The Long-Run Effects of Immigration: Evidence Across a Barrier to Refugee Settlement

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Abstract

After the end of World War II in 1945, millions of refugees arrived in what in 1949 became the Federal Republic of Germany. We examine their effect on today's productivity, wages, income, rents, education, and population density at the municipality level. Our identification strategy is based on a spatial discontinuity in refugee settlement at the border between the French and US occupation zones in the South-West of post-war Germany. These occupation zones were established in 1945 and dissolved in 1949. The spatial discontinuity arose because the US zone admitted refugees during the 1945-1949 occupation period whereas the French zone restricted access. By 1950, refugee settlement had raised population density on the former US side of the 1945-1949 border significantly above density on the former French side. Before the war, there never had been significant differences in population density. The higher density on the former US side persists entirely in 2020 and coincides with higher rents as well as higher productivity, wages, and education levels. We examine whether today's economic differences across the former border are the result of the difference in refugee admission; the legacy of other policy differences between the 1945-1949 occupation zones; or the consequence of socio-economic differences predating WWII. Taken together, our results indicate that today's economic differences are the result of agglomeration effects triggered by the arrival of refugees in the former US zone. We estimate that exposure to the arrival of refugees raised income per capita by around 13% and hourly wages by around 10%.

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1 Introduction

Some 280 million people around the world are first-generation immigrants and in OECD countries, first-generation immigrants make up around 14% of the population (United Nations, 2019). The economic effects of immigration have become better understood in recent decades (Friedberg and Hunt, 1995; Card, 2001; Borjas, 2014; Peri, 2016). A new focus of research is the long-run impact on productivity and income (Hornung, 2014; Droller, 2017; Rocha et al., 2017; Burchardi et al., 2019; Sequeira et al., 2020; Peters, 2021). We contribute to this research by examining the long-run economic effects of the arrival of a large number of refugees in South-West Germany after the end of World War II (WWII) in 1945.[1] This period was characterized by one of the largest population movements in modern times. In the two years after the end of the war, millions of people from Czechoslovakia, Hungary, Poland, Romania, and eastern parts of pre-war Germany were displaced westward. When the Federal Republic of Germany was founded in 1949, these refugees made up around 15% of the country's population.[2]

Our study relies on a spatial discontinuity in refugee settlement at the border between the French and US occupation zones in the South-West of post-war Germany. These occupation zones were established in 1945 and dissolved in 1949. The origin of the spatial discontinuity in refugee settlement is well understood: while the US zone admitted refugees during the 1945-1949 occupation period, the French zone restricted access. We focus on the South-West German border between the 1945-1949 French and US occupation zones because it is the only longer border segment where municipalities on both sides ended up in the same state of the Federal Republic of Germany.

Comparing today's economic outcomes on opposite sides of the 1945-1949 occupation-zone border, we find higher productivity, wages, rents, education, and population density in municipalities on the side where refugees were admitted than on the side where access was restricted. There are several potential explanations for these differences. It may be that municipalities on opposite sides of the 1945-1949 occupation-zone border were already different before WWII and that modern economic differences are the result of these historical differences. It is also possible that today's economic differences are the legacy of differences in social and economic policies, regulations, laws, or institutions during the 1945-1949 period of French and US occupation. After examining the evidence for these and other potential explanations, we see the origin of today's differences across the 1945-1949 occupation-zone border in that the US zone admitted refugees while the French zone restricted access. By 1950, the admission of refugees had raised population density on the former US side of the 1945-1949 border 20 percentage points above density

[1] Section 2 contains a detailed discussion of the literature and our contribution.
[2] Section 3 provides more historical background.

on the former French side. The greater density on the former US side of the border persists entirely today, some 75 years after the arrival of the WWII refugees. A well-understood explanation for the persistence of greater population density—and its coincidence with higher productivity, wages, and rents—is agglomeration economies (Duranton and Puga, 2004; Rosenthal and Strange, 2004; Glaeser, 2008; Combes and Gobillon, 2015).

Our baseline analysis employs a spatial regression discontinuity design (Dell et al., 2018) at the municipality level with a narrow bandwidth around the border between the 1945-1949 French and US occupation zones in South-West Germany. We use this approach to examine whether economic outcomes depend on the side of the former border where municipalities are located. If agglomeration economies do not spill across municipality borders, the regression discontinuity design allows us to see whether today's economic outcomes across the 1945-1949 border are consistent with agglomeration economies triggered by the arrival of WWII refugees in the US occupation zone.

If agglomeration economies do, instead, spill across municipality borders (Rosenthal and Strange, 2020), what matters for today's productivity, wages, income, and rents is not just whether a municipality is located in the 1945-1949 US occupation zone admitting refugees or the 1945-1949 French zone restricting access. It also matters whether neighboring municipalities are in the former US zone or the former French zone. We therefore extend our analysis to include a wider measure of municipalities' exposure to the arrival of refugees in the 1945-1949 US occupation zone. In particular, for each municipality we measure wider exposure to refugee arrival by the share of the pre-WWII population within a certain radius around the municipality center that lived in what became the US occupation zone in 1945. We use pre-war population as this captures basic determinants of where refugees could potentially settle, but avoids endogeneity issues related to where refugees actually settled within the occupation zones. If agglomeration economies range beyond municipality borders, higher levels of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone should result in higher levels of productivity, wages, income, rents, and education today. We find this to be the case. Our estimates imply substantial long-run economic effects of the arrival of refugees. The effect on GDP per worker and income per capita today is around 13% and the effect on hourly wages is around 10%.

Once we account for wider exposure to the arrival of refugees in the 1945-1949 US occupation zone, the spatial discontinuity in productivity, wages, rents, and education today at the former border between the French and US occupation zones disappears. Put differently, our extended model indicates that the economic differences across the former border today are driven by wider exposure to the arrival of refugees in the US occupation zone, and not by the side of the border on which municipalities were located.

To examine whether municipalities across the border between the 1945-1949 French and US occupation zones were already different before WWII, we use newly digitized pre-

war census data on a range of socio-economic indicators. The data covers employment in agriculture, manufacturing, and trade; the self-employed population; the number and size of non-agricultural businesses; the number of farms; the number of houses; the value of houses as assessed by fire insurance; and the value of land and businesses for tax purposes. We find that before WWII, municipalities on opposite sides of what would become the border between the 1945-1949 French and US occupation zones were similar to one another. Furthermore, using newly digitized income data, we show that the income per capita differences we observe today across the border between the 1945-1949 French and US occupation zones did not exist before WWII; nor had there ever been significant differences in population density before the war.

While we do not find socio-economic differences predating WWII across what would become the border between the 1945-1949 French and US occupation zones in South-West Germany, the border was not placed randomly. It was determined by logistical considerations around a highway running through South-West Germany (Mosely, 1949). Entirely disregarding administrative and political divisions or the line between the territories conquered by the French and US troops during the war, the US employed its political power to expand the territory of its occupation zone southward to encompass all counties crossed by the highway (Mosely, 1949, p. 600). As a consequence, the municipalities on the former US side of the 1945-1949 border are closer on average to the South-West German highway. This could have triggered faster economic growth when road traffic started to increase rapidly in the 1950s. We examine this potential explanation for today's economic differences across the former border using a placebo strategy. Specifically, we construct placebo borders along (other) highways by replicating the rule the US used to draw its border with the French occupation zone in South-West Germany. The side of the placebo border with the highway forms the placebo-US zone and the opposite side forms the placebo-French zone. We then examine whether today's differences across the former occupation-zone border also emerge across the placebo borders. As we do not find this to be the case, we conclude that the economic differences we observe across the 1945-1949 border are not driven by the rule the US used to draw the border.

Using income data at the municipality and county level, we examine when today's economic differences across the border between the 1945-1949 French and US occupation zones in South-West Germany started to emerge. The income data at the municipality level yields that wider exposure to the arrival of refugees in the 1945-1949 US occupation zone already resulted in higher income per capita in 1980. To examine income differences before 1980, we have to employ data at the county level. During the 1954-1971 period, we observe statistically significant, faster growth in income per capita on the former US side of the 1945-1949 border. In contrast, we do not find a significant growth differential across the border during the preceding 1900-1954 period. The data also indicates that in 1954, there was no significant difference in income per capita across the 1945-1949

border. We interpret the faster growth in income per capita after 1950 on the former US side of the 1945-1949 occupation-zone border to be the result of a gradual build up of agglomeration effects.

County-level GDP estimates (Peters, 2021) confirm the finding of faster economic growth after 1950, but not before, on the former US side of the 1945-1949 occupation-zone border. Specifically, during the 1957-1970 period, GDP per capita grew significantly faster on the former US side of the former border, but there was no significant growth differential during the 1935-1950 period. Also, in 1950, there was no significant difference in GDP per capita across the former occupation-zone border in South-West Germany.

We also analyze whether today's economic differences across the border between the 1945-1949 French and US occupation zones in South-West Germany could be the result of differences in social and economic policies, regulations, laws, and institutions. Municipalities along the 1945-1949 border have been part of the Federal Republic of Germany since 1949 and of the federal state of Baden-Württemberg since 1952. They have therefore been subject to the same federal and state-level institutional framework for roughly 70 years. Before WWII, what would become the 1945-1949 border never coincided with a national or state border. We therefore focus on the potential legacy of differences related to French and US occupation between 1945 and 1949.

France, the UK, and the US cooperated in many policy areas in post-WWII Germany, even as coordination with the Soviet Union in the Allied Control Council progressively worsened. For example, the three Western occupation zones had identical tax policies from the outset (Franzen, 1994), and, in 1948, they together introduced the currency reform, merged their offices to manage foreign trade, agreed on the same food rations, and jointly entered the European Recovery Program to implement the Marshall Plan (Pünder, 1966). This policy coordination continued until 1949, when the Federal Republic of Germany was founded.

There were, however, also policy areas in which the French and US occupation zones differed. According to historical accounts, the main difference regarded the dismantling of industry structures around the end of the 1945-1949 occupation period (Pünder, 1966). The Allied forces had agreed on a plan to reduce German industrial capacity after WWII. While the UK and US diminished dismantling relative to this plan around 1948, the French occupation zone adhered to the plan more strictly. Based on detailed newly digitized lists of dismantled establishments, we confirm that there were relatively fewer dismantled establishments on the US side of the occupation-zone border in South-West Germany. However, when we control for industry dismantling at the municipality level, we find that differences in industry dismantling cannot explain today's economic differences across the 1945-1949 border. The limited economic impact of industry dismantling is furthermore supported by quantitative work in economic history comparing the UK and US occupation zones with the French occupation zone. For example, Ritschl (1985)

finds that industrial production in these occupation zones was similar at the end of the 1945-1949 occupation period when compared to pre-WWII production.

While there is no evidence that policy differences between the French and US occupation zones led to significant differences in income per capita or industrial production by the end of the occupation period in 1949, differences in policies could persist through the health or education of those born during occupation. We examine this possibility by using the German Socio-Economic Panel (SOEP) to compare children born during the occupation period to those born between 1950 and 1954. We find no significant differences in various measures of health and education between the former French and US occupation zones. Moreover, using newly digitized municipality-level data on secondary and university education in 1970, we find no evidence of spatial discontinuities at the border between the 1945-1949 French and US occupation zones in South-West Germany. It is also possible that the French and US occupation zones resulted in differences in individual attitudes and norms that persist to today. However, using the SOEP, we find no such differences in the answers to questions about the importance of different policy goals, risk preferences, interest in politics, party preferences, and unionization.

