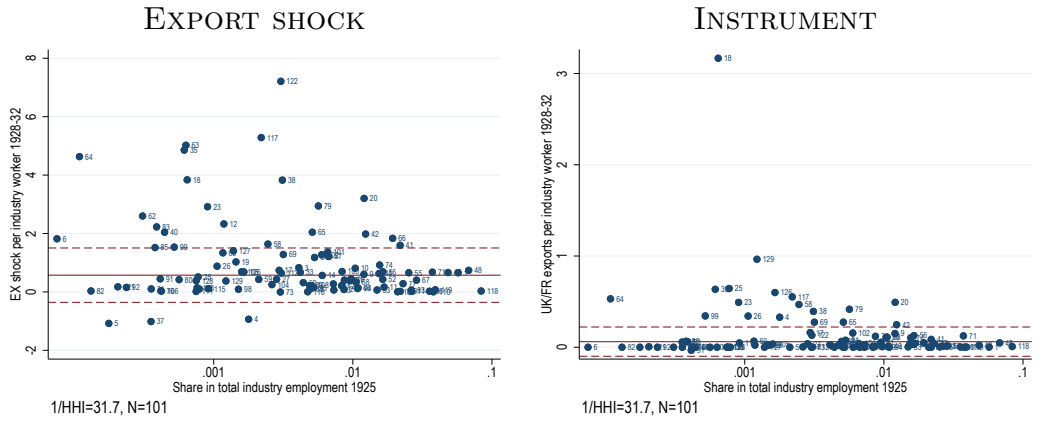

Notes: The figures depicts the correlation in US imports 1928 in $1000 by exporter. The x-axis depicts US imports from UK/France and the y-axis from Germany. Red solid line represent the linear fit.

## Figure A.3: Visualization shifters and shares

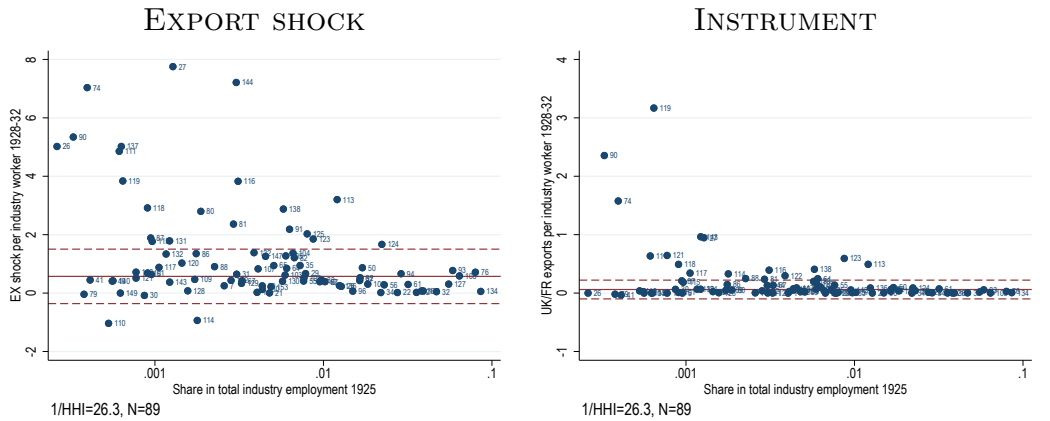
### A) Merged manufacturing sectors




### B) 2-level census categories

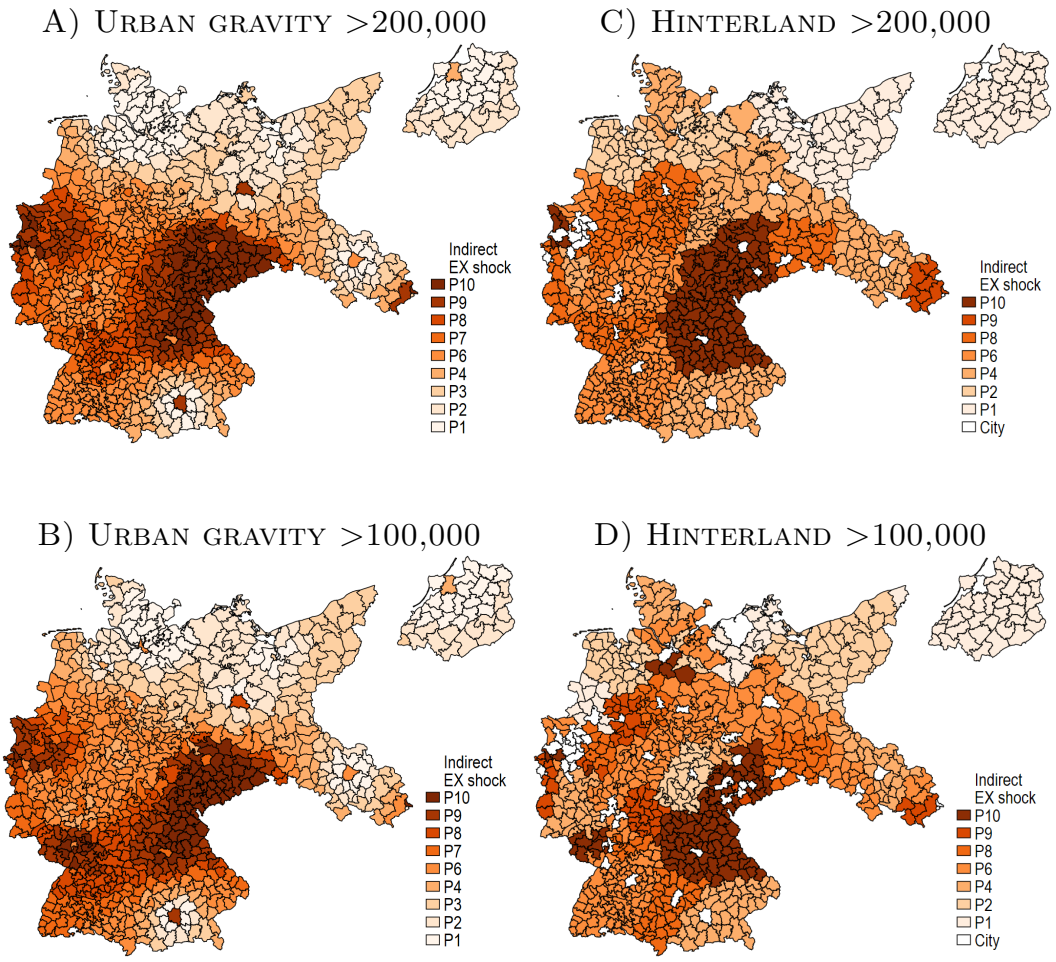



### C) 3-level trade categories



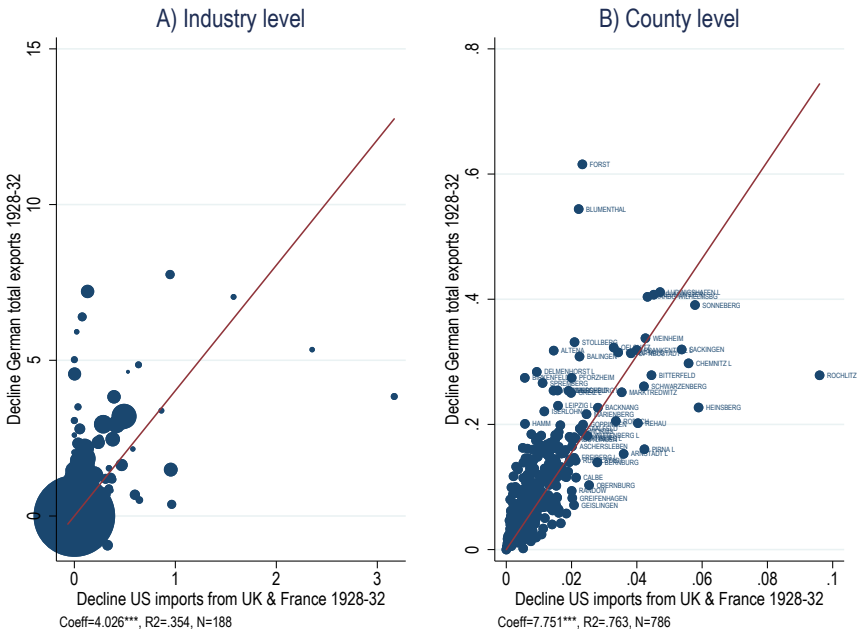

Notes: The figure illustrates the variation of the industry shares and shifters: German exports 1928-32 (left column) and UK/FR exports to US 1928-32 (right column). Panel A reports merged industry categories, Panel B 2-level Census categories, and Panel C 3-level trade categories. The numeral identifier are ordered based on more aggregate categories as in the respective data sources. The x-axis depicts the share of the industrial categories employment in total industry employment in 1925 and the y-axis the respective shock per worker 1928-32. Three largest categories by employment are Apparel (.083), Hard coal (.052), Footwear (.039). The weighted shock mean and standard deviation are depicted by the solid red and dashed lines. Number of industry categories and inverse Herfindahl-Hirschman-Index (HHI) reported at the bottom of each figure.

FIGURE A.4: URBAN-DEMAND INDIRECT EXPORT SHOCKS



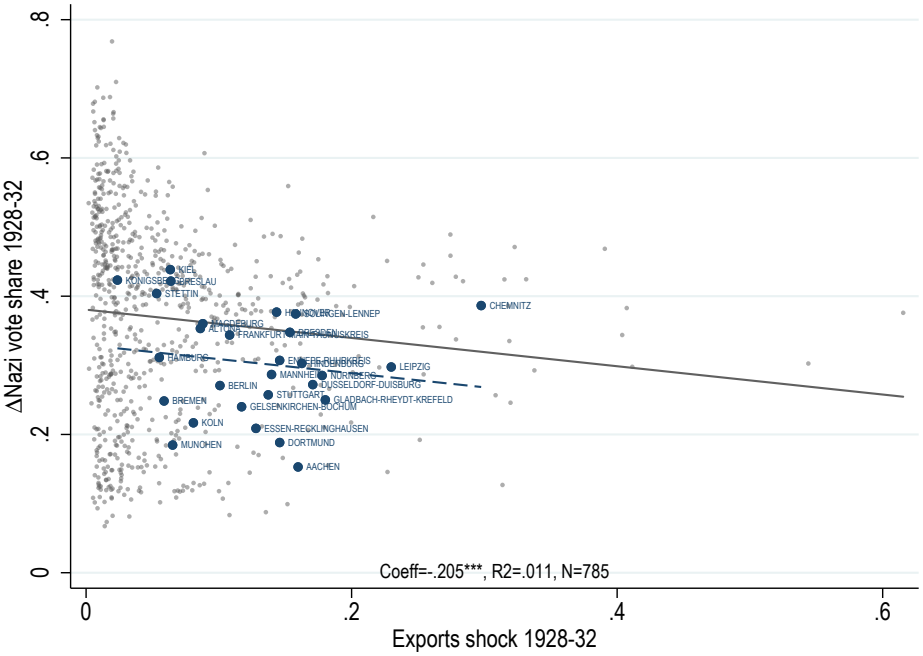

Notes: The maps depict alternative measure of regional export exposure focused on capturing urban demand shocks. We construct these variables based on defining cities as at least having an urban population of 200,000, and 100,000 inhabitants. Panel A–B shows exposure to the regional export shock constructed as a gravity measure based on urban population only using the uniform elasticity $\delta = -1.3$ (see Wolf 2009). Direct export shocks to cities are excluded from their own indirect exposure. Panel C–D shows exposure to the regional export shock constructed based on dividing Germany into agricultural markets based on the closest city. Cities above the threshold are reported in white.

## Figure A.5: First stage



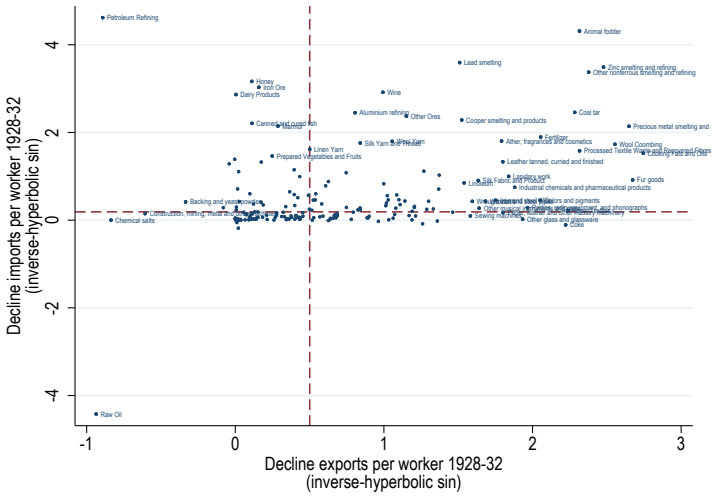

Notes: The figures depicts the change in US imports from the UK and France and German total exports per worker 1928-32. The left (right) scatter-plot presents the relationship at the industry (county) level. The circle size represents employment size of an industry in 1925.

## Figure A.6: Export shock and change in Nazi vote share 1928–32



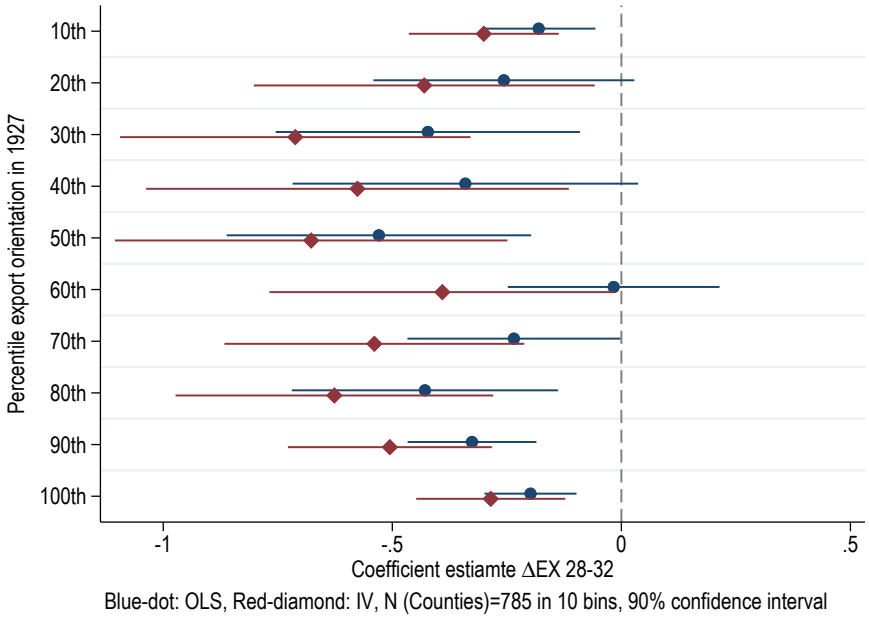

Notes: The figures depicts the correlation between the export shock and the change in Nazi vote share 1928-32 across counties. Main cities with a population of more than 200'000 inhabitants are highlighted and labelled. The grey solid line presents the linear fit for the full sample of counties, while the blue dashed line presents the linear fit for the main cities only.

FIGURE A.7: RELATIONSHIP OF CHANGE IN GERMAN EXPORTS WITH IMPORTS 1928-32



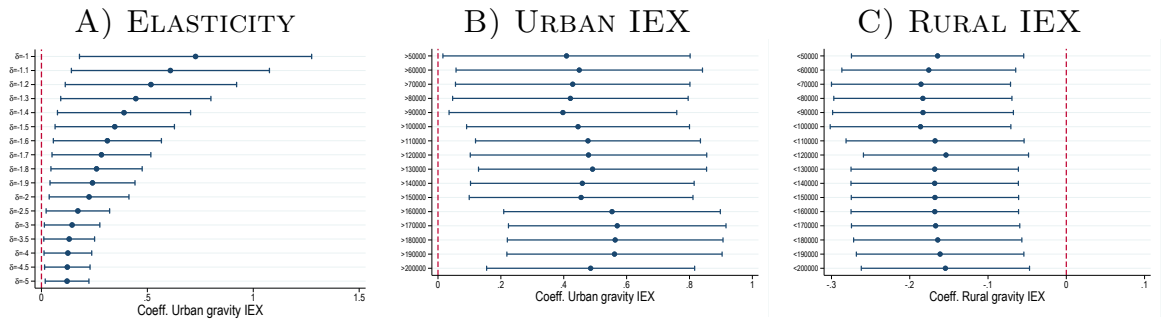

Notes: The figures depicts the correlation between the decline in exports and imports per worker 1928-32. Both variables adjusted by inverse hyperbolic sin for readability. Red-dashed lines represent respective median value.

FIGURE A.8: EXPORT SHOCK BY PERCENTILE EXPORT ORIENTATION IN 1927




Notes: The figure presents the coefficient for the export shock on Nazi vote share by percentiles (10 bins) of initial export orientation. Blue dots report OLS estimates, and red diamonds report IV estimates. 90% confidence intervals using robust standard errors.

## Figure A.9: Variations trade elasticity and population cutoffs




Notes: The figure presents variations to the key parameters for the indirect export shock: the distance elasticity and the population cutoff for urban gravity. Panel A shows results for varying the trade elasticity $\delta$ between -1 to -5 for the indirect export shock using urban gravity (100'000 population cutoff). Panel B shows variations to the population cutoff from at least 50'000 to 200'000 city inhabitants (using the lower trade elasticity to main cities: $\delta = -1.3$). Panel C presents the reverse showing the effect when using rural and small town populations only for constructing the gravity measure (using the higher trade elasticity outside of main cities: $\delta = -5$). 90% confidence intervals using robust standard errors.

# B Additional Tables

Table B.1: Summary statistics

| | Mean | Std. dev. | 25th Perc. | 75th Perc. | Valid obs. |
|---|---|---|---|---|---|
| *Panel A. City-level variables* | | | | | |
| Δ Electricity 28-32 | -19.98 | 45.76 | -41.17 | 3.60 | 65 |
| Δ Transport 28-32 | -55.16 | 40.63 | -79.96 | -19.33 | 70 |
| Δ Income tax 28-32 | -17.78 | 4.81 | -21.01 | -14.64 | 82 |
| Δ Corporation tax 28-32 | -9.85 | 8.24 | -14.86 | -4.37 | 82 |
| Δ Consumption tax 28-32 | 1.80 | 0.90 | 1.25 | 2.38 | 73 |
| Δ ALU unemployment 28-32 | -0.01 | 0.01 | -0.02 | -0.01 | 85 |
| Δ ALU+KRU unempl. 28-32 | -0.02 | 0.02 | -0.03 | -0.01 | 85 |
| Δ Total unemployment 28-32 | 0.02 | 0.03 | -0.00 | 0.03 | 85 |
| Δ Deposits 28-32 | -0.30 | 0.33 | -0.53 | -0.09 | 78 |
| Δ Population 28-32 | 0.06 | 0.09 | 0.02 | 0.06 | 85 |
| Δ EX 28-32 | 0.06 | 0.05 | 0.03 | 0.08 | 89 |
| Share ind. empl. 1925 | 0.19 | 0.08 | 0.13 | 0.23 | 89 |
| Inhabitants (million) 1925 | 0.22 | 0.45 | 0.07 | 0.23 | 89 |
| *Panel B. County-level variables* | | | | | |
| Δ NSDAP 28-32 | 0.37 | 0.14 | 0.26 | 0.47 | 785 |
| Δ DNVP 28-32 | -0.09 | 0.11 | -0.14 | -0.01 | 785 |
| Δ Other 28-32 | -0.24 | 0.11 | -0.30 | -0.16 | 785 |
| Δ Zentrum 28-32 | 0.00 | 0.04 | -0.01 | 0.01 | 785 |
| Δ SPD 28-32 | -0.08 | 0.05 | -0.10 | -0.04 | 785 |
| Δ KPD 28-32 | 0.04 | 0.03 | 0.02 | 0.05 | 785 |
| Δ Vote share 28-32 | 0.09 | 0.07 | 0.05 | 0.12 | 785 |
| Δ EX 28-32 | 0.06 | 0.07 | 0.02 | 0.08 | 785 |
| Δ UK&FR EX to US 1928-32 | 0.01 | 0.01 | 0.00 | 0.01 | 785 |
| Δ IEX (Gravity) | 0.07 | 0.07 | 0.02 | 0.09 | 785 |
| Δ IEX (District) | 0.07 | 0.04 | 0.04 | 0.10 | 774 |
| Δ IEX (Urban Gravity) | 0.11 | 0.07 | 0.06 | 0.15 | 785 |
| Δ IEX (City) | 0.12 | 0.06 | 0.06 | 0.15 | 785 |
| Share ind. empl. 1925 | 0.12 | 0.08 | 0.07 | 0.16 | 785 |
| Inhabitants (million) 1925 | 0.08 | 0.18 | 0.03 | 0.07 | 785 |
| Share unemployed 1925 | 0.06 | 0.02 | 0.05 | 0.07 | 785 |
| Share Catholic 1925 | 0.37 | 0.38 | 0.03 | 0.82 | 785 |
| Share Jewish 1925 | 0.00 | 0.01 | 0.00 | 0.01 | 785 |

Notes: Summary statistics for the main variables used. Panel A presents the variables for the economic analysis at the city level. Panel B presents the variables for the political analysis at the county level.