Another way to check for a broad cultural legacy of the 1945-1949 French and US occupation zones is to examine preferences for studying English or French in (upper) secondary school. The data shows no spatial discontinuity in students' course choices at the former occupation-zone border in South-West Germany.

It is also possible that US occupation during the 1945-1949 period led to persistent differences in export orientation compared to French occupation. Firms on the former US side of the former occupation-zone border might be more export oriented in general, or they could be more oriented towards trade with the US. Using information on manufacturing firms, we neither observe significant differences in overall export shares nor in the share of exports to countries outside the European Union across the former border.

Two additional explanations for today's differences across the former border between the 1945-1949 occupation zones in South-West Germany could be spatial discontinuities in war destruction or the prolonged presence of Allied military bases. Again, however, our data yields no evidence in support of these explanations.

In terms of human capital, the WWII refugees in (South-West) Germany were similar to the local population (Grosser, 2006; Bauer et al., 2013). Moreover, in 1970—more than 20 years after the arrival of the refugees—there was no spatial discontinuity in secondary or university education at the border between the 1945-1949 French and US occupation zones in South-West Germany.[3]

[3]The higher levels of university education we find today on the former US side of the 1945-1949 border appear to only have emerged after an extended period of greater population density (Glaeser and Gottlieb, 2008).

In light of these findings, we view the present-day economic differences across the border between the 1945-1949 French and US occupation zones in South-West Germany as being consistent with agglomeration economies that gradually built up following the large-scale arrival of refugees in the US zone. There is little evidence that municipalities across the 1945-1949 border were different before WWII, nor that today's economic differences across the former border are the legacy of distinct social and economic policies, regulations, laws, or institutions during the 1945-1949 period of French and US occupation (other than the US policy of admitting refugees and the French policy of restricting access).

The remainder of the paper is structured as follows. Section 2 discusses the related literature. Section 3 provides historical background. Section 4 introduces the data and the empirical framework. Section 5 presents our results on pre-WWII socio-economic characteristics, the distribution of WWII refugees, and the population density shock across the border between the 1945-1949 French and US occupation zones in South-West Germany. Section 6 discusses our findings on post-WWII outcomes across the 1945-1949 occupation-zone border. Section 7 examines alternative explanations. Section 8 concludes. Additional results are in the Appendix.

2 Related Literature

Our main contribution to the literature is an analysis of the long-run effect of immigration on productivity, wages, income, and rents using a spatial regression discontinuity design.[4] Most closely related to our work are economic studies of the consequences of the arrival of WWII refugees in Germany (Schumann, 2014; Peters, 2021); of the long-run, local effects of forced resettlements in other contexts (Sarvimäki, 2011; Murard and Sakalli, 2018; Becker et al., 2020); and of the long-run, local effects of immigration (Hornung, 2014; Droller, 2017; Rocha et al., 2017; Burchardi et al., 2019; Sequeira et al., 2020).

Schumann (2014) examines the extent to which population growth shocks associated with the arrival of WWII refugees in what would become the Federal Republic of Germany persisted to 1970. He employs a one-dimensional spatial regression discontinuity approach applied to municipalities along the same South-West German border between the 1945-1949 French and US occupation zones that we examine. Schumann finds that population growth rates between 1939 and 1950 were higher on the US side of the border and that the 1939-1950 population growth shock persisted to a large extent up until 1970 (the end

[4] Verme and Schuettler (2021) provide a meta analysis of the empirical literature on the economic impacts of forced migration on host countries. They "could not find any paper using a discontinuity design" (p. 5).

point of his analysis). He also documents that 1910-1939 population growth rates did not differ across what would become the border between the French and the US occupation zones in 1945. Our study differs in that we are interested in the long-run effect of the refugee inflow on productivity, wages, income, and rents.

Peters (2021) uses county-level data for the whole of West Germany to examine the effect of WWII refugees on population, GDP, the number of establishments, and sectoral employment shares.[5] He focuses on the period up to 1961 and primarily employs a least-squares approach with controls and state fixed effects, but also presents results up until 1970 and using an instrumental-variables strategy based on the availability of housing. Peters finds that a 10% higher population share of refugees in 1950 is associated with 5 to 7.5% higher GDP per capita growth between 1935 and 1961. In contrast, he finds no relationship between refugee settlements in 1950 and GDP per capita growth between 1935 and 1950. Based on model simulations, Peters calculates a long-run effect of the 1945-50 refugee inflow on GDP per capita of around 12% after 25 years, almost twice the effect he estimates up until 1961. His estimates applied to the 1945-1949 border between the French and US occupation zones that we examine, imply 6.3 to 9.4% higher GDP per capita in 1961 on the former US side.[6] The long-run effect that we estimate using data for the 2007-2018 period is about twice the value that Peters' estimates imply for the period up to 1961 and close to the long-run effect he simulates.

The recent literature on the economic effects of forced migration as a consequence of wars, civil conflicts, or natural disasters is surveyed in Becker and Ferrara (2019) and Verme and Schuettler (2021). Two more closely related papers focusing on local, long-run effects are Sarvimäki (2011) and Murard and Sakalli (2018). Sarvimäki studies a forced relocation program in Finland after WWII using an instrumental-variables strategy and finds positive long-run effects on wages. Murard and Sakalli study forced migration into Greece around 1920 and document positive long-run effects on education and earnings when comparing spatially contiguous municipalities with similar geographic and pre-migration features. Becker et al. (2020) examine the effect of forced relocation in Poland after WWII. They show that while there were no pre-WWII differences in education, Poles

[5] Additional works based on the arrival of WWII refugees in West Germany at the county level are Braun and Kvasnicka (2014), Wyrwich (2020), and Braun et al. (2021). Braun and Kvasnicka and Braun et al. use instrumental-variables strategies to analyze the effect of the WWII refugee inflow in Germany on, respectively, sectoral employment and population growth at the county level up to 1970. Wyrwich studies the persistence of the population shock generated by the WWII refugee inflow in Germany at the county level up to 2010 based on a difference-in-difference comparison between the French occupation zone and the combined British and US occupation zones. Somewhat less closely related is Burchardi and Hassan (2013), who examine how, after the fall of the Berlin Wall in 1989, personal relationships between WWII refugees in West Germany and East Germans affected local economic growth.

[6] We obtain this estimate by applying Peters' results to the difference in the 1950 population share of refugees across the border between the 1945-1949 French and US occupation zones in South-West Germany (12.5%).

with a family history of forced migration are more educated today than other Poles. In contrast, the second generation of the refugees arriving in (South-West) Germany during the 1945-1949 period had similar levels of education as the local population—just like the first generation (Grosser, 2006; Bauer et al., 2013). Moreover, using municipality-level data we find that in 1970, more than 20 years after the arrival of the refugees, there are no significant differences in secondary and university education across the border between the 1945-1949 French and US occupation zones in South-West Germany.

Hornung (2014), Droller (2017), Rocha et al. (2017), and Sequeira et al. (2020) study the long-run economic effects of immigration at the local level. Hornung (2014) uses an instrumental-variables strategy based on population losses during the Thirty Years' War to show that (the specialized skills of) Huguenot immigrants in Prussia in 1695 had positive effects on productivity in textile manufacturing around the year 1800. Droller (2017) and Rocha et al. (2017) find that immigrants with relatively high human capital compared to natives had a positive long-run effect on education and income in, respectively, Argentina and Brazil. Droller (2017) uses an instrumental-variables strategy based on the availability of land for settlement and the time of immigrant arrival, whereas Rocha et al. (2017) employ a panel-data approach. Sequeira et al. (2020) assess the long-run effects of the large-scale arrival of European immigrants in the US during the 1850-1920 period. Their instrumental-variables strategy is based on the interaction between aggregate immigration and the expansion of the railway network. Sequeira et al. document that counties with more immigration have higher rates of urbanization and income, less poverty, and greater educational attainment today. Their results are consistent with agglomeration economies arising from increasing returns to scale and network externalities.[7]

Finally, our study is also related to the literature on short- and medium-run effects of internal and international migration on local labor markets, see, for example, Boustan et al. (2010), Peri (2016), and Abramitzky et al. (2022).

3 Historical Background

Reorganization of Germany after WWII Towards the end of WWII, as the German defeat became apparent, the Allied powers held several conferences to plan the future of Europe. In the Yalta Conference in January 1945, the UK, the US, and the Soviet Union decided to divide Germany into four occupation zones. However, except for the Soviet zone in eastern Germany, they were unable to reach an agreement as to the location of the occupation zones. The division of Germany among the occupying forces was

[7]Somewhat less closely related is Burchardi et al. (2019), who analyze the effect of the ancestry composition of US counties on foreign direct investment using an instrumental-variables methodology based on the timing of immigration from different countries of origin.

finalized in the Potsdam Conference in the summer of 1945. The Allied forces also agreed to reverse all German annexations and to shift the eastern border of Germany westward. Appendix Figure C1, Panel A, depicts the borders of Nazi Germany just before WWII and the borders of post-WWII Germany. The striped areas mark the German territories in the east and the territories annexed by Nazi Germany. The two blue areas highlight the two historical states of Baden and of Württemberg, which form the focal area of our study. Panel B delineates the four occupation zones in post-WWII Germany.

The decisions taken in both the Yalta and Potsdam conferences were made by the UK, the US, and the Soviet Union. France had not been invited to participate. Nevertheless, the UK and the US decided to accommodate the French provisional government's demands for a French occupation zone (Willis, 1962), even though this reduced their own occupation zones since the agreed upon Soviet occupation zone had to remain unaffected (Mosely, 1949). After WWII, the US used its political power to draw the border between its occupation zone and the French occupation zone in South-West Germany. The border "was based on strictly logistical conceptions [...] so as to leave in the American zone the main highway [...]. Administrative and traditional divisions were disregarded completely" (Mosely, 1949, p. 600). The front lines conquered respectively by the French and US troops were also ignored in delineating the border. At the end of WWII, the line of contact between the French and US forces was roughly 50 km north of what would become the border between their 1945-1949 occupation zones in South-West Germany. The French combat forces had expanded their territory further northwards than stipulated by the Supreme Headquarters of the Allied Expeditionary Forces, with the intention of increasing their future occupation zone (Willis, 1962).[8] Nevertheless, the US position prevailed and the territory under its control was expanded southward to include all counties crossed by the highway through South-West Germany.[9] An often cited motive for the French demand for an occupation zone is the restoration of national pride after France had been occupied by Nazi Germany during WWII (Koop, 2005, p. 19). At the same time, the Nazi occupation had left France in a difficult economic situation. Since the provisional French government was not invited to the Potsdam Conference, it did not feel bound by the agreements made there. This became particularly apparent in the French refusal to accommodate refugees in the context of the forced population resettlements that were part of the reorganization of Germany.

[8]The fact that municipalities on both sides of the 1945-1949 border were freed by the French forces eliminates concerns about a differential effect of potential misdeeds during the military liberation period, as documented by Ochsner (2017) in Austria (see also Blumenstock, 1957).

[9]As a result, the highway fell entirely within the US occupation zone. We discuss potential economic implications of the highway in Section 5.3.

The arrival of the refugees The reorganization of Germany's boundaries was planned to be accompanied by an "orderly and humane" forced resettlement of the German and German-speaking populations living beyond the new borders of Germany to within the new borders (Potsdam, 1945). This implied a new phase of the population movements that had started during the final stages of the war. Since early 1945, with the advances of the Soviet army towards the eastern parts of pre-war Germany, the population had begun to flee westward (Kossert, 2009). Moreover, over the spring and summer of 1945, local militia and military forces expelled German-speaking people from Czechoslovakia and Poland. Including the population transfers organized by the Allied forces, a total of 12.4 million people had been displaced from the eastern parts of pre-war Germany, from Czechoslovakia, and from other countries in East and South-East Europe by the end of 1950 (Statistisches Bundesamt, 1953). 7.9 million people arrived in the territory of what would become the Federal Republic of Germany in 1949. Some refugees arrived before the occupation zones were established in the summer of 1945. Most refugees that were in the Federal Republic of Germany in 1950 had already arrived by the end of 1946.