Table B.2: Correlation change exports 1928-32 with 1925 county characteristics

| *Panel A. German exports 1928-32* | | *Panel B. UK/FR exports to US 1928-32* | |
|---|---|---|---|
| % Unemployed 1925 | -0.002** | % Unemployed 1925 | -0.000 |
| | (0.001) | | (0.001) |
| Urban 1925 | 0.011 | Urban 1925 | -0.008 |
| | (0.007) | | (0.007) |
| % Catholic 1925 | -0.026* | % Catholic 1925 | -0.031* |
| | (0.015) | | (0.017) |
| % Jewish 1925 | -0.000 | % Jewish 1925 | -0.000* |
| | (0.000) | | (0.000) |
| % Female empl. 1925 | -0.008* | % Female empl. 1925 | 0.004 |
| | (0.005) | | (0.005) |
| % Agriculture 1925 | -0.021*** | % Agriculture 1925 | -0.006 |
| | (0.005) | | (0.005) |
| % Domestic serv. 1925 | 0.001** | % Domestic serv. 1925 | -0.000 |
| | (0.000) | | (0.000) |
| % NSDAP 1928 | -0.003 | % NSDAP 1928 | 0.001 |
| | (0.002) | | (0.002) |
| $N(counties)$ | 785 | $N(counties)$ | 785 |

Notes: Correlation between change in German exports per person 1928-32 (panel A) and our instrument for it (panel B) with initial characteristics controlling for 1925 industrial employment share. Coefficient size adjusted to represent a one standard deviation change in German exports and UK|FR exports to the US.

Table B.3: City level economic effect of instrumented export shock - Different controls for Table 1 Panel B

| | Elec-tricity | Public transport | Tax collection Inc. (N) | Corp. (C) | Cons. (C) | Unemployment rate ALU | ALU+KRU | All | Saving deposits | Pop. growth |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| *Panel A. No controls* | | | | | | | | | | |
| Δ EX 28-32 | -349.268*** | -208.465** | -31.982*** | 32.790 | -2.812 | 0.053** | 0.126** | 0.212* | -2.070** | -0.103 |
| | (93.026) | (84.054) | (9.216) | (35.684) | (3.731) | (0.026) | (0.064) | (0.123) | (0.819) | (0.164) |
| Controls | No | No | No | No | No | No | No | No | No | No |
| *Panel B. Additional controls: Catholic, Jewish and unemployment share 1925* | | | | | | | | | | |
| Δ EX 28-32 | -529.263*** | -315.460 | -35.016*** | -25.471 | -3.740 | 0.088** | 0.181* | 0.123 | -3.205*** | -0.213 |
| | (144.203) | (221.571) | (9.166) | (16.031) | (2.575) | (0.038) | (0.095) | (0.128) | (0.942) | (0.228) |
| Share Catholic 1925 | 49.848* | 2.408 | 1.514 | -3.319 | 0.832** | 0.004 | 0.008 | 0.003 | 0.053 | 0.023 |
| | (29.168) | (20.218) | (1.663) | (2.644) | (0.356) | (0.003) | (0.006) | (0.010) | (0.144) | (0.033) |
| Share Jewish 1925 | -8.289 | -260.152 | -167.086 | -136.533** | 5.955 | 0.113** | 0.198** | -0.004 | 1.468 | -0.023 |
| | (455.846) | (1000.049) | (132.262) | (62.124) | (4.178) | (0.047) | (0.089) | (0.143) | (5.673) | (0.679) |
| Share unemployed 1925 | -86.613 | 477.258* | 27.673 | 117.654*** | 17.094*** | 0.067* | 0.040 | -0.442*** | 0.845 | -0.947 |
| | (265.132) | (272.415) | (22.271) | (41.040) | (3.693) | (0.040) | (0.073) | (0.119) | (1.904) | (0.594) |
| Other controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $N(cities)$ | 65 | 69 | 81 | 81 | 72 | 84 | 84 | 84 | 78 | 84 |

Notes: The table presents IV estimates for the export shock on city level economic outcomes. Panel A includes no controls and Panel B additionally controls for Catholic, Jewish and unemployment share in 1925 expanding on Panel B of Table 1. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.4: Determinants of the Communist vote

| | Adding baseline controls | | | | Communist pre-crisis Stronghold | Not |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Panel A. OLS* | | | | | | |
| Δ EX 28-32 | 0.056*** | 0.081*** | -0.021 | -0.021 | -0.040 | 0.109*** |
| | (0.016) | (0.018) | (0.023) | (0.023) | (0.030) | (0.034) |
| Share ind. empl. 1925 | | | 0.143*** | 0.146*** | 0.098** | 0.109*** |
| | | | (0.023) | (0.024) | (0.038) | (0.032) |
| Urban pop 1925 | | | -0.002 | 0.006 | 0.003 | 0.039 |
| | | | (0.010) | (0.011) | (0.014) | (0.078) |
| Share unemployed 1925 | | | -0.050 | -0.037 | -0.196 | -0.017 |
| | | | (0.059) | (0.059) | (0.133) | (0.059) |
| Share Catholic 1925 | | | | 0.010*** | 0.019** | 0.009*** |
| | | | | (0.003) | (0.009) | (0.004) |
| Share Jewish 1925 | | | | -0.454** | -0.492 | 0.046 |
| | | | | (0.212) | (0.402) | (0.241) |
| Constituency FE | No | Yes | Yes | Yes | Yes | Yes |
| State FE | No | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.022 | 0.252 | 0.296 | 0.307 | 0.380 | 0.373 |
| *Panel B. IV* | | | | | | |
| Δ EX 28-32 | 0.049** | 0.092*** | -0.012 | -0.015 | -0.053 | 0.171** |
| | (0.020) | (0.024) | (0.041) | (0.041) | (0.047) | (0.071) |
| $R^2$ | 0.022 | 0.252 | 0.296 | 0.307 | 0.389 | 0.414 |
| $N(counties)$ | 785 | 785 | 785 | 785 | 373 | 412 |

Notes: The table presents the effect of the export shock on change in KPD vote share between the parliamentary elections in May 1928 and June 1932. Panel A presents the OLS-estimates for the export shock. Panel B presents the IV-estimates using US imports from France and the UK as instrument. Column (1)–(4) present estimates corresponding to our baseline table. Column (5) and (6) split the sample into communist strongholds (> 5% vote share) and places of weak support for the communists (< 5% vote share) in pre-crisis Reichstag elections, respectively. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.5: City-level political results

| | NSDAP | DNVP | Other | Zentrum | SPD | KPD |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Panel A. OLS* | | | | | | |
| Δ EX 28-32 | -0.327 | 0.232 | 0.330 | 0.010 | 0.127 | -0.139 |
| | (0.296) | (0.215) | (0.220) | (0.076) | (0.160) | (0.158) |
| $R^2$ | 0.858 | 0.776 | 0.869 | 0.708 | 0.711 | 0.629 |
| *Panel B. IV* | | | | | | |
| Δ EX 28-32 | -0.448*** | 0.042 | 0.365*** | -0.015 | 0.082 | 0.016 |
| | (0.148) | (0.085) | (0.123) | (0.094) | (0.134) | (0.098) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| F-stat (1st stage) | 107.36 | 107.36 | 107.36 | 107.36 | 107.36 | 107.36 |
| $R^2$ | 0.826 | 0.713 | 0.829 | 0.665 | 0.704 | 0.612 |
| $N(cities)$ | 76 | 76 | 76 | 76 | 76 | 76 |

Notes: The table presents city level political results for the effect of the export shock on change in party vote share as specified in the column header. Specifications include baseline political controls: Industry employment share, unemployment share, urban population, Catholic and Jewish share in 1925 as well as constituency fixed effects. Robust standard errors in parentheses clustered on district. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.6: Export shock and population growth

| | 1920-24 | | 1924-28 | | 1928-32 | |
|---|---|---|---|---|---|---|
| | OLS | IV | OLS | IV | OLS | IV |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Δ EX 28-32 | 0.132 | -0.063 | -0.009 | -0.018 | -0.046 | -0.048 |
| | (0.080) | (0.196) | (0.045) | (0.063) | (0.045) | (0.066) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| $R^2$ | 0.114 | 0.114 | 0.191 | 0.191 | 0.159 | 0.159 |
| $N(counties)$ | 783 | 783 | 785 | 785 | 785 | 785 |

Notes: The table presents the effect of the export shock on county-level population growth over time. The number of eligible voters in 1920, 1924, 1928 and 1932 Reichstag elections are used as proxy as no better data is available. Robust standard errors in parentheses clustered on district. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.7: Alternative measures of trade flows

| | OLS (1) | IV (2) | OLS (3) | IV (4) | OLS (5) | IV (6) |
|---|---|---|---|---|---|---|
| Δ EX 28-32 | -0.157** | -0.226** | -0.166*** | -0.252** | -0.231*** | -0.288*** |
| | (0.064) | (0.108) | (0.064) | (0.117) | (0.068) | (0.111) |
| Net EX 27 | -0.050** | -0.041* | | | | |
| | (0.022) | (0.024) | | | | |
| Δ Net EX 27-28 | | | -0.062 | -0.010 | | |
| | | | (0.173) | (0.181) | | |
| Δ IM 28-32 | | | | | -0.087** | -0.100** |
| | | | | | (0.034) | (0.041) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| F-stat (1st stage) | | 37.75 | | 27.16 | | 42.20 |
| $R^2$ | 0.829 | 0.829 | 0.828 | 0.828 | 0.829 | 0.829 |
| $N(counties)$ | 785 | 785 | 785 | 785 | 785 | 785 |

Notes: The table presents robustness checks controlling for net exports 1927, change in net exports 1927-28 and imports 1928-32. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.8: Weighting by population and alternative clustering

| | Clustering | | | Pop Weights | | |
|---|---|---|---|---|---|---|
| | Dist. (1) | Const. (2) | State (3) | All (4) | Excl-10 (5) | Cities (6) |
| *Panel A. OLS* | | | | | | |
| Δ EX 28-32 | -0.186*** | -0.186*** | -0.186*** | -0.166*** | -0.149*** | -0.247 |
| | (0.053) | (0.051) | (0.056) | (0.050) | (0.049) | (0.316) |
| *Panel B. IV* | | | | | | |
| Δ EX 28-32 | -0.257*** | -0.257*** | -0.257*** | -0.121 | -0.158* | -0.401** |
| | (0.087) | (0.085) | (0.090) | (0.126) | (0.094) | (0.201) |
| F-stat (1st stage) | 28.43 | 25.97 | 20.98 | 16.53 | 28.69 | 45.24 |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| $N$ | 785 | 785 | 785 | 785 | 775 | 76 |