Due to the arrival of these refugees, the population in West Germany grew by almost 20% between 1939 and 1950, despite the many fatalities in WWII. The population within the territory of the 1945-1949 US occupation zone in South-West Germany grew by 21%, mainly driven by an inflow of refugees from Czechoslovakia who made up 54% of the incoming refugees (Statistisches Bundesamt, 1955). In contrast, France restricted access to their occupation zone for refugees (Benz, 1999).

In many regards, refugees were similar to the local population. They spoke German, had similar education levels, and shared other demographic characteristics. Based on data from a supplementary German microcensus in 1971 that was conducted to study the refugees' origin and integration, Grosser (2006) shows that refugees in the US occupation zone in South-West Germany had similar education levels, pre-WWII employment, and occupational status compared to the local population.[10] On average, refugees had 8.4 years of education compared to 8.6 in the local population, and in both groups roughly 66% of the working age population were employed in 1939. The main differences between the two groups are higher shares among the refugees of people with only an elementary education and of farmers plus helping family members. This reflects the greater economic weight of agriculture in the refugees' origin regions and is consistent with the literature comparing refugees and locals more broadly.[11]

[10] We reproduce his data in Appendix Table C1.

[11] Bauer et al. (2013) examine the supplementary microcensus from 1971 for the whole of West Germany and find no differences between refugees and the local population in the pre-WWII age structure, education, employment and occupational status, and house ownership. The only difference is that a larger share of refugees was employed in the agricultural sector before WWII. Peters (2021) reports very similar findings. Based on survey data from 1982 and 1990, Schmidt (1997) shows that education,

Despite the many similarities, refugees faced substantial opposition from the local population. According to historical accounts, they were often treated as inferiors and strangers.[12] One reason for this hostility was the scarcity of housing.[13]

The 1945-1949 occupation period in West Germany The economic and social policies across the four occupation zones in post-WWII Germany were supposed to be coordinated by the Allied Control Council established in August 1945, and in some instances this worked as intended. For example, up until 1948, the four occupation zones followed a common tax policy, as agreed upon by the council (Franzen, 1994). Over time, coordination through the council deteriorated due to increasing disagreement between the Soviet Union and the Western Allies (Koop, 2005, p. 15ff.). However, the Western Allies continued to cooperate in many policy areas. In 1947, Britain and the US merged their occupation zones into the Bizone. Starting in 1948, the Bizone coordinated its policies closely with the French occupation zone. For example, in 1948, the Bizone and the French occupation zone together introduced the currency reform, merged their offices to manage the foreign trade of their occupation zones into the Joint Export Import Agency, abolished all controls at the occupation-zone borders, agreed on the same food rations, and jointly entered the European Recovery Program to implement the Marshall Plan (Pünder, 1966). The Bizone and the French occupation zone also jointly implemented a tax reform in 1948 (e.g., Franzen, 1994, p. 34). The close policy coordination among the three Western powers paved the way for the dissolution of their occupation zones and the foundation of the Federal Republic of Germany in 1949.[14]

The foundation of Baden-Württemberg In South-West Germany, the US and France had structured their occupation zones into three states during the occupation period. In the US zone, the new state of Württemberg-Baden unified the northern parts of the two historical states of Baden and Württemberg. In the French zone, the southern parts of these historical states became part of the new states of Baden and Württemberg-Hohenzollern (Matz, 2003). All three South-West German states joined the Federal Republic of Germany in 1949. There had been discussion, promoted by the Western Allies, on how to restructure the South-West German states since 1948 (Matz, 2003). It took,

employment, industry structure, and earnings of refugees and locals remained similar in later periods.

[12]For instance, Literature Nobel laureate Günter Grass, himself a refugee, describes the hostility faced by refugees in Grass (2007).

[13]Housing scarcity was the product of the large number of refugees and war destruction. In many cases, the occupying powers forced locals to host refugees. Using census data from 1950 for counties along the 1945-1949 occupation-zone border in South-West Germany, we find that 65% of refugees lived as subtenants, about 8 % lived in emergency shelters or camps, and 27% lived in normal housing.

[14]France, the UK, and the US reserved veto power and ultimate authority over sensitive policy areas in an Occupation Statute until the Bonn-Paris conventions put an official end to the Allied occupation of West Germany in 1955.

however, until April 1952 to found the federal state of Baden-Württemberg as the union of the three states in the territory of the former French and US occupation zones in South-West Germany. The delay was due to disagreement over the mode of voting on the two proposals: the restoration of the historical states of Baden and Württemberg versus a unified south-western state. The vast majority ultimately voted for a unified state, which was finally implemented in the foundation of Baden-Württemberg.

4 Data and Empirical Framework

4.1 Data

To implement our spatial regression discontinuity design, we combine data from a broad variety of sources. We highlight the key points in this section and provide a detailed overview of the variables and sources in Appendix A.

The historical data is hand-digitized from censuses at the municipality level in Baden (1871, 1895, 1903, 1930, and 1939), Württemberg (1871, 1895, 1907, and 1933), and Baden-Württemberg (1950, 1960, 1970/71). We also digitized 1980 income tax statistics at the municipality level, provided by the Statistical Office of Baden-Württemberg. At the county level, we digitized income tax statistics (1954 and 1971), sales tax revenues (1935 and 1950), and regional GDP measures (1957 and 1970). The most recent municipality-level data on productivity, income, and education comes from the online database of the Statistical Office of Baden-Württemberg. We complement the municipality-level data with micro-data from several sources. To examine value added per hour, hourly wages, and exports, we use data for the manufacturing sector provided by the German Statistical Offices. For rents, we use property-level data from the 1987 census and 2008-2016 data from the internet platform ImmobilienScout24. To examine individual health, education, norms, and attitudes of those born or living in the former French and US occupation zones, we use survey data from the German Socio-Economic Panel (SOEP). For language courses chosen in secondary school, we employ data provided by the Statistical Office of Baden-Württemberg. Additionally, we digitized municipality-level data on WWII destruction, industry dismantling after WWII, and the presence of military bases after the 1945-1949 occupation period.

All outcome data are linked to geo-data for Baden-Württemberg using historical maps provided by the House of History Baden-Württemberg and the German Federal Agency for Cartography and Geodesy. For each municipality, we obtain an indicator whether the municipality is on the former US side of the 1945-1949 occupation-zone border; longitude and latitude of the municipality center; distance to Stuttgart; distance to the closest highway exit in 1940; distance to the 1945-1949 occupation-zone border; and a list of municipalities located within a certain radius around the municipality center. All geospatial

calculations are done using QGIS. For most of the analysis, we aggregate historical data to modern municipality borders.[15]

4.2 Empirical Framework

Our empirical framework follows the spatial regression discontinuity (RD) design in Dell et al. (2018). The baseline model specification is

$$y_m = \alpha + \gamma USzone_m + f(\text{geo location}_m) + X'_m\beta + \sum_i^S seg_m^i + \varepsilon_m, \tag{1}$$

where y_m is the outcome of interest in municipality m, $USzone$ is an indicator for municipalities in the 1945-1949 US occupation zone, and $f(\text{geo location}_m)$ is the RD polynomial. In the baseline specification, the polynomial is linear in longitude and latitude. The regression model is specified as a local linear regression (Gelman and Imbens, 2019). In our sensitivity analysis, we consider alternative specifications for the functional form of the RD polynomial. We use a triangular kernel where weights decline linearly with distance to the border. The control variables X_m include quadratic functions of distance from the municipality's center to Stuttgart, the capital of Baden-Württemberg, and to the closest highway exit in 1940 of the highway crossing South-West Germany (today, the A8 highway). Depending on the model, we include further control variables. In particular, models that pool several time periods include year fixed effects. Models that are based on firm-level manufacturing data include 4-digit industry and 11 firm-size group fixed effects. Models that are based on property-level housing data include property characteristics. In our sensitivity analysis, we consider additional control variables.

In the baseline, we have five boundary segment fixed effects seg_m^i and include municipalities within a 15 km bandwidth around the border. In our sensitivity analysis, we consider different bandwidths and different numbers of boundary segment fixed effects.

The main parameter of interest in equation (1) is γ, the effect of being located on the former or the future US side rather than the French side of the border between the 1945-1949 French and US occupation zones in South-West Germany. Inference is based on Conley (1999) standard errors that allow for arbitrary correlations in the spatial dimension and, in models with several time periods, the time dimension (see also Colella et al., 2019). We implement a Bartlett-type kernel with a 25 km cutoff in the spatial

[15] Baden-Württemberg implemented a territorial reform in the early 1970s that reduced the number of municipalities from 3,379 to less than half that number. We use correspondence tables provided by the Statistical Office Baden-Württemberg to assign historical data to modern municipalities. In this process, we drop six modern municipalities because they stretch across both sides of the 1945-1949 occupation-zone border in South-West Germany and hence cannot be assigned unambiguously to either the former French or former US side.

dimension in the baseline and consider different cutoffs in our sensitivity analysis. In models with several time periods, we use a 20 year cutoff in the time dimension.

If agglomeration economies range beyond municipality borders (Rosenthal and Strange, 2020), the long-run effects of the arrival of refugees in a given municipality could spill over to neighboring municipalities—including those on the opposite side of the 1945-1949 border between the French and US occupation zones in South-West Germany. Outcomes in municipality m might therefore also depend on whether neighboring municipalities admitted refugees or restricted access during the 1945-1949 occupation period. We therefore add a wider measure of exposure to the arrival of refugees in the 1945-1949 US occupation zone in South-West Germany to the model in equation (1). The measure of wider exposure is based on the share of the 1939 population within a certain radius around municipality centers that lived on what would become the US side of the 1945-1949 occupation-zone border. We take the radius to be 10 km in the baseline and consider different radii in our sensitivity analysis. To construct the share, we first obtain all municipalities whose center is located within 10 km from the center of m. Then, we compute the sum of the population in 1939 in municipalities within the circle that would become part of the 1945-1949 US occupation zone and divide it by the total population within the circle. This yields the 1939 population share within a 10 km radius of m in what became the 1945-1949 US occupation zone.[16] We use the 1939 population as this captures basic determinants of where refugees could potentially settle, but avoids endogeneity issues related to where refugees actually settled within the US and within the French occupation zones.[17] The extended model specification is

$$y_m = \alpha + \theta USzone_m + \delta exp_m^{(10)} + f(\text{geo location}_m) + X_m'\beta + \sum_i^S seg_m^i + \varepsilon_m. \quad (2)$$

The main parameter of interest in equation (2) is δ, the effect of municipalities' wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. If agglomeration economies range beyond municipality borders, higher levels of wider exposure to the arrival of refugees in the US occupation zone should result in higher levels of productivity, wages, income, and rents today. The measure of wider exposure to the arrival of refugees in the US occupation zone in equation (2), $exp_m^{(10)}$, is obtained by subtracting 0.5 from the 1939 population share within a 10 km radius of m in what became the 1945-1949 US

[16] Appendix Figure C2 illustrates the construction and distribution of our measure of wider exposure. If the radius is taken so small that no neighboring municipality is within the circle, the population share equals to one for municipalities in the US occupation zone and to zero for municipalities in the French occupation zone. Hence, the population share becomes an indicator of the occupation zone in this case.