Notes: The table presents baseline estimates using standard errors clustered at the district, constituency and state level as well as population weights in full county sample, when excluding the 10 most populous cities (accounting for >20% of weighted observations), a restricted city-sample. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.9: Shift-share variable analysis

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| *Panel A. OLS shift-share analysis* | | | | | | | | |
| Δ EX 28-32 | -0.282*** | -0.225*** | -0.225*** | -0.242*** | -0.230*** | -0.230*** | -0.230*** | -0.230*** |
| | (0.098) | (0.054) | (0.057) | (0.086) | (0.073) | (0.078) | (0.070) | (0.073) |
| *Panel B. IV shift-share analysis* | | | | | | | | |
| Δ EX 28-32 | -0.391** | -0.349*** | -0.349*** | -0.178* | -0.377*** | -0.377** | -0.377*** | -0.377*** |
| | (0.188) | (0.111) | (0.107) | (0.102) | (0.137) | (0.153) | (0.145) | (0.139) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Outliers | Yes | No | No | No | No | No | No | No |
| Fixed effects | None | Census-1 | Census-1 | Census-2 | Trade-1 | Trade-1 | Trade-1 | Trade-1 |
| Nr. fixed effects | – | 15 | 15 | 101 | 19 | 19 | 19 | 19 |
| Clustering | Robust | Robust | Census-2 | Census-2 | Robust | Trade-2 | Trade-3 | Trade-4 |
| Nr. of clusters | – | – | 101 | 101 | – | 62 | 89 | 166 |
| F-stat (1st stage) | 7.50 | 9.23 | 37.28 | 14.39 | 10.92 | 7.14 | 10.81 | 12.37 |
| $N(industries)$ | 169 | 187 | 187 | 187 | 187 | 187 | 187 | 187 |

Notes: The table reports results for the dataset as exposure-weighted "industry-level" aggregates as described in Borusyak et al. (2022). Column 1 excludes top and bottom 5% of exposed industries to the export shock (instrument) in panel A (B). Remaining columns presents results using fixed effects and clustering based on more aggregate industry categories provided in German Census or Trade Statistics as specified. The most detailed industry level available is the 3-level for the German Census and 5-level for German Trade Statistics. The row specifying number of fixed effects and number of clusters reports how many industries the respective more aggregate classifications used contains. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.10: Excluding 19 main traded sectors at a time

| *Panel A. OLS* | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| Δ EX 28-32 | -0.175*** | -0.210*** | -0.187*** | -0.168*** | -0.231*** | -0.168*** | -0.190*** | -0.189*** | -0.181*** | -0.194*** |
| | (0.054) | (0.053) | (0.053) | (0.062) | (0.077) | (0.057) | (0.055) | (0.054) | (0.054) | (0.054) |
| | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | |
| Δ EX 28-32 | -0.186*** | -0.188*** | -0.187*** | -0.211*** | -0.192*** | -0.188*** | -0.189*** | -0.186*** | -0.170*** | |
| | (0.054) | (0.053) | (0.053) | (0.056) | (0.056) | (0.054) | (0.058) | (0.053) | (0.059) | |
| *Panel B. IV* | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Δ EX 28-32 | -0.268*** | -0.297*** | -0.258*** | -0.151 | -0.361*** | -0.234** | -0.263*** | -0.260*** | -0.255*** | -0.264*** |
| | (0.100) | (0.091) | (0.087) | (0.126) | (0.116) | (0.112) | (0.089) | (0.087) | (0.087) | (0.087) |
| F-stat (1st stage) | 24.65 | 26.03 | 28.43 | 19.81 | 109.20 | 27.16 | 28.43 | 28.58 | 28.43 | 28.30 |
| | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | |
| Δ EX 28-32 | -0.261*** | -0.257*** | -0.262*** | -0.256*** | -0.297*** | -0.261*** | -0.290*** | -0.257*** | -0.242*** | |
| | (0.087) | (0.087) | (0.087) | (0.093) | (0.092) | (0.090) | (0.096) | (0.087) | (0.087) | |
| F-stat (1st stage) | 27.96 | 28.41 | 28.28 | 25.06 | 26.55 | 27.75 | 26.47 | 28.43 | 25.53 | |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| $N(counties)$ | 785 | 785 | 785 | 785 | 785 | 785 | 785 | 785 | 785 | 785 |

Notes: The table excludes individually each 1-level trade category from the sample: (1) Food products; (2) Mineral and fossil fuels; (3) Oil, fat and wax products; (4) Chemicals and pharmaceuticals; (5) Textiles; (6) Leather; (7) Rubber products; (8) Braids; (9) Straw and braided products; (10) Brooms, brushes, etc. (11) Carved and moulded products from natural materials; (11) Paper products; (12) Books, pictures, etc.; (13) Stone products; (14) Pottery; (15) Glass; (16) Noble metal products; (17) Base metal products; (18) Machinery and vehicles; (19) Firearms, watches, toys, etc. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, ***

Table B.11: Effect on presidential elections

| *Panel A. Overall effect export shock* | | | | |
|---|---|---|---|---|
| | Hindenburg | Hitler | Thälmann | Other |
| | (1) | (2) | (3) | (4) |
| $\Delta$ EX 28-32 | 0.606*** | -0.301*** | 0.003 | -0.308** |
| | (0.194) | (0.097) | (0.025) | (0.122) |
| F-stat (1st stage) | 39.97 | 39.97 | 39.97 | 39.97 |
| $R^2$ | 0.847 | 0.803 | 0.296 | 0.840 |
| *Panel B. Occupational breakdown* | | | | |
| $\Delta EX$ White collar | 5.972*** | -4.672*** | 0.478 | -1.778 |
| | (2.313) | (1.444) | (0.365) | (1.329) |
| $\Delta EX$ Blue collar | -0.605 | 0.692** | -0.092 | 0.005 |
| | (0.590) | (0.316) | (0.093) | (0.384) |
| $\Delta EX$ Self employed | -0.277 | 0.103 | -0.161 | 0.334 |
| | (2.368) | (0.931) | (0.298) | (1.564) |
| F-stat (1st stage) | 11.68 | 11.68 | 11.68 | 11.68 |
| $R^2$ | 0.848 | 0.802 | 0.291 | 0.840 |
| Controls | Yes | Yes | Yes | Yes |
| $N(counties)$ | 785 | 785 | 785 | 785 |

Notes: The regressions present the effect on the change in the vote share of candidates in the run-off elections for the Reichspräsident between 1925 and 1932. Hindenburg (especially in 1932) being the moderate candidate supported by a coalition of parties, while Hitler and Thälmann are the candidates for the far-right (Nazi party) and far-left (KPD), respectively. Other represents the votes other candidates received. Panel A presents the overall effect of the export shock and Panel B breaks the export shock down by occupational groups. All specifications are IV estimates and include the full set of controls. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.12: Indirect export shock using different administrative levels

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Δ IEX (transport) | 0.200** | | | |
| | (0.088) | | | |
| Δ IEX (constituency) | | 0.207** | | |
| | | (0.090) | | |
| Δ IEX (state) | | | 0.116 | 0.242** |
| | | | (0.116) | (0.119) |
| F-stat (1st stage) | 17.94 | 18.24 | 18.89 | 9.62 |
| $R^2$ | 0.736 | 0.735 | 0.732 | 0.677 |
| *Nr. adm. units* | 47 | 35 | 18 | 17 |
| $N(counties)$ | 777 | 782 | 781 | 357 |

Notes: The table present the effect of the indirect export shock constructed based on transport district subdivision, constituency, and state-boundaries. Column 1 explores subdivisions of the 21 pre-WWI transport districts using Weimar-era constituency and state-borders to further disaggregate them and account for territorial concessions. Apart from accounting for state-borders, the constituency borders divide the largest 6 transport districts into equally sized continuous geographic units in the following way: 5th transport district is divided into Weser-Ems, East- and South-Hannover. The 8th is divided into Breslau and Liegnitz. The 9th is divided into Berlin, Potsdam and Frankfurt-Oder with the small remaining Western parts of the former 1st and 6th incorporated into Frankfurt-Oder. The 13th is divided into Koblenz, Cologne, West- and East-Düsseldorf. The 15th is divided into North- and South-Westphalia. The 21st is divided into Franconia, Upper- and Lower-Bavaria. Column 2 explores the constituency-level indirect export shock. Column 3 explores the state-level indirect export shock. Columns 4 excludes the state of Prussia (54% of counties). Robust standard errors in square-brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.13: Alternative definitions of rural and urban counties

| | Rural counties | | Urban counties | |
|---|---|---|---|---|
| | Grav | Dist | Grav | Dist |
| | (1) | (2) | (3) | (4) |
| *Panel A. Threshold urban population* $> 0\%$ | | | | |
| $\Delta$ IEX 28-32 | 0.395*** | 0.413** | 0.040 | 0.112 |
| | (0.145) | (0.195) | (0.041) | (0.098) |
| F-stat (1st stage) | 58.56 | 57.18 | 13.74 | 14.09 |
| $R^2$ | 0.785 | 0.782 | 0.697 | 0.704 |
| $N(counties)$ | 222 | 222 | 563 | 552 |
| *Panel B. Threshold urban population* $> 50\%$ | | | | |
| $\Delta$ IEX 28-32 | 0.115** | 0.206** | 0.022 | 0.130 |
| | (0.054) | (0.098) | (0.072) | (0.145) |
| F-stat (1st stage) | 13.97 | 13.28 | 13.09 | 13.87 |
| $R^2$ | 0.752 | 0.753 | 0.613 | 0.634 |
| $N(counties)$ | 635 | 628 | 150 | 146 |
| *Panel C. Threshold urban population* $> 75\%$ | | | | |
| $\Delta$ IEX 28-32 | 0.086* | 0.220*** | 0.018 | -0.159 |
| | (0.048) | (0.083) | (0.087) | (0.250) |
| Controls | Yes | Yes | Yes | Yes |
| Const. & State FE | No | No | No | No |
| F-stat (1st stage) | 14.34 | 14.03 | 6.46 | 9.44 |
| $R^2$ | 0.751 | 0.753 | 0.473 | 0.502 |
| $N(counties)$ | 715 | 708 | 70 | 66 |

Notes: The table present IV estimates for the effect of the gravity and district indirect export shock broken-down by rural and urban areas. Rural and urban areas are defined by the urban population share exceeding 0% in Panel A, 50% in Panel B and 75% in Panel C. Robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