[17] The correlation coefficient between pre-WWII population and the number of refugees is 0.92 within the border region we focus on and 0.85 for the whole of Baden-Württemberg.

occupation zone.[18] Subtracting 0.5 (or any other number) does not affect the estimate of δ. However, it changes the interpretation of the parameter θ on the indicator $USzone$ for municipalities located in the 1945-1949 US occupation zone. This parameter now captures the effect for a (hypothetical) municipality that is on the former US side of the border, but close enough to the border that half of the 1939 population within a 10 km radius is on what became the French side of the border. As a result, θ now captures the effect of being located on the US rather than the French side of the 1945-1949 border, controlling for agglomeration economies associated with wider exposure to the arrival of refugees in the US occupation zone.

5 Refugees and Population Density, the 1945-1949 Border Before WWII, and the Role of the Highway

5.1 WWII Refugees and Population Density

In the 1950 census, WWII refugees in the Federal Republic of Germany constituted more than 15% of a total population just over 50 million. The map in Figure 1 illustrates the population share of refugees in 1950 at the municipality level in what became the state of Baden-Württemberg in 1952. The census defines refugees as individuals who in 1939 (i) resided in the territories of pre-WWII Germany to the east of the four post-WWII occupation zones or (ii) resided outside of pre-WWII Germany and were native German speakers. The map suggests a spatial discontinuity in the share of refugees in 1950 that coincides with the South-West German border between the 1945-1949 French and US occupation zones.

Table 1 quantifies the spatial discontinuity in the distribution of refugees, focusing on municipalities within 15 km of the 1945-1949 border. Of these municipalities, 102 are in the former French and 116 in the former US occupation zone. Column (1) estimates equation (1) for the population share of refugees in 1950. The estimate for the indicator $USzone$ is 0.126 and highly statistically significant. Hence, the population share of refugees in 1950 is 12.6 percentage points higher on the former US side of the 1945-1949 border. When we consider the number of refugees relative to non-refugees as the outcome variable in column (3), the ratio is 18 percentage points higher on the former US side of the 1945-1949 border. Columns (2) and (4) show the results when we add our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone in equation (2). Wider exposure to the arrival of refugees is statistically insignificant and the spatial

[18] Formally, let $d(o,m)$ denote the distance between the municipality centers of o and m in km. Then $exp_m^{(10)} = \sum_{o:\, d(o,m)\leq 10} pop39_o \times USzone_o / \sum_{o:\, d(o,m)\leq 10} pop39_o$ - 0.5.

discontinuity in the distribution of refugees at the 1945-1949 border changes little.

The arrival of WWII refugees resulted in a sizable, differential shock to population density at the border between the 1945-1949 French and US occupation zones in South-West Germany. Figure 2 illustrates the shock based on estimates using (separate regressions of) equation (1) for years between 1871 and 2020. Before WWII, there is no spatial discontinuity in population density at what became the 1945-1949 border. But starting in 1950 and up to 2020, there is a persistent discontinuity in population density at the former border—with density being around 20% larger on the former US side.[19] The differential shock to population density on the US side of the 1945-1949 border is similar in size to the discontinuity in the ratio of refugees to non-refugees in 1950 in Table 1, columns (3)-(4). The arrival of the refugees after WWII therefore accounts for the discontinuity in density that emerged in 1950.

5.2 Economic Characteristics Before WWII

That there is no spatial discontinuity in population density before WWII at what became the border between the 1945-1949 French and US occupation zones in South-West Germany suggests that municipalities across the border were similarly attractive places to live. We now examine additional socio-economic indicators for spatial discontinuities before WWII at the 1945-1949 border.

A standard measure of historical economic development available in municipality censuses for the period around 1900 and for the period just before WWII is the sectoral production structure.[20] Figure 3 shows our results based on estimating equation (1). We observe no spatial discontinuity at what became the 1945-1949 occupation-zone border in the share of manufacturing in total employment in manufacturing and agriculture. Nor is there a spatial discontinuity in the share of manufacturing & trade in total employment in manufacturing, trade, and agriculture.

We also examine several indicators of income and wealth from municipality censuses for the period around 1900 and for the period just before WWII. In particular, we digitized data on taxable income per capita in 1895/1907; houses per capita in 1903/1908; house values in 1903/1908 as assessed by fire insurance; and the value of land and businesses for tax purposes in 1930/1933.[21] None of these indicators reveal spatial discontinuities

[19] The increase in population density between 1939 and 1950 is consistent with Schumann's (2014) finding that population growth during the 1939-1950 period was about 20 percentage point higher on the US side of the 1945-1949 border.

[20] As described in Appendix A, some variables are measured in different years in Baden and in Württemberg. For example, the sectoral production structure in Baden for the period around 1900 is available for 1895 and in Württemberg for 1907. In these cases, our regressions include a dummy variable which is equal to one for municipalities in Baden.

[21] The value of land and businesses for tax purposes refers to official valuations by the tax authorities

at what would become the border between the 1945-1949 French and US occupation zones in South-West Germany. Neither is there any spatial discontinuity at what would become the occupation-zone border in the share of self-employed workers or the number of farms per capita. The only statistically significant pre-WWII difference across the 1945-1949 border that we find is a smaller number of non-agricultural businesses per capita in 1933/39 on what would become the US side of the border.

Taken together, the evidence in Figure 3 suggests that there were no significant economic differences before WWII across what became the border between the 1945-1949 French and US occupation zones in South-West Germany. Furthermore, the figure shows that at the end of WWII in 1945, there was no spatial discontinuity in the percentage of housing or industrial structures destroyed during the war.

5.3 Examining the Effect of Highways

As explained in Section 3, the location of the border between the 1945-1949 French and US occupation zones in South-West Germany was determined by the highway crossing South-West Germany (today, the A8 highway). After WWII, the US employed its political power to expand its territory southward to include all counties crossed by the highway. Panel (a) of Figure 4 shows the border and the A8 highway in Baden-Württemberg. As a consequence of this border delineation, municipalities on the US side of the border were on average closer to the highway than those on the French side.

Before and shortly after WWII, there was little road traffic. In the 1950s, however, traffic increased rapidly. This could have triggered faster population and productivity growth in municipalities closer to the A8 highway. As a result, the highway may explain long-run differences across the South-West German border between the French and US occupation zones.

One way to account for the role of the A8 highway is to control for the distance of municipalities to the highway (Schumann, 2014). In addition, we examine the role of the A8 highway using a placebo strategy. In a first step, we construct a placebo-US occupation zone along any highway by replicating the US rule that all historical counties crossed by the highway should be part of the US occupation zone. Second, we construct a placebo-French occupation zone. As any band of counties crossed by a highway has two outer borders—one on either side of the band—there are generally two choices for the placebo-French occupation zone (and the placebo border). Third, we examine differences across the borders between the placebo occupation zones using equations (1)-(2). Our baseline includes municipalities within 15 km of the placebo borders. We implement this

that are used as a tax base.

placebo strategy for the A5, A6, A7, A8, and A81 highways in Baden-Württemberg.[22] Except for the A8, these highways were all constructed or completed after WWII. We therefore also implement the placebo strategy for the segment of the A8 highway that runs through the federal state of Bavaria, which neighbors Baden-Württemberg to the west and was occupied by the US.[23] This highway segment is as old as the one in Baden-Württemberg and was located entirely within the 1945-1949 US occupation zone. The placebo-US occupation zone in Bavaria along the A8 highway again replicates the US rule that all historical counties crossed by the highway should be part of the US occupation zone. As the band of counties crossed by the A8 highway has two outer borders, there are two possibilities for the placebo-French occupation zone (and the placebo border). Panel (b) of Figure 4 illustrates the Bavarian placebo when we place the placebo-French occupation zone to the south of the placebo-US occupation zone (and to the south of the A8 highway).

Figure 5 shows the results of applying our placebo strategy to examine (log) population growth between 1939 and the year indicated on the horizontal axis using equation (1). Our goal is to see whether there are statistically significant differences in population growth across placebo borders and, in particular, whether population growth tends to be significantly larger on the side of the placebo borders that encompasses the highway (i.e., the placebo-US occupation zone). The estimates in red are those for the placebo borders. For comparison, the estimates in blue show the results for the actual border between the 1945-1949 French and US occupation zones. No time period after 1939 and no set of placebo borders yields a statistically significant difference for population growth across our placebo borders. This holds true whether we pool the placebo borders for all highways in Baden-Württemberg; whether we pool the two placebo borders for the highway A8 in Bavaria; whether we pool the three placebo borders for the highway A8 in Baden-Württemberg and Bavaria;[24] or whether we only consider the placebo for the A8 highway in Bavaria where the placebo-French occupation zone is to the south of the placebo-US occupation zone. These results indicate that the spatial discontinuity in

[22]The A6 highway runs east to west within what was the 1945-1949 US occupation zone. The other highways run north to south and cut nearly perpendicularly across what was the border between the 1945-1949 French and US occupation zones. We can only place one placebo border along the A5 highway (west of the highway) as this highway runs close to the border with France. Similarly, we can only place one placebo border along the A7 highway (east of the highway) as it runs close to the border with the state of Bavaria. We can also only place one placebo border along the A8 highway (north of the highway) as the border south of that highway is the actual 1945-1949 border between the French and US occupation zones in South-West Germany. Of the 225 municipalities within 15 km of this placebo border (108 in the placebo-French zone and 117 in the placebo-US zone), 218 were in the 1945-1949 US occupation zone.

[23]Except for a county far off the A8 highway.

[24]We can only place one placebo border along the A8 highway in Baden-Württemberg (north of the highway) as the border south of that highway is the actual 1945-1949 border between the French and US occupation zones in South-West Germany.

population growth at the border between the 1945-1949 French and US occupation zones in South-West Germany is not due to the rule the US used to draw the border.

6 Economic Outcomes Across the 1945-1949 Border After WWII

6.1 Economic Outcomes in the Long Run

Tables 2 and 3 contain our main results for long-run differences in income, productivity, wages, rents, and education in municipalities across the border between the 1945-1949 French and US occupation zones in South-West Germany. The estimating equations are (1)-(2). Our sensitivity analysis is in Appendix B.

Income per capita Table 2, Panel A contains our results for (log) income per capita from municipality-level tax statistics. Column (1) contains the results of estimating equation (1) for the 2007-2017 period. The indicator $USzone$ for municipalities located in the 1945-1949 US occupation zone has a small and statistically insignificant effect. Hence, there is no evidence of a spatial discontinuity in income per capita at the border between the 1945-1949 French and US occupation zones in South-West Germany. Column (2) contains the estimates of equation (2) for the 2007-2017 period. The new explanatory variable is $exp_m^{(10)}$, our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. As explained in Section 4.2, this measure is obtained by subtracting 0.5 from the 1939 population share within 10 km of m in what became the 1945-1949 US occupation zone. Subtracting 0.5 implies that the indicator $USzone$ now captures the effect for a (hypothetical) municipality that is located in the 1945-1949 US occupation zone but close enough to the border that half of the 1939 population within 10 km is in the 1945-1949 French occupation zone. The results in column (2) indicate that wider exposure to the arrival of refugees in the 1945-1949 US occupation zone has a significantly positive effect on income per capita. The indicator $USzone$ continues to have a small and statistically insignificant effect on income per capita. Hence, there is no spatial discontinuity in income per capita at the 1945-1949 border even when we control for wider exposure to the arrival of refugees. The point estimate on wider exposure to the arrival of refugees in the 1945-1949 US occupation zone (0.139) indicates that a municipality surrounded by municipalities in the 1945-1949 US occupation zone has 13.9% higher income per capita today than a municipality surrounded by municipalities in the French occupation zone.

To understand when today's income differences across the border between the 1945-1949 French and US occupation zones started to emerge, we draw on municipality-level income tax statistics for 1980. Columns (3)-(4) show that results for income per capita in

1980 are qualitatively and quantitatively similar to those we obtained for the 2007-2017 period. Thus, the modern income effects along the 1945-1949 border appear to have already been in place in 1980.

Our results for income per capita today and in 1980 could potentially reflect spatial income patterns rooted in history. Columns (5)-(6) examine this possibility using income per capita from municipality-level income tax statistics for around 1900.[25] We do not observe a spatial discontinuity along what would become the border between the 1945-1949 French and US occupation zones. Nor is there a statistically significant effect of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. Hence, there is no evidence that our results for the period since 1980 reflect spatial income patterns rooted in history.

Aggregate productivity Table 2, Panel B contains our results for (log) aggregate productivity at the municipality level in 2007-2018. Aggregate productivity is measured as the (taxable) sales of goods and services per worker of all active firms in a municipality. The result in column (1) shows a significant spatial discontinuity at the border between the 1945-1949 French and US occupation zones. The estimate (0.13) implies that aggregate productivity is 13% higher on the former US than the former French side of the 1945-1949 border between the occupation zones in South-West Germany. Column (2) augments the specification with our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. This yields two main results. First, wider exposure to the arrival of refugees has a significantly positive effect on aggregate productivity. Second, once we account for municipalities' wider exposure to the arrival of refugees, the difference in aggregate productivity at the 1945-1949 border drops by around 60% and is no longer statistically significant. Hence, when we take into account that agglomeration economies range beyond municipality borders (Rosenthal and Strange, 2020), the former occupation zone where the municipality is located loses statistical significance as a determinant of aggregate productivity. The magnitude of the effect of wider exposure to the arrival of refugees in the US occupation zone indicates that a municipality surrounded by municipalities on the former US side of the 1945-1949 border has 27% higher aggregate productivity today than a municipality surrounded by municipalities on the former French side. Assuming a share of intermediate inputs and services of 50% (the value for Germany in 2020 according to Statistisches Bundesamt, 2021), implies an effect for value added per worker of 13.5%, similar to the one obtained for income per capita.

[25] The data comes from the 1895 municipality census in Baden and the 1907 municipality census in Württemberg, the only pre-WWII income data available at the municipality or county level.

Rents Table 2, Panel C contains our results for (log) rents. Columns (1)-(2) examine rental prices offered in 2008-2016 on ImmobilienScout24—Germany's largest rental website with a market share of about 50%—controlling for a range of property characteristics listed in Appendix A1. The result in column (1) shows a significant spatial discontinuity at the border between the 1945-1949 French and US occupation zones. Rents are 12% higher on the former US than French side. Column (2) adds our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. Wider exposure to the arrival of refugees has a significantly positive effect on rents. The point estimate indicates that a municipality surrounded by municipalities on the former US side of the 1945-1949 border has 23.2% higher rents today than a municipality surrounded by municipalities on the former French side. Once we account for municipalities' wider exposure to the arrival of refugees in the US occupation zone, the difference in rents at the 1945-1949 border diminishes and the side of the former border where the municipality is located is no longer a statistically significant determinant of rents.

Columns (3)-(4) contain our results for rental prices from the 1987 census. We focus on properties rented between 1985 and 1987, excluding social housing and controlling for a range of property characteristics listed in Appendix A1. The results are qualitatively the same as those obtained for the 2008-2016 period, but the magnitudes are about 1/3 smaller. Columns (5)-(6) contain our results for average rental prices at the municipality level, not adjusted for property characteristics, from the 1970/71 census.[26] Results are qualitatively similar as when using detailed rental price data for more recent periods, though the magnitudes are smaller than in 1987 and the effect of wider exposure is statistically insignificant.

Education Table 2, Panel D contains our results for university education at the municipality level. Columns (1)-(2) examine university education in 1999-2020. The result in column (1) shows a spatial discontinuity at the border between the 1945-1949 French and US occupation zones. The share of workers with a university education is 1.3% higher on the former US than French side. Column (2) adds our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. Wider exposure has a significantly positive effect on university education. The point estimate indicates that the share of workers with a university education in a municipality surrounded by municipalities on the former US side of the border between 1945-1949 occupation zones is 4.9% higher today than in a municipality surrounded by municipalities on the former French side. The difference in university education at the former border becomes smaller and is no longer statistically significant once we account for municipalities' wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. Columns (3)-(4) contain our

[26] There is no data available at the individual property level.

results for university education in 1989-1999. The results are qualitatively the same as for 1999-2020, but the magnitudes are smaller.

Columns (5)-(6) contain our results for the share of the population with a university education in 1970. There is no evidence of a spatial discontinuity at the border between the 1945-1949 French and US occupation zones. Nor is there a statistically significant effect of wider exposure to the arrival of refugees in the US occupation zone.

Wages and value added in manufacturing Table 2, Panel E contains our results for (log) hourly wages at the municipality level. The data comes from a representative firm-level survey that covers 45% of manufacturing firms with at least 20 employees between 1995 and 2012. As we want to capture wages at the municipality level and the data includes firms with establishments in multiple municipalities, we focus on firms with a single establishment.

The result in column (1) shows a spatial discontinuity in hourly wages at the border between the 1945-1949 French and US occupation zones. The specification controls for 4-digit industry fixed effects and 11 firm-size group fixed effects. Hourly wages are 7.6% higher on the former US than French side. Column (2) augments the specification with our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. Wider exposure to the arrival of refugees has a significantly positive effect on wages. A municipality surrounded by municipalities on the former US side of the 1945-1949 border has 10.5% higher wages than a municipality surrounded by municipalities on the former French side. Once we account for wider exposure to the arrival of refugees in the US occupation zone, the difference in wages at the 1945-1949 border drops and is no longer statistically significant.

The manufacturing survey also provides data on the value added of the firms we examined in columns (1)-(2). Columns (3)-(4) use this data to analyze differences in (log) value added per hour across the border between the 1945-1949 French and US occupation zones. The result in column (3) shows a statistically insignificant difference across the border. In column (4), we find that wider exposure to the arrival of refugees in the 1945-1949 US occupation zone has a significantly positive effect on value added per hour. The magnitude of the effect of wider exposure indicates that a municipality surrounded by municipalities on the former US side of the border between 1945-1949 occupation zones has 26.7% higher value added per hour in manufacturing today than a municipality surrounded by municipalities on the former French side.

Overall, the results in Table 2 paint a consistent picture. Using our baseline specification, we find spatial discontinuities at the border between the 1945-1949 French and the US occupation zone. In particular, aggregate productivity, hourly wages in manufacturing, rents, and the share of workers with university education are higher on the former

US side of the border. However, these effects at the former border turn statistically insignificant once we account for wider exposure to the arrival of refugees in the US occupation zone. Put differently, when we take into account that agglomeration economies range beyond municipality borders, the former occupation zone where the municipality is located loses statistical significance as a determinant of productivity, wages, rents, and university education across the former border. At the same time, wider exposure to the arrival of refugees in the US occupation zone has a significantly positive effect on income per capita, productivity, hourly wages and value added per hour in manufacturing, rents, and the share of workers with a university education.

Sensitivity analysis Appendix B shows that the long-run effects on productivity, income, rents, and education we find are not driven by particular choices regarding the bandwidth around the border, the structure of the error terms, the functional form of the RD polynomial, or the number of boundary segment fixed effects. We also document that the relationship between wider exposure to the arrival of refugees in the 1945-1949 US occupation zone and income, productivity, rents, and education remains positive and significant if we additionally control for each municipality's distance to the 1945-1949 border. In this specification, we implicitly compare municipalities with the same distance to the former border and exploit variation in wider exposure to the arrival of refugees in the US occupation zone induced by the irregular shape of the border. Finally, we vary the radius of the circle used to define our measure of wider exposure to the arrival of refugees in the US occupation zone. We find that the magnitude of the coefficient on wider exposure in equation (2) follows an inverse u-shape. The largest coefficient is found for a radius around 10 km. We provide simulation evidence that an inverse u-shape with a maximum at 10 km would be expected if the true data-generating process involves spillover effects over a 10 km range.

Highway placebos Table 3 examines the most recent economic outcomes in Table 2 across placebo borders drawn along highways in Baden-Württemberg and Bavaria. As explained in Section 5.3, the placebo borders replicate the rule used by the US to draw its border with the French occupation zone in South-West Germany. The table contains results pooling all placebo borders along highways in Baden-Württemberg; results pooling the three placebo borders along the A8 highway in Baden-Württemberg and Bavaria; results pooling the two placebo borders along the A8 highway in Bavaria; and results for the placebo border along the A8 highway in Bavaria where the placebo-French occupation zone is to the south of the placebo-US occupation zone. For aggregate productivity, we only present results for Baden-Württemberg as the variable is not available for Bavaria.

The results in Table 3 continue to be based on estimating equations (1)-(2). The indicator variable now captures municipalities in the placebo-US occupation zone (the side

of the placebo border encompassing the highway). The economic differences we find across the border between the 1945-1949 French and US occupation zones are generally not present across the analogously drawn placebo borders. Of the 21 estimates for economic differences at the placebo borders using our baseline specification (1), only one indicates a positive and statistically significant effect on the placebo-US side of the placebo border. Using our extended model in (2), results are even stronger. Of the 21 estimates for the effect of wider exposure to the arrival of refugees in the placebo-US occupation zone, none is statistically significant.

6.2 The Adjustment Process Before 1970

Municipality-level data on income per capita is only available for around the year 1900 and after 1980. The income data that is available in between these years comes from county-level income tax statistics for the 1954-1971 period. We use this data to estimate equation (1) for counties with at least one municipality within 15 km of the border between the 1945-1949 French and US occupation zones in South-West Germany (20 counties). $USzone$ now indicates historical counties located in the 1945-1949 US occupation zone. All the relevant distances for a county are calculated based on population-weighted averages of the coordinates of municipalities in the county. The results in Table 4, Panel A show our estimates for the $USzone$ indicator. According to column (1), annual income per capita growth between around 1900 and 1954 was similar across the border between the 1945-1949 French and US occupation zones. However, as shown in column (2), between 1954 and 1971, income per capita grew significantly faster on the former US side. The difference in 1954-1971 annual income per capita growth between the former US and the former French side of the border is 1.1%. Over the 1954-1971 period, this implies 18 percent higher income per capita on the former US side, about the same magnitude as the effect we obtain at the municipality level in 1980 (Table 2, Panel A). In column (3), we consider differences in the (log) level of income per capita in 1954 across the border between the 1945-1949 French and US occupation zones. The point estimate is small and statistically insignificant. Somewhat unsurprisingly, standard errors for the (log) level specification at the county level are large.

Table 4, Panel B asks similar questions as Panel A using county-level GDP data or GDP proxies also employed in Peters (2021). In column (1), we examine annual GDP per capita growth between 1935 and 1950 across the border between the 1945-1949 French and US occupation zones. GDP is proxied based on value-added taxes. We find that growth rates across the 1945-1949 border were similar before 1950. Column (2) examines annual GDP per capita growth between 1957 and 1970. Growth on the former US side of the 1945-1949 border is 1% higher and the effect is statistically significant. In column (3), we consider differences in the (log) level of GDP per capita in 1950 across the 1945-

1949 border. The point estimate is small and statistically insignificant (as in Panel A, standard errors are large). The results in Panels A and B suggest that the former US side of the 1945-1949 border did not have higher income or GDP per capita immediately following the 1945-1949 occupation period. Differences in income and GDP per capita across the 1945-1949 border appear to have emerged gradually after 1950.