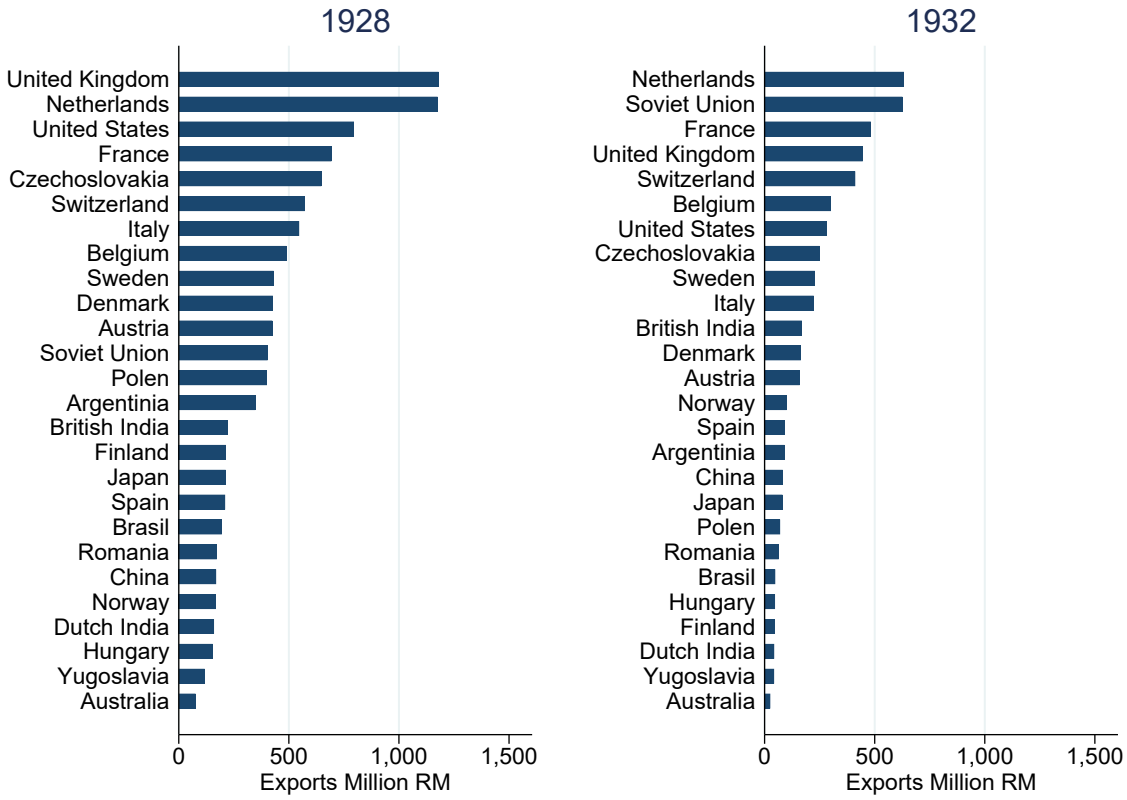
# C Data Appendix

## C.1 Trade data

We collect our trade data from the German Trade Statistics 1928-1932 (see Statistisches Reichsamt 1928-1932). These contain data on German exports and imports by country and product in terms of value and quantity. The trade categories are in general organised along 4-levels of detail (for a few categories 5-levels). We collect information on 2278 (2344) trade categories, the most detailed level for the years 1928 (1932), to be merged to aggregated industrial sectors that match German census data (on which more below).

For nearly all categories, trade in terms of value and quantity decreased. This is unsurprising considering that the Great Depression in Germany was a deflationary period (see Rath 2009). It appears likely that prices for products dropped more in sectors harder hit by a decline in foreign demand. Both the effect of the decline in quantity exported and drop in prices should go in the same direction increasing the economic impact of the export shock. For this reason we use nominal values to measure the decline in German exports. In addition, nominal value data does not suffer from the problem that the recorded type of quantity changes between 1928 and 1932 for some products complicating the construction of German export data at the product level in quantity or real values.

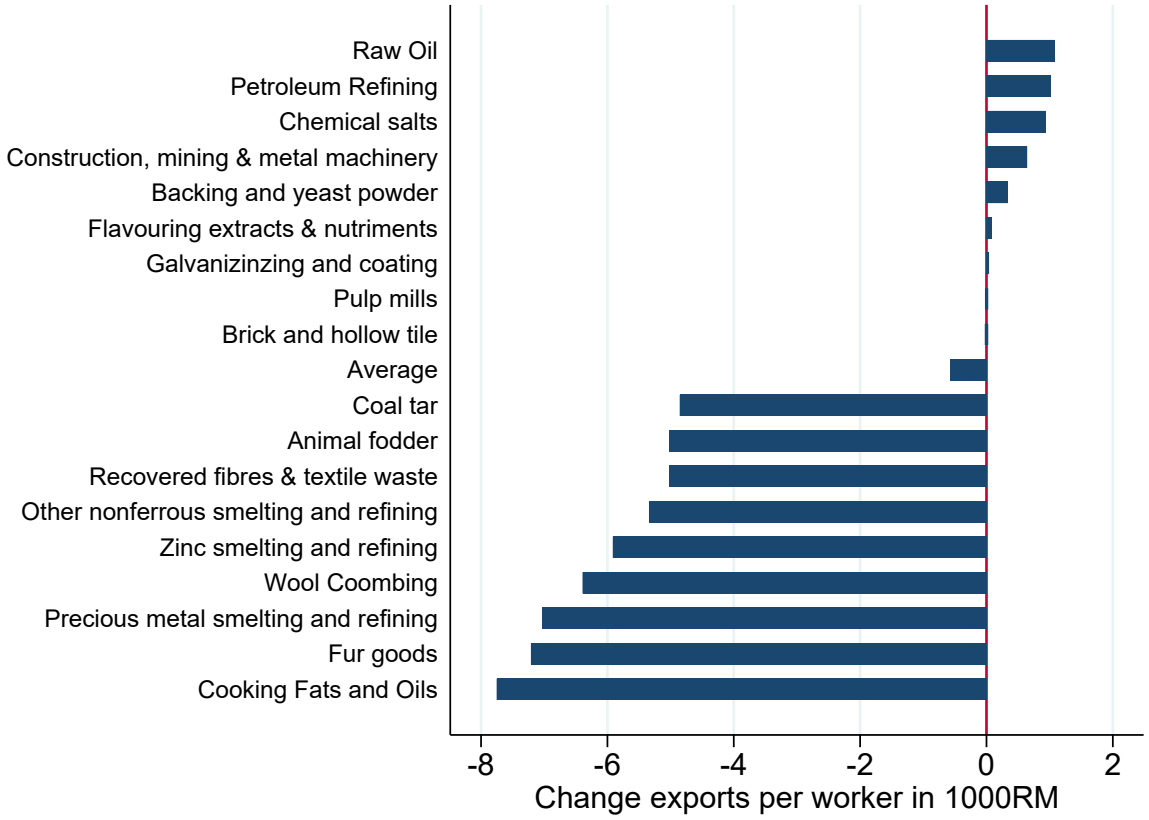
Figure C.1: German exports by country




Notes: German exports to main destination countries in million Reichsmark for the years 1928 and 1932.
Source: Statistisches Reichsamt 1925-1938

Appendix Figure C.1 illustrates the drastic decline in German exports between 1928 and 1932. During the 4-year period between 1928 and 1932, the value of German exports declined to all major trade partners apart from the Soviet Union by a factor of 2-3, from a total of 12,025 to 5,736 million Reichsmark with the decline being particularly pronounced for the US. This implies a 53.3% decline in German exports. In comparison, the total German GDP (see "Volkswirtschaftliche Bilanz" in Statistisches Reichsamt 1925-1938) was 75,373 (45,266) million Reichsmark in 1928 (1932), which implies the value of German exports was 15.9% and 12.7% of German GDP, respectively. Appendix Figure C.2 highlights that the decline differed consideraly across industrial sectors with the most exposed sectors experiencing a more than 10 fold higher decline in exports per worker than the average sector. Also, for a small set of sectors exports remained stable or even grew during the Great Depression.

Figure C.2: Exposure to decline in exports 1928-32

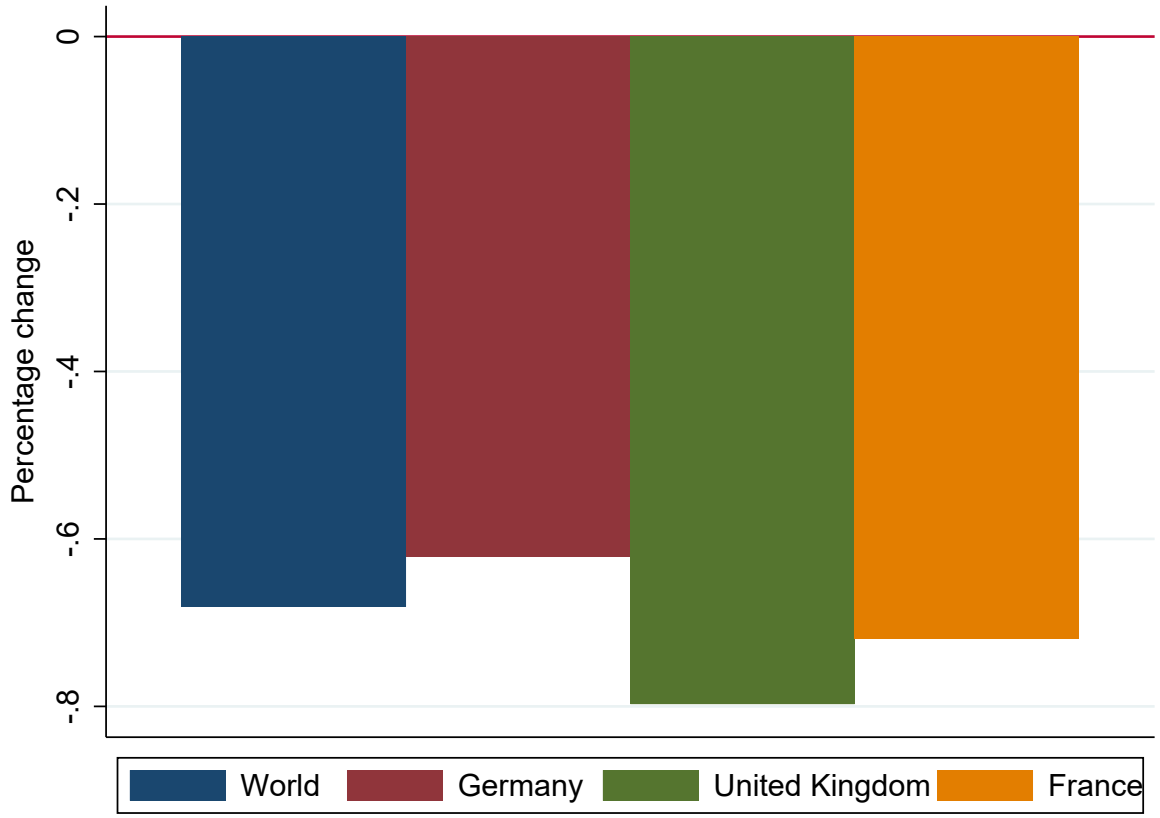



Notes: Change in exports per worker for average industry (unweighted mean), those below the 5th percentile and above the 95th percentile. Exposure per worker constructed by the authors from Statistisches Reichsamt (1928-1932) and Statistisches Reichsamt (1925) data.