Table 4, Panel C uses municipality-level population statistics to provide evidence that the US occupation zone was not a more attractive place to live immediately following the 1945-1949 occupation period. In column (1) we look at population adjustments across the border between the 1945-1949 French and US occupation zones just after the occupation period. We combine population in 1950 with data on the average annual change in population between the start of 1949 and the end of 1951 (Statistisches Landesamt Baden-Württemberg, 1952) in order to compute a proxy for population growth between 1949 and 1951.[27] The result in column (1) indicates that between 1949 and 1951, the population grew about 5% slower on the former US side of the 1945-1949 border. We see this as consistent with the idea that due to the arrival of refugees in the US zone, housing conditions were relatively crowded compared to the French zone at the end of the occupation period and this disadvantage was not compensated for by higher incomes.

In Panel C, column (2), we examine annual population growth between 1950 and 1960. Population growth over this period was similar across the border between the 1945-1949 French and US occupation zones. This suggests that, overall, living conditions between 1950 and 1960 were similar across the 1945-1949 border. This view seems confirmed in column (3), where we examine the settlement of refugees from the German Democratic Republic, founded in 1949 in the Soviet occupation zone, along the 1945-1949 border.[28] In contrast to what would be expected if the former US occupation zone was a more attractive place to live than the former French occupation zone, there is no spatial discontinuity in refugee settlement at the former border in 1960.

Table 4, Panel D examines annual changes in the manufacturing employment share across the border between the 1945-1949 French and US occupation zones. Column (1) looks at the period from before WWII to 1950. Manufacturing grew significantly faster on the former US side of the 1945-1949 border. This is consistent with the observation made by economic historians that few WWII refugees in Germany ended up being employed in agriculture, even among those who had worked in agriculture prior to WWII (Grosser, 2006). However, as can be seen in column (2), in the 1950s it was the former French side of

[27] As we know only the average annual change in population of municipalities between the start of 1949 and the end of 1951 (not the value for each year) and population levels in 1950, we cannot calculate exact population growth between the start of 1949 and the end of 1951.

[28] Estimates of the total number of refugees from the German Democratic Republic to the Federal Republic of Germany vary between 3.1 and 3.6 millions (Benz, 1999).

the 1945-1949 border that experienced significantly faster manufacturing growth.[29] This stands in contrast to what would be expected if by the end of the 1945-1949 occupation period, the former French zone had become a less efficient place for manufacturing than the former US zone. Column (3) shows that between 1960 and 1970, the difference in manufacturing growth across the former border is statistically insignificant.

Overall, our analysis of the adjustment processes suggests that today's differences in income per capita across the border between the 1945-1949 French and US occupation zones in South-West Germany were to some extent already present in 1970. Moreover, these differences appear to have gradually built up after 1950. There is no evidence indicating that differences in income across the 1945-1949 border emerged between the period prior to WWII and the end of the 1945-1949 occupation period.

7 Alternative Explanations

Our analysis in Section 5.2 and Figure 3 indicates that prior to WWII, municipalities on opposite sides of the border between the 1945-1949 French and US occupation zones had similar socio-economic characteristics. Moreover, the 1945-1949 border did not coincide with a national or state border before WWII, and municipalities along the 1945-1949 border have been part of the Federal Republic of Germany since 1949 and the state of Baden-Württemberg since 1952. Our examination of potential alternative explanations for today's economic differences across the 1945-1949 occupation-zone border therefore focuses on the potential legacy of differences that might have emerged during the 1945-1949 period of French and US military occupation.

As described in Section 3, the three Western occupying powers coordinated on a range of policies and jointly implemented the central economic reforms of 1948. Nevertheless, there were areas where policy in the French and US occupation zones diverged. We now consider various differences between the 1945-1949 French and US occupation zones and examine whether these might play a role for today's economic differences across the 1945-1949 occupation-zone border in South-West Germany.

Industry dismantling According to historical accounts, the main difference between the policies in the 1945-1949 French occupation zone and the US occupation zone (or Bizone since 1947) regarded the dismantling of industry structures around the end of the occupation period (e.g., Pünder, 1966, p. 246). To examine the extent and any long-run effects of industry dismantling across the border between the 1945-1949 French and US occupation zones in South-West Germany, we link detailed digitized lists of dismantled

[29] The results do not change when we control for industry dismantling, see Appendix Table C3.

establishments (Reichelt, 1947; Harmssen, 1951) to the municipality level. Table 5, Panel A shows our results for the share of dismantled establishments across the 1945-1949 border using estimating equations (1)-(2). In column (1), we find that the share of dismantled establishments at the 1945-1949 border was 0.11 percentage points lower on the US side. This difference is statistically significant, confirming that—even comparing municipalities close to the 1945-1949 border—there were fewer dismantled establishments in the US than the French zone. In column (2), we control for wider exposure to the arrival of refugees in the US occupation zone. We find no statistically significant effect of wider exposure to the arrival of refugees on industry dismantling. This stands in contrast to the significantly positive effect of wider exposure to the arrival of refugees on income, productivity, rents, wages, value added, and education in Table 2. We see this as a first piece of evidence that industry dismantling cannot explain the economic patterns today across the 1945-1949 border. Moreover, we examine the long-run economic effects of industry dismantling by including the share of dismantled establishment at the municipality level as an additional control variable in the regressions of Table 2. Our results remain unchanged and the control for industry dismantling is mostly statistically insignificant (see Appendix B).

The finding that industry dismantling cannot account for today's economic differences across the border between the 1945-1949 French and US occupation zones in South-West Germany is in line with the quantitative literature on the economic history of the 1945-1949 occupation of Germany by France, the UK, and the US. Manz (1968) documents a small impact of industry dismantling on the aggregate capital stock in 1948 in the French occupation zone, as well as in the French, British, and US occupation zones taken together. Ritschl (1985) observes that in the summer of 1949, total industrial production in the, by then, former British-American Bizone was only a few percentage points closer to industrial production levels in 1936 than in the former French occupation zone.[30] Moreover, our results in Table 4 indicate that counties across the border between the 1945-1949 French and US occupation zones in South-West Germany had similar income per capita in the years after the occupation period.

Military bases after 1949 Another potential explanation for today's economic differences across the border between the 1945-1949 French and US occupation zones in

[30]We reproduce the figure for industrial production in Ritschl (1985) in the left panel of Appendix Figure C3. It can be seen that in July 1949, the Bizone is only a few percentage points closer to industrial production levels in 1936 than the French occupation zone. The right panel makes an (imperfect) adjustment for differences in the number of workers using data on employment in industry and handicrafts from Vonyó (2018). This adjustment is potentially important because the arrival of refugees in the 1945-1949 US occupation zone led to faster employment growth in the US than in the French occupation zone. The adjustment is imperfect in that pre-WWII employment in Vonyó (2018) is for 1939 and post-WWII employment is for 1950. As can be seen in the right panel of Appendix Figure C3, after the employment adjustments, it is the French zone that is a few percentage points closer to industrial productivity in 1936 than the Bizone.

South-West Germany is the prolonged presence of Allied military bases after the occupation period. To examine this possibility we construct an indicator that captures whether a municipality hosted a French or US military base following the 1945-1949 occupation period. In Table 5, Panel A, columns (3)-(4), we see no significant difference in this indicator variable at the 1945-1949 border. Nor is there a statistically significant link between the prolonged presence of Allied military bases and wider exposure to the arrival of refugees in the 1945-1949 US occupation zone.

Trade The 1945-1949 French and US occupation zones in South-West Germany might have sparked persistent economic effects through the export orientation of firms. Specifically, firms in the former US occupation zone might be more export oriented than those in the former French occupation zone. They might also be more oriented towards trade with the US, while firms in the former French occupation zone might be more oriented towards trade with France. Table 5, Panel B examines this possibility using detailed export data for the manufacturing firms in Table 2. There are no statistically significant differences today in export revenues at the 1945-1949 border, whether we look at the ratio of international revenue to total revenue or the ratio of non-EU revenue to total revenue. Nor is there a statistically significant link between overall exports or EU exports and wider exposure to the arrival of refugees in the 1945-1949 US occupation zone.

Headquarters and establishment/firm size We also examine whether manufacturing establishments on the former US side of the border between the 1945-1949 French and US occupation zones in South-West Germany are more likely to be located in the same municipality as their firm's headquarters. The data comes from the firm-level survey already used in Table 2. Table 5, Panel C indicates that there is no statistically significant difference in establishment-headquarter co-location at the 1945-1949 border. In Panel D, we look at the size of all establishments and firms in municipalities along the 1945-1949 border. Again, there are no statistically significant differences at the border. We also find that there is no statistically significant link between establishment-headquarter co-location or firm/establishments size and wider exposure to the arrival of refugees in the 1945-1949 US occupation zone.

Language preferences We also examine whether the 1945-1949 French and US occupation zones have left a trace in today's preferences for learning English or French in school. Our analysis is based on the share of students who, between 2005 and 2019, chose English rather than French as their first foreign language in all secondary schools along the border between the 1945-1949 French and US occupation zones in Baden-Württemberg. Secondary schools in Baden-Württemberg generally offer both options. As can be seen in Table 5, Panel E, we find no statistically significant differences at the 1945-1949

border. We also use information on all upper-secondary school students along the former border who chose advanced English or advanced French courses. These courses provide advanced language training and teach the literature and history of, respectively, English- and French-speaking countries. Again, we do not find any significant differences at the 1945-1949 occupation-zone border. We interpret these results as indicating that there are no significant differences in the broader cultural legacy of the French and US occupation zones across the former border between the occupation zones in South-West Germany. We also find that there is no statistically significant link between the preference for English courses in (upper) secondary school and wider exposure to the arrival of refugees in the 1945-1949 US occupation zone.

Taxes at the municipality level The three Western powers in Germany adopted the same main tax policies throughout the 1945-1949 occupation period (Franzen, 1994).[31] This was also true for the laws governing municipal taxation, which were not changed during the occupation period. As a consequence, municipalities in the Western occupation zones continued to set their own tax rates on businesses and on agricultural and non-agricultural land. This is still the case today. It is therefore possible that differences between the French and US occupation zones have persistent economic effects today through municipal tax rates. We examine this possibility using data on business tax rates and tax rates on land in 1950, 1960, and 1970 for municipalities along the 1945-1949 border.[32] For business tax rates, we never find any statistically significant differences across the 1945-1949 border, see Appendix Table C4. For tax rates on land, we find that these were lower on the former US than the former French side of the 1945-1949 border in 1950. However, in 1960, there were no longer any statistically significant differences, and in 1970, the tax rate on non-agricultural land was actually somewhat higher on the former US side of the 1945-1949 border.

Health and education Differences in social or economic policies between the 1945-1949 French and US occupation zones might have persistent economic effects through the health or education of those born during the occupation period. An example of such a policy difference that could have triggered long-lasting effects is the size of official food rations, which was smaller in the French occupation zone in 1946 and 1947.[33] We

[31]There were some differences in new, minor taxes introduced by the state legislatures in the three Western occupation zones, see Franzen (1994).

[32]These tax rates are customarily expressed as multiples of a state-wide base rate.

[33]We reproduce the available data in Figure C4. Note that this data represents official food rations, not the amount of food that was available to the population. The evidence in Kesternich et al. (2015) suggests that this distinction matters. Using the Survey of Health, Ageing and Retirement in Europe (SHARE), they find no significant difference in self-reported hunger between the 1945-1949 French and US occupation zones, whether or not they control for the official caloric intake. A potential explanation is

examine the possibility that differences across occupation zones affected long-run health outcomes using the German Socio-Economic Panel (SOEP). We consider differences in body weight, body height, physical health, and mental health between individuals born during the occupation period (1945-1949) and those born afterwards (1950-1954), and examine whether the magnitude of the difference depends on whether individuals were born in the 1945-1949 French or US occupation zone.[34] The first four columns of Table 6, Panel A, show that there are no significant differences between individuals born in the 1945-1949 French and US occupation zones. The SOEP also allows us to compare the educational attainment of those born or educated during and after the 1945-1949 occupation period. Again, there are no significant differences across occupation zones, see Table 6, column (5).[35]

Norms and attitudes The 1945-1949 French and US occupation zones might have led to persistent differences in attitudes and norms. We again use individual-level data from the SOEP to investigate this possibility. Table 6, Panel B shows our estimates for individuals who at the time of the survey had lived in Baden-Württemberg for at least five years. We find no statistically significant differences in general interest in politics or the leaning towards a specific party between the 1945-1949 French and US occupation zones. The SOEP also asks individuals whether there is a union (work council) that represents workers in the establishment where they are employed. There is no significant difference between the 1945-1949 occupation zones. Another SOEP question of interest concerns the extent to which individuals are willing to take risks. Again, there is no significant difference between the 1945-1949 occupation zones. Finally, answers do not differ significantly between the 1945-1949 French and US occupation zones when individuals are asked whether the most important policy objective should be protecting the right to free speech; fighting against inflation; increasing citizen influence on government decisions; or maintaining peace and order in the country.

8 Conclusion

The settlement of millions of WWII refugees in what in 1949 would become the Federal Republic of Germany was shaped by the French policy of restricting access to its occupa-

that the actual availability of food depended on local agricultural conditions. In this case, the availability of food might not differ significantly in narrowly defined local areas, such as the one we focus on here.

[34] To ensure a large enough sample in the relevant age ranges we look at French and US occupation zones in Baden-Württemberg and three bordering states—Bavaria, Hesse, and Rhineland-Palatine.

[35] Moreover, in Table 2, we found no spatial discontinuity in university education in 1970 at the border between the 1945-1949 French and US occupation zones in South-West Germany. In Appendix Table C2, we show that there also was no spatial discontinuity in 1970 in the population share with an upper-secondary school degree or a vocational school degree.

tion zone. This can be seen most clearly in contrasting the 1945-1949 occupation zone of France in South-West Germany with the neighboring occupation zone of the US—which did instead admit refugees. In 1950, one year after the occupation zones were dissolved, the ratio of refugees to non-refugees was 18 percentage points higher on the former US side of the 1945-1949 border than on the former French side. The spatial discontinuity in refugee settlements coincided with a spatial discontinuity in population density, which in 1950 was 20 percentage points greater on the former US side of the border. Prior to WWII, population density had never differed significantly across what would become the South-West German border between the two occupation zones in 1945.

In 2020, almost 75 years after the arrival of WWII refugees, there continues to be a spatial discontinuity in population density across the former border. Population density is around 25 percentage points greater on the former US side. The greater density coincides with higher rents as well as higher productivity and wages.

The economic differences we observe today across the 1945-1949 border are consistent with agglomeration economies triggered by the arrival of WWII refugees in the US occupation zone. The evidence indicates that these agglomeration economies spill over to neighboring municipalities. Once we account for spillovers, whether a municipality is located on the former French or the former US side of 1945-1949 border is no longer a statistically significant determinant of productivity, wages, and rents today.

Our examination of potential alternative explanations for today's economic differences across the 1945-1949 border focuses on socio-economic differences predating WWII and on potential legacies of the 1945-1949 period of French and US occupation. Though we look far and wide, there appears to be very little evidence for such explanations.

War, civil conflicts, economic collapse, climate change, and natural disasters continue to cause massive refugee movements around the world. We hope that our analysis can contribute to the public debate on the benefits and costs of admitting refugees—which has accompanied refugee movements for at least 300 years (Defoe, 1709). The arguments put forward generally center on the humanitarian reasons for admitting refugees and economic costs and benefits in the short and medium term. Our study shows that the long-run benefits can, however, be considerable.

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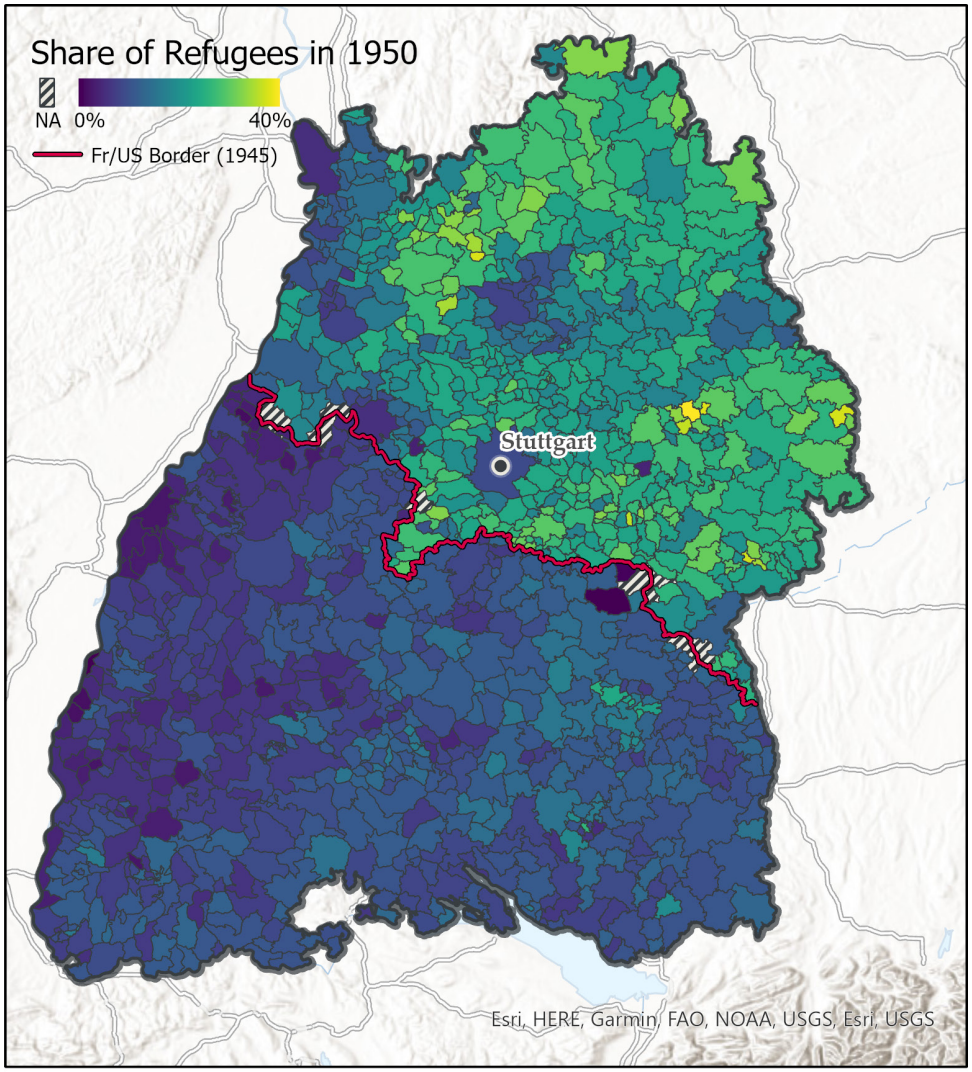
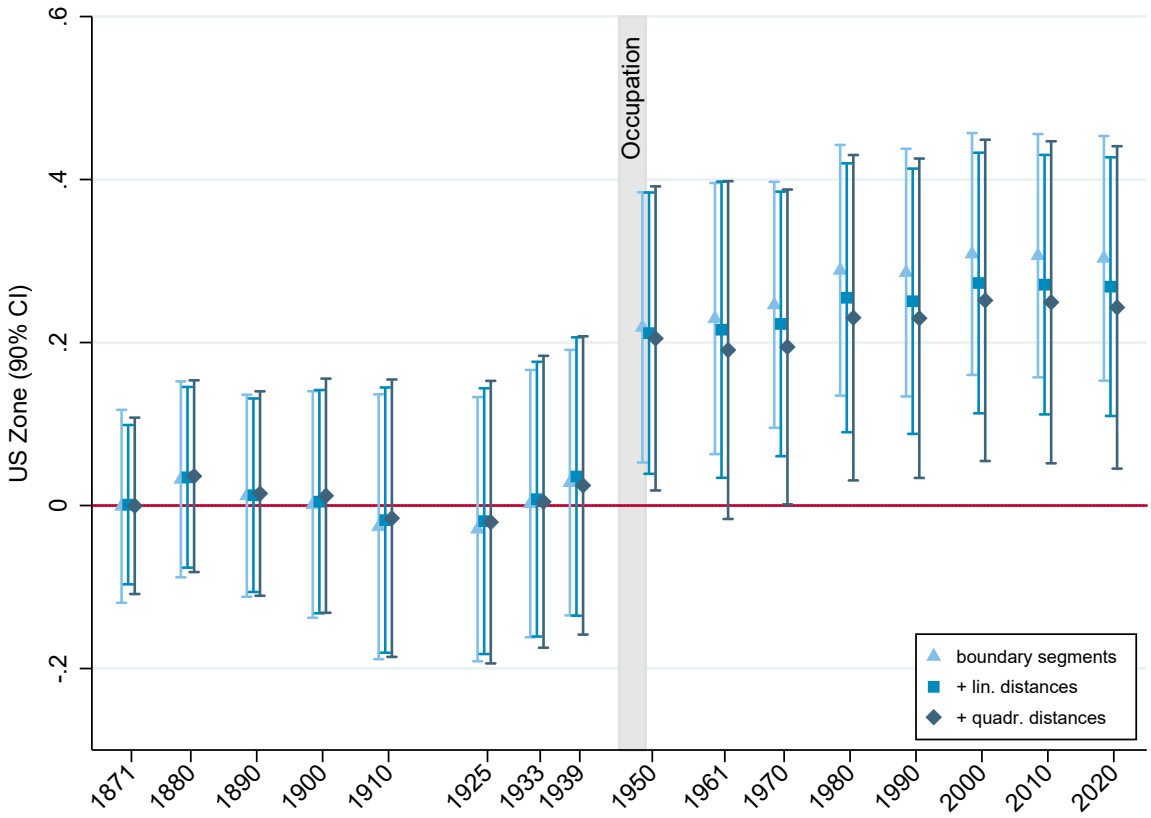
Figure 1: Population Share of WWII Refugees in 1950