We also collect detailed US imports by product category from Germany, the UK and France from the "The foreign commerce and navigation of the United States" (see United States Department of Commerce 1928-1932). The US trade data provides information by origin for more than a thousand different products (the number differs slightly between 1928 and 1932), we also aggregate this data to our merged industrial sectors. Comparing the German records on exports to the US with US records of imports from Germany after merging the data suggests a decent quality of matching US and German classifications. We

use this second source of trade data on US imports from the UK and France to construct our exogenous measure of the decline in foreign demand during the Great Depression that is not affected by developments inside of Germany. Appendix Figure C.3 highlights that total US imports of manufactures (excluding raw agricultural products) declined by 68% between 1928 and 1932 and that the decline in US imports across countries was very similar. This suggests that the decline in US imports was driven by an exogenous change in US demand.

FIGURE C.3: CHANGE IN US IMPORTS 1928-32




Notes: Percentage change in US imports from World and main European trading partners between 1928 and 1932. Source: United States Department of Commerce 1928-1932

## C.2 Employment data

To assess the effect of the decline in exports during the Great Depression on the German economy and politics, we need data on industrial employment by industry, that can be matched to our trade categories, and geographic area. The most detailed source of this data is the German census of 1925 (see Statistisches Reichsamt 1925). Note that this employment by industry is based on the sector a worker's firm operates in, while the occupation (with major categories blue-collar, white-collar, owner) is recorded separately. However, the industrial census also provides a breakdown of occupations by industry at the national level. The industrial categories are reported along 3-levels of

detail with the most detailed level we collect recording 426 different industries.[64] The census information on employment across industries is provided by cities "Stadtkreis" and rural counties "Landkreis" (these rural counties can either surround a city or do not have a major urban centre) covering the whole of Germany. This is the German fourth-level administrative divisions below the state ("Land"), province ("Provinz", only for Prussia) and administrative region ("Regierungs-Bezirk") and above the municipality ("Gemeinde"). The exact names of these administrative divisions differed across Germany. Note The census records provide information on 1481 geographic areas. Depending on the data availability for our variables of interest we either use the city level (economic analysis) or construct local labour market areas combining cities and their surrounding rural counties (political analysis).[65]

From the 1925 census, we also collect data on a breakdown of industry employment by occupations. We collect data on number of blue- and white-collar workers as well as owners/self-employed individuals for each 2-digit industry (102 categories) at the national level. There is notably considerable variation in employment shares across industries for these groups. This breakdown allows us to further study the differential effect of the trade shock on workers in white- and blue-collar occupations. This is of particular interest as white- and blue collar industrial workers were distinguished socio-economic groups with distinct unions and political parties catering to their interests (see Childers 2010).

We match our 2000+ trade categories with our 426 census categories into 144 merged industrial categories. This considerable drop in number of sectors is due to us aggregating trade and census categories to a level were they uniquely match. For example we match 41 different 4-digit types of cotton yarn and thread part of the 3-digit category "spun cotton" (Gespinste aus Baumwolle) from the German trade statistics to the 3-digit census categories "cotton mill" (Baumwollspinnerei) and "cotton twisting" (Baumwollzwirnerei, -spulerei, -haspelei) both part of the 2-digit census category "cotton industries" (Baumwollindustrie) into the merged category "cotton yarn and thread". The availability of aggregate categories and detailed individual categories makes us confident in our matching in the absence of a formal crosswalk, which to the best of our knowledge does not exist.

Calculating the 1928-32 change in German exports across our 144 traded sectors and combining this information with the 1925 census data on county-level employment in those sectors and population, we can now calculate the county-level measure of exposure to the export shock defined in equation 1. Our export shock and manufacturing share are constructed based on the employment in traded industries and total county population and numbers reported reflect the average across counties as presented in the summary statistics in Appendix Table B.1. We use population rather than total employment as denominator because the data in the Betriebszahlung we digitized from the Statistisches Reichsamt 1925 only reports manufacturing and services, but not agriculture. Note that total population in Germany was 62.4 million, employment was 31.9 million, manufacturing employment 13.2 million (including also non-traded construction and utilities in the German census) and traded manufacturing employment 9.7 million. So that employment in traded industries accounted for about 30% of German employment.

[64]The data also provides information on firms in services, however we only collect information on manufacturing firms. The number of different industries (426) noted here corresponds to the number of industries in manufacturing.

[65]We also deal in both cases with changes in geographic boundaries through aggregation of geographic areas when necessary. This aggregation is based on Hubatsch & Klein (1975) and MPIDR (2014).

Exposure to the trade shock for the average county is 60RM per person (≈ 304€in 2015, see Wissenschaftliche Dienste 2016). This would be equal to roughly 2 weeks wages for an unskilled worker (based on a 38RM weekly wage in April 1928 , Source: Statistisches Reichsamt 1925-1938). However, not that our export shock is only for industrial products with the industrial employment share in those sectors making up only 12% of the total population. Accordingly, if the export shock would be affecting all workers the same the shock is equal to 17 weeks wages for an unskilled worker and 12 weeks for a skilled worker (50RM weekly wage for skilled workers). This sizeable shock can be expected to have a considerable impact on the local economy. Appendix Table B.1 documents the considerable geographic variation in exposure to the export shock. Counties at the 75th percentile of exposure experienced a decrease in exports of 80RM per person, which is roughly four times as large as that faced by a county at the 25th percentile.

## C.3 Political data

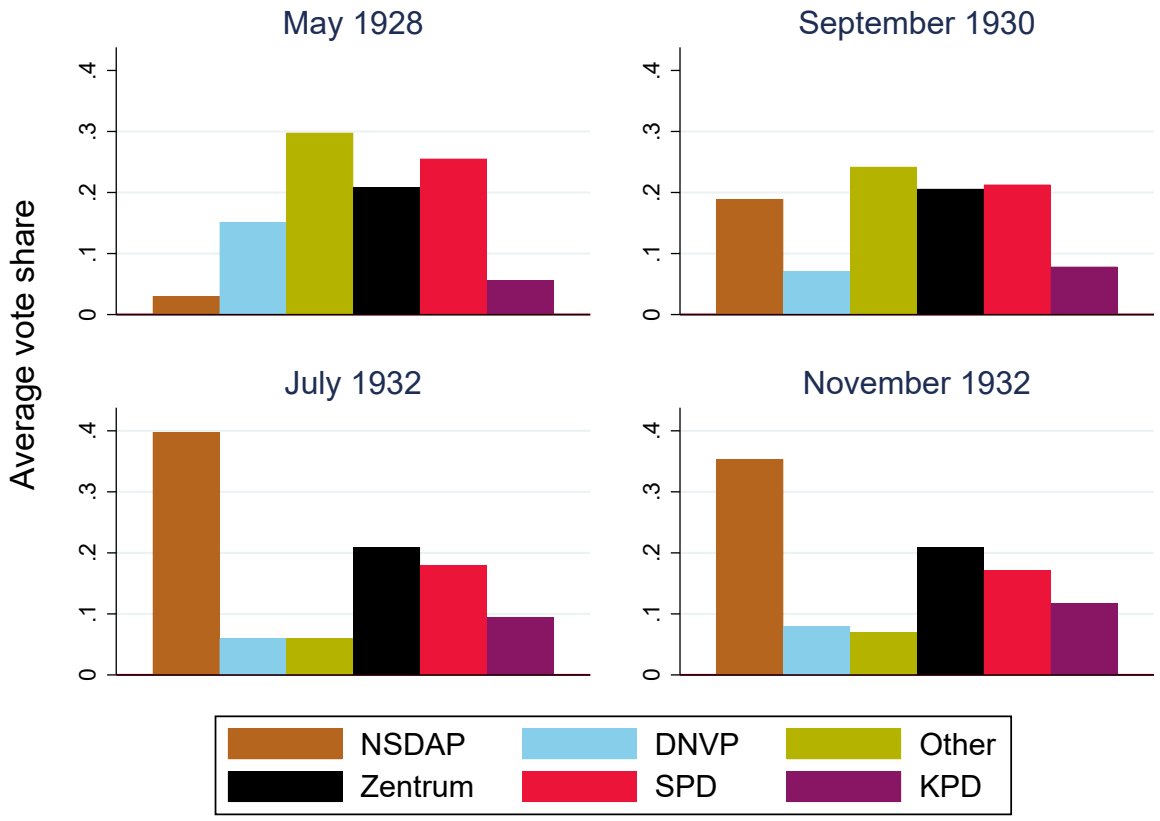
This section discusses the political data collected on election outcomes. We obtain the share of votes for different parties across counties from ICPSR (2005). [66] This allows us to measure the change in support for parties between 1928 and 1932. We focus primarily on the elections of 20th May 1928 and 31st July 1932. Between these elections the NSDAP drastically increased their vote share from 2.6% (12 of 491 Reichstag seats) to 37.27% (230 of 608 Reichstag seats). Focusing on these elections has the benefit that they present the last vote before the peak of the Great Depression and also both occur in Summer.[67] The July 1932 election also reflects the peak success of the NSDAP in free election as their vote share started to drop in the November 1932 election to 33.09%.

The five largest parties (NSDAP, SPD, KPD, Zentrum, DNVP) won 91.54% of votes and 564 of 608 seats in July 1932. The remainder of the votes were won by a vast set of other parties reflecting a vast set of regional and special interest groups as more than 32 parties received more than 1,000 votes in the July 1932 election. Appendix Figure C.4 illustrates the change in the party landscape of Weimar Germany during the Great Depression. It depicts the average vote share of the 5 major parties and other parties ordered roughly along their right to left political orientation. The major parties in 1932, apart from the NSDAP, also received the highest share of votes in 1928. The set of other parties in 1928 reflected a vast set of diverse political parties with the three most important being the German People's Party (8.7% of total votes), German Democratic Party (4.8%) and the Reich Party of the German Middle Class (4.5%). Representing centre-left to right-wing position and predominantly urban-industrial interests. This vast set of parties made up around 30% of the total votes received. Accordingly, in 1928 the political landscape of Weimar Germany was even more fragmented in 1928 than 1932. Appendix Figure C.4 also highlights the drastic rise of the Nazi vote share in the 1930 and 1932 elections and the corresponding decline in the vote share of the DNVP and the set of other parties, while the vote share of the Zentrum, SPD and KPD remained relatively stable (the SPD vote share slightly declined while the KPD vote share increased). This was driven by a drastic shift of protestant middle-class and rural voters from these parties to the NSDAP.

[66] For the minor state of Bremen voting data is missing for May 1928 in ICPSR (2005), we use available information on party votes from the previous election (December 1924). Results are robust to excluding all 3 counties of Bremen.

[67] This lessens concerns that our result might be driven by seasonality.

FIGURE C.4: GERMAN ELECTIONS 1928-32




Notes: The figure presents the average vote share across counties for the May 1928, September 1930, July 1932 and November 1932 elections of major parties for the German Reichstag.

We collect three additional pieces of data from ICPSR (2005): First, the outcomes of the June 1920 and May 1924 elections to check for any pre-trends in party vote shares. Second, the election outcomes from the German presidential elections for Hindenburg, Hitler, Thälman and other candidates in 1925 and 1933, which we use to confirm our results observed for political parties. Third, we use the 1925 census data on population, religion, employment in sectors outside of industry, unemployment, Wahlkreiscode and Land-Reg Bezirk code.

## C.4 Other economic data

This section provides detailed information on the data collected from the Statistical Yearbook of Germany (see Statistisches Reichsamt 1925-1938), which provides yearly industry level data at the national level, and the Statistical Yearbook of German Cities (see Deutscher Städtetag 1925-1934), which provides yearly data on economic indicators at the city level.

The first source, the Statistical Yearbook of Germany, provides industry level data on value and quantity of output, employment, wages and number of firms.[68] The data

[68]For some industries no data is available to directly construct the change in the variables between 1928 and 1932 as data for some years is missing. Nearly, all of these industries are in textiles for which no data is reported 1929-1932 during the Great Depression, but starts to be reported again in 1933. To

does not correspond directly to the detailed census classification but is considerably more aggregated. To correspond to this we aggregate our measure of the decline in exports accordingly. The data also does not report all industries, but it seem to provide a good reflection of the German economy. Industries from the following major sectors are reported (as referred to in the source): 1. Mining, 2. coal industries, 3. iron industries, 4. steel works, 5. chemical industries, 6. textile industries, 9. oil and fat industries, 10. machinery, 11. automobile and tire industries, 12. iron- and steel-ware industries, 13. leather industries, 16. food industries.[69] The collected data allows us to measure the effect of exposure to the export shock on the growth in the respective measure of economic activity across industries. This will provide the first set of evidence on the fact that the decline in exports had a negative economic effect on the Weimar economy.

We complement this data with information from our second source, the Statistical Yearbook of German Cities, which provides information on electricity usage, commuting, tax revenues, unemployment and saving for cities with a population of more than 50,000 inhabitants. These cities account for 32.9% (21.2 of 64,5 million) of the German population in 1928. This covers 94 cities with a population above 50,000 inhabitants by 1928 (97 in 1932). The actual number of observations in the sample used is smaller as 7 cities undergo considerable administrative changes to their boundaries that cannot be traced over time. For example, the creation of the new city of Wuppertal out of the city of Barmen and the towns of Ronsdorf, Vohwinkel and Cronenberg. As we only have data on Barmen, but not Rinsdorf, Vohwinkel and Cronenburg, in 1928 and Wuppertal in 1932 we have to exclude this observation. Also either data for some controls or some dependent variables were not reported for certain cities.

From this data we construct the following variables on economic activity across cities.

(1) The change in electricty usage in kilowatt-hours (kWh) per recipient of a cities electricity supply grid between 1928 and 1932.[70] The electricity usage provides a good proxy for economic activity in a city especially in terms of industrial production. The census suggests that by 1925 roughly half the power used in manufacturing was in the form of electricity with water, wind, steam engines and vehicles reporting a combined power roughly equivalent (see Statistisches Reichsamt 1925).

(2) The change in number of persons transported by public transport per inhabitant measuring the commuting flows of individuals in a cities.

(3) The change in the share of unemployed in a city. As the unemployment support system of the Weimar Republic undergoes considerable changes between 1928 and 1932 we construct 3 different measures for the unemployment rate. The first focusses exclusively on the unemployed in the formal unemployment insurance system (ALU), the second also includes the ones supported by emergency aid (ALU+KRU), the third also includes the unemployed supported by community care (ALU+KRU+WE).[71] The last of course is

deal with this issue we use the data in the next available year and adjust it to the previous year based on the on the change between years for industries in which we have yearly data available.

[69]The numbering of major sectors changes between years and is mostly based on the 1933 Statistical Yearbook. The not reported sectors are either not traded, e.g. 15. electricity generation, or no data is reported for years close to 1928 or 1932, so that it is not possible to measure the impact of the export shock on these industries.

[70]Further breakdowns of the data, despite differing by electricity supplier in the definition and being not reported for all cities, suggest that more than half of electricity supplied in 1928 is to large industrial customers ("Großabnehmer").

[71]The number of unemployed is only reported from 1930 onwards in the Statistical Yearbook of German Cities, before that we use data on the number of unemployed from the Statistical Yearbook of Germany. However, the data for 1928 only reports number of recipients in the unemployment insurance system

likely to be somewhat idiosyncratic in measurement as it seems to highly depend on a cities local support provided. So that financial constraints might reduce the number of individuals supported leading us to underestimate the effect of the export shock on this measure of unemployment.

(4) The change in tax collection by city population. Here we again use a variety of measures of tax collection with each providing a different insights into the economic effect and having its unique short-comings. The first measure is the corporation taxes collected by a city. This measure accordingly reflects whether the decline in export demand leads to a change in the revenue of companies. The second measure is the consumption taxes per inhabitant collected by a city. [72] Reflecting local spending on consumption goods by inhabitants. A concern with both measures is that local governments might change tax rates to compensate for declines in revenue due to the economic crisis. However, this would go against us finding an effect of the export shock on the taxes collected and lead us to underestimate the actual effect. The third measure is the tax receipts returned from the central government to cities. These are about 80% based on income taxes imposed and collected by the central government. The remainder was primarily from consumption taxes also administered by the central government. These tax revenues were collected by the central government and than in part returned to the city based on a distribution key with no plan for any horizontal transfers between municipalities (see Palmer 2018). Accordingly, the tax revenues returned to a city should reflect local labour incomes. It should however be noted that this measure, despite no vertical transfers in theory, suffers from some measurement error in practice as there occurred some extra transfers of the central government in 1932 to compensate for cancelled taxes due to austerity measures and reimbursements for state owned companies which might have falsely been recorded as tax returns from the central government (see Deutscher Städtetag 1925-1934). This concern would again go against us leading us to underestimate the effect of the export shock. Accordingly, the presented effects for these variables should be seen as a lower bound here.

(5) We collect data on the value of deposits and withdrawal made to local saving banks. This first variable allows us to look at whether individuals become less able to to save due to the export shock. The effect on withdrawals is less clear, while they might increase if individual still have savings to help them deal with the export shock it could also decline if individuals exhausted all their savings already before 1932.

Any of these measures by itself has shortcomings in measuring economic activity, however together they provide a comprehensive picture of the economic effect of the decline in German exports on economic outcomes across cities. We also collect information on city population in 1928 and 1932 to validate our results as population growth of cities should not in a major way be affected by the decline in export demand.

We collect food price data from the Prussian Statistical Yearbook (see Preussisches Statistisches Landesamt 1927-1934) and the already mentioned Statistical Yearbook of Germany (see Statistisches Reichsamt 1925-1938) at the city level to evaluate the impact

(Arbeitslosenversicherung, ALU) at the city level. Recipients receiving support from the Emergency Aid (Krisenfürsorge, KRU) and community care (Gemeindliche Fürsorge, WE) are not reported. As the share of individuals supported in the unemployment insurance drops from 77% in 1929 to 16.2% in 1932 these two insurances appear of particular importance. Accordingly, we construct the share of recipients in the later two insurance systems for 1928 based on the proportion of recipients at the national level in 1929 times the cities unemployed in the unemployment insurance in 1928.

[72] The local consumption taxes were in terms of revenue generated about half as large as the consumption taxes collected by the central government in 1928.

of the export shock on local food prices in the agricultural hinterland surrounding cities. We focus on a set of staple food products commonly consumed across all cities in Germany being potatoes, beans, bread, and eggs in July (based on the most common price recorded for the item across small stores on a Wednesday). The prices are recorded for 1kg apart from eggs, where the price is for a single egg. Figure 2 depicts the considerable variation in food prices across cities in 1928 and 1932 as well as the drastic decline in agricultural prices between 1928 and 1932.

## C.5 Additional notes geographic areas

We aggregate separate geographical observation into our counties for two reasons: (i) geographical boundaries changed during the period 1925-1932 and (ii) a geographical area is denoted as a county-free city ("Stadtbezirk" or "Kreisfreie Stadt"), which we merge to the surrounding geographical area ("Landkreis"). The later merging of cities and the surrounding area is done for two reasons. First, this provides a better reflection of local labour markets as city boundaries do not necessarily reflect the end of a cities build up area and local transportation network. Second, there is considerable discrepancies in the level of detail in the county-free cities recorded between the political data (ICPSR 2005) and the census data (Statistisches Reichsamt 1925). Accordingly, it seems more consistent to not use this geographic distinction of county free city and surrounding county in the main analysis.

For the city-level results where the geographic information is based on the city boundaries (not county boundaries) we use the corresponding geographic data available in the census.

## C.6 Additional notes industry categories

We match by hand the industry categories provided in the German Trade Statistics (see Statistisches Reichsamt 1928-1932) and German Industrial Census (see Statistisches Reichsamt 1925) based on the detailed description of the specific categories. The trade data 2278 (2344) categories in 1928 (1932) reported in 4-levels of categorical detail. The data collected from the German Industrial Census comprises 426 manufacturing industries in 4-levels of categorical detail. The detail provided due to the multiple categories reported considerably helped in classifying the correct trade category and census industry category by hand into our aggregated category. We started by matching first more aggregate categories that match into each other and than focussed on matching the more detailed products. The high level of detail in terms of industry categories in both sources allows us to aggregate categories into a unique matching which does not require any weighting, however this reduces the number of industry categories in our matched classification to 144 different categories.

Following this we match similarly detailed US trade statistics (see United States Department of Commerce 1928-1932) reporting categories in a 4-digit classification into our aggregate industry classification for Germany. From the US data we manually collected the most aggregated categories that uniquely match into our classification (for this reason we did not collect purely agricultural products). Our US trade data collected includes 588 (723) categories in 1928 (1932) for quantity and value of US imports from Germany, France, UK and total.

For example we match the following census category reported as German Census 1-digit: *"B. Industrie und Handwerk"* | German Census 2-digit: *"XVI. Nahrungs- und Genussmittelgewerbe"* | German Census 3-digit: *"12. Kaffeerosterei und Kaffee-Ersatzherstellung"* | German Census 4-digit: *"a) Kaffeerosterei"* with two trade statistics categories German Trade 1-digit: *"1. Abschnitt Erzeugnisse der Land- und Forstwirtschaft und andere tierische und pflanzliche Naturerzeugnisse; Nahrungs- und Genussmittel"* | German Trade 2-digit: *"A. Erzeugnisse des Acker-, Garten-, und Wiesenbaues Kolonialwaren u. Ersatzstoffe fur solche"* | German Trade 3-digit: *"61 Kaffee"* | German Trade 4-digit: *"61b Kaffee, nicht roh"* & *"61c Kaffeepulver, gemischt m. Zucker; Kaffee-Essenz, Auszug von rohen Kaffeeschalen, sirupartig eingedickt"* into the matched category *"Roasted Coffee"* in our classification. Noticeably, the first 3-digits here perfectly match into each other and we only had to distinguish the last level of detail from other categories that match into "Raw Coffee" and "Cereal and coffee substitutes". Here we would accordingly match the US Trade 4-digit category: *"1512. Coffee, Roasted"* to our matched category *"Roasted Coffee"* (note that it is only exported from the US so was not reported in US imports so that it has a value of 0 in our case here).

We can confirm the quality of our matching procedure by analysing the correlation between the matched US trade data (reporting imports from Germany) and German trade data (reporting exports to the US), which is 0.93 and 0.83 for 1928 and 1932, respectively. In general suggesting a decent quality of matching US and German classifications. The lower quality match in 1932 seems to be exclusively driven by US trade statistics reporting much higher values for the import of "meat products" and "fertilizer" in 1932 than we observe for 1932 German exports, while there is no corresponding difference in 1928. Excluding these two categories the data collected from the two sources displays a nearly perfect uphill positive linear relationship of 0.93 (in 1928) and 0.94 (in 1932) across merged categories. As both the US and German classifications only change in a minor way across years this suggests that the main reason for the lower than 1 correlation is the time difference of recording the trade flows between the US and Germany. This idiosyncratic variation in recording however should not be a major concern for our identification when looking at the large decline in trade between 1928 and 1932. Further reasons for the lower than 1 correlation are the following: (i) German trade statistics provide only incomplete information for trade flows of products by partner as the quantities and values reported for individual countries do not sum up to total exports. Also in 1928 only quantities are reported by country for which reason in the German data we have to construct the value of exports to the US based on the price of the product times quantity (with the price being obtained from total export value divided by export quantity). Accordingly, if the price of exports to the US is not equal to the average price this reduces the observed correlation. Importantly, we do not use the German trade data by country in our analysis, so that this is only a concern for comparing the trade flows between German and US trade statistics. (ii) Another potential reason for this discrepancy is the Rotterdam effect, i.e. some US imports recorded arrived from German ports, but did not originate from Germany or vice versa leading to measurement error in the US trade statistics. However at the time this is likely a minor concern. (iii) We, while being as careful as possible, might have made some errors when matching products between their English and German descriptions.

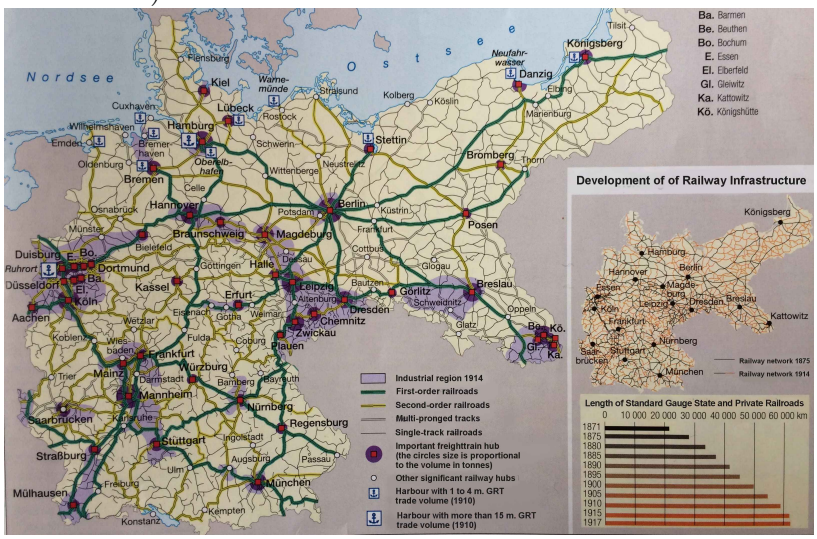
To match our industry level data to the information available on industries from the German statistical yearbooks we simply have to further aggregate our matched categories to correspond to the less detailed information available. Note, also that the German

statistical yearbooks only cover a selected subset of important industries and not the whole universe as the Census and the Trade statistics do.

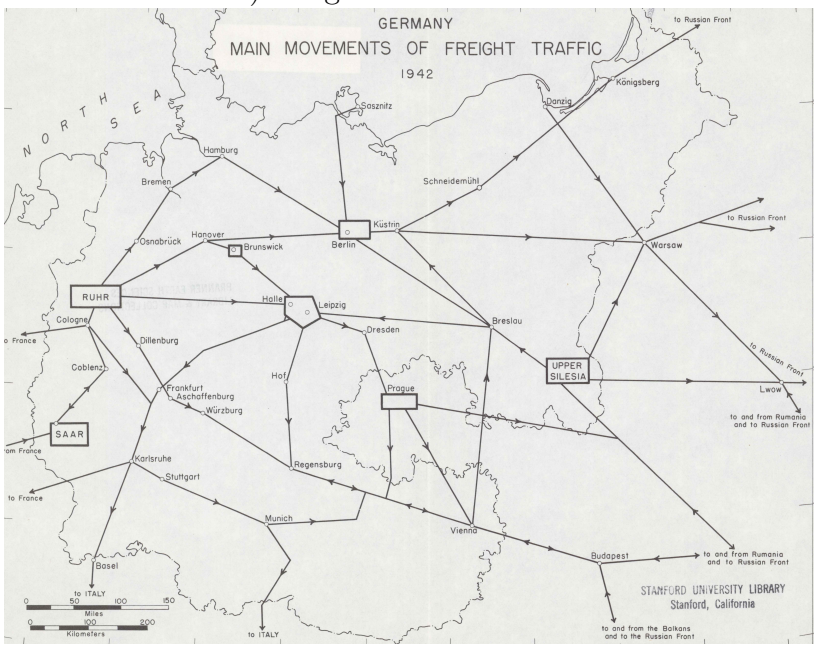
## C.7 Additional notes indirect export shock construction

FIGURE C.5: MAIN TRADE CORRIDORS IN INTERWAR GERMANY

A) Railroad network and main lines 1914




B) Freight movement 1942

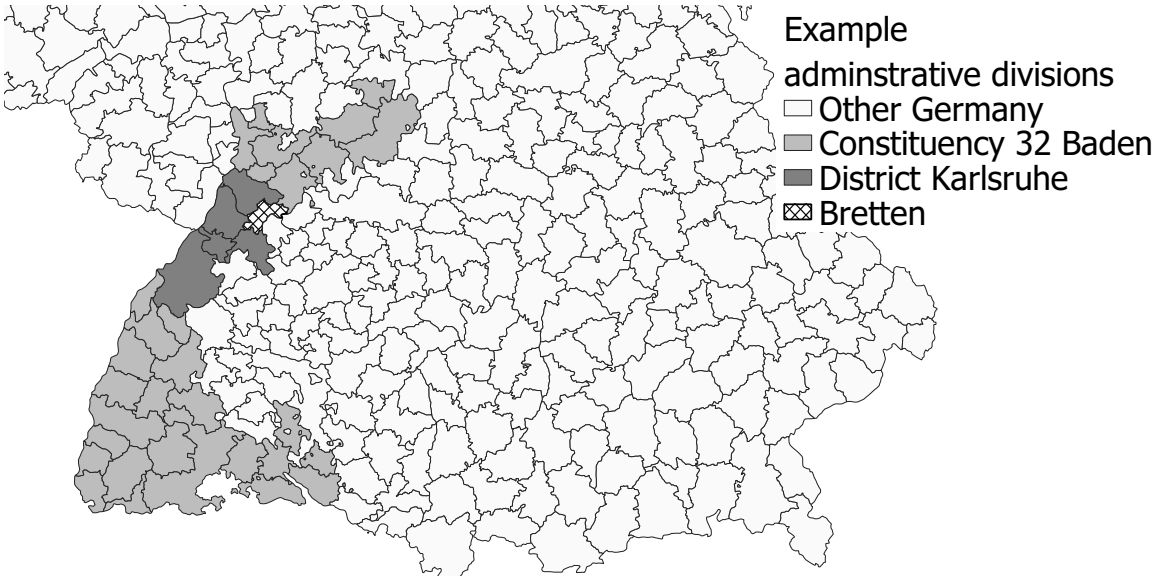



Notes: The figure depicts trade flows in Germany. Panel A depicts a map of main railroad connection and smaller connections that existed in Germany by 1914 (mr-Kathographie 1914). Panel B depicts main freight movements within and out of Germany by 1942 (US Office of Strategic Services 1942).

Appendix Figure C.5 panel A depicts the main rail-lines in 1914 used to construct our preferred gravity measure exploiting different parameters for internal trade costs (-1.3) as in Wolf (2009) along main rail-lines and (-5) as in Adao, Arkolakis & Esposito (2019) otherwise. Panel B confirms that these still reflected the main trade routes even by 1942.

Appendix Figure C.6 provides an example of how the indirect export shocks along administrative borders are constructed. It depicts the county of Bretten within the next larger administrative level district "Karlsruhe" and state "Baden" equivalent to constituency "32" and pre-WWI transport district "19".

Figure C.6: Example German administrative levels




Notes: The figure depicts an example of the construction of the indirect export shock based on higher administrative units. It shows southern Germany and the county of Bretten within the next higher administrative levels, district "Karlsruhe" and state "Baden" (corresponding to constituency "32" and transport district "19").