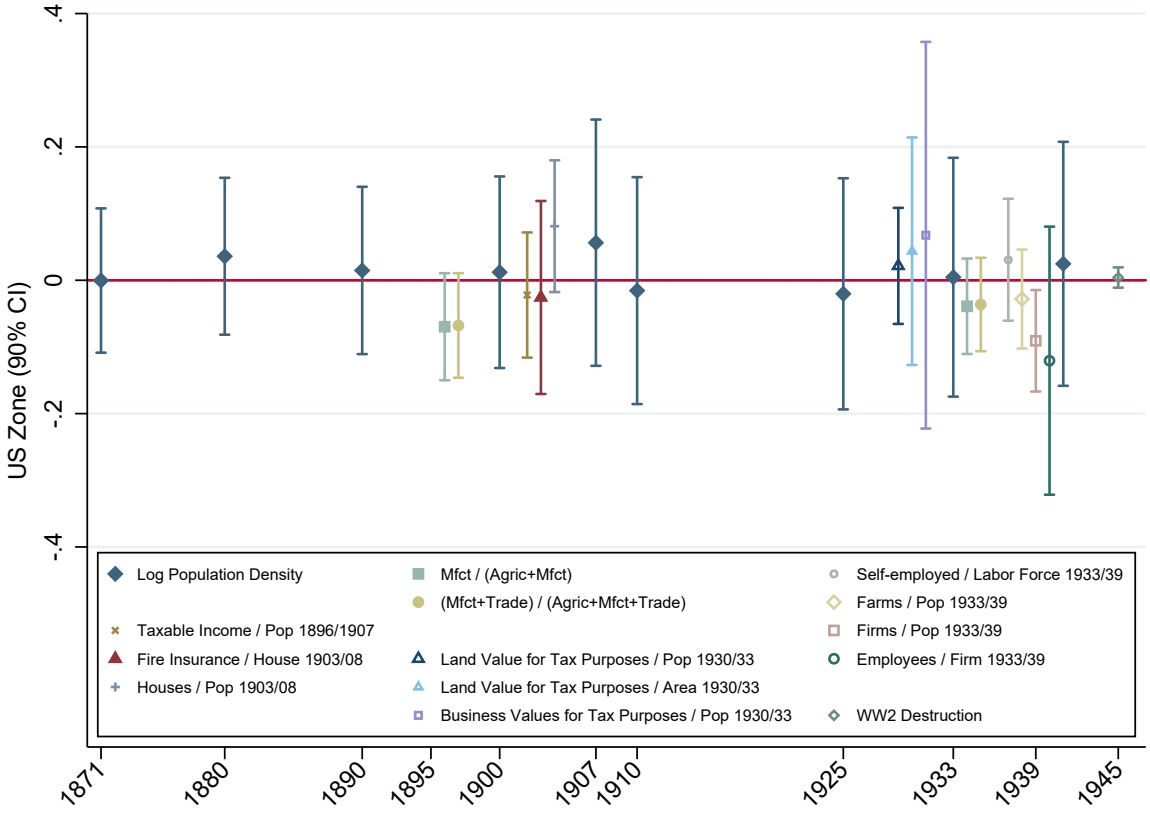
Notes: The map shows the population share of refugees in 1950 at the municipality level for Baden-Württemberg. Refugees are defined as individuals who in 1939 (i) resided in the territories of pre-WWII Germany to the east of the four post-WWII occupation zones or (ii) resided outside of pre-WWII Germany and were native German speakers. The red line indicates the border between the 1945-1949 French and US occupation zones. The data is aggregated at the level of modern municipalities. The six municipalities marked with stripes subsume historic municipalities that before the territorial reform of the early 1970s were on different sides of the 1945-1949 occupation-zone border. We exclude these municipalities from our empirical analysis.

Figure 2: Population Density from 1871 to 2020



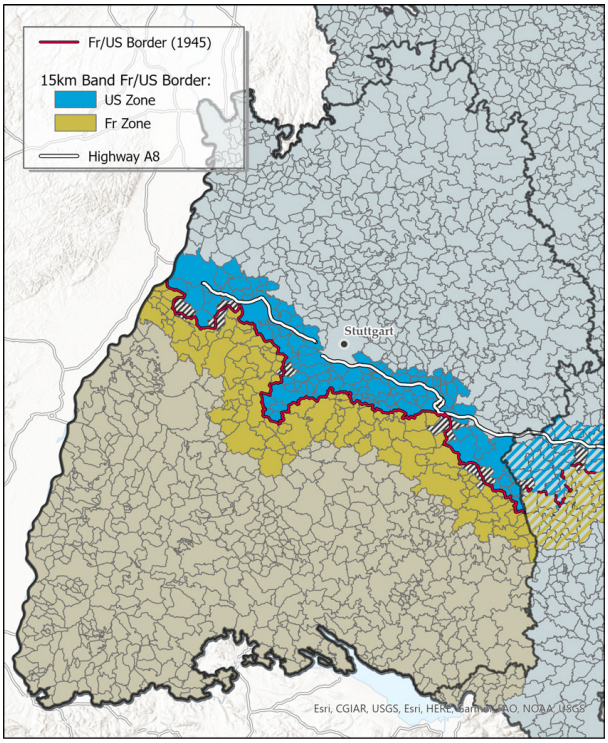
Notes: The figure shows regression coefficients for the difference in population density across the border between the 1945-1949 French and US occupation zones and corresponding 90% confidence intervals. The analysis includes municipalities within 15 km from the 1945-1949 occupation-zone border. Confidence intervals are based on Conley (1999) standard errors with a Bartlett kernel and a cutoff value of 25 km. Results are from separate regressions for years between 1871 and 2020. All regressions are local linear regressions controlling for longitude and latitude and fixed effects for five boundary segments. The estimates marked in light blue additionally control for linear distance to Stuttgart and the closest highway exit in 1940. The estimates marked in dark blue control for linear and quadratic distance to Stuttgart and to the closest highway exit in 1940—our baseline specification for all following results.

Figure 3: Economic Characteristics Before WWII

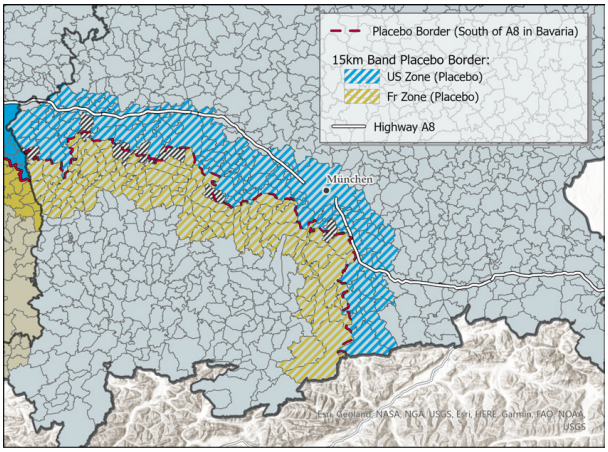


Notes: The figure shows regression coefficients for the difference in pre-WWII characteristics across what would become the border between the 1945-1949 French and US occupation zones and corresponding 90% confidence intervals. Confidence intervals are based on Conley (1999) standard errors with a Bartlett kernel and a cutoff value of 25 km. The analysis includes municipalities within 15 km from the 1945-1949 occupation-zone border. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects.

Figure 4: The 1945-1949 Border in Baden-Württemberg, the A8 Highway, and a Placebo in Bavaria



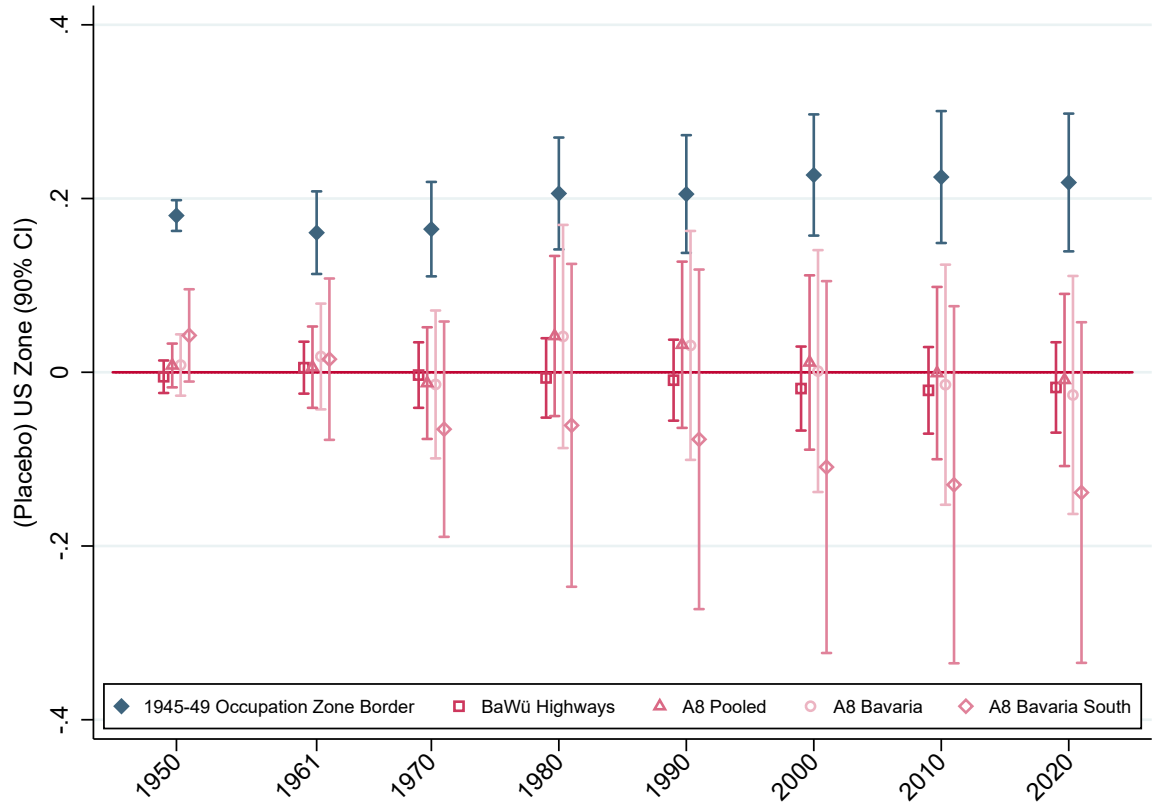
(a) Baden-Württemberg



(b) Bavaria

Notes: Figure (a) shows a map of the state of Baden-Württemberg and highlights municipalities within 15 km of the border between the 1945-1949 French and US occupation zones. The map also shows the location of the A8 highway that determined where the border was placed. Figure (b) displays municipalities and the A8 highway in the neighboring state of Bavaria. This state was part of the 1945-1949 US occupation zone (with the exception of one county, far off the A8 highway). To examine today's economic effects across the 1945-1949 occupation-zone border in Baden-Württemberg using a placebo strategy, we construct placebo borders along the Bavarian segment of the A8 highway. These placebo borders are drawn by replicating the rule the US employed to determine its 1945-1949 occupation-zone border within Baden-Württemberg (i.e., all historical counties crossed by the A8 highway should be in the US occupation zone). The figure illustrates the placebo border and municipalities within 15 km of the placebo border in the case where we place the placebo-French occupation zone to the south of the placebo-US occupation zone. We also examine the case where the placebo-French occupation zone is placed to the north of the placebo-US occupation zone and analogous placebo borders along highways in Baden-Württemberg.

Figure 5: Population Growth Across the 1945-1949 Border and Across Placebo Borders



Notes: The figure shows regression coefficients for the difference in population growth since 1939 across the border between the 1945-1949 French and US occupation zones in blue. Results are for population growth up to different years between 1950 and 2020. The analysis includes municipalities within 15 km from the 1945-1949 occupation-zone border. The same regression coefficients across placebo borders along highways in Baden-Württemberg and Bavaria are shown in different shades of red. Placebo borders are drawn by replicating the rule the US employed to determine its 1945-1949 occupation-zone border within Baden-Württemberg. The 90% confidence intervals are based on Conley (1999) standard errors with a Bartlett kernel and a cutoff value of 25 km. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to either Stuttgart in Baden-Württemberg or to Munich in Bavaria, quadratic polynomials in distance to the closest highway exit in 1940, and five boundary segment fixed effects.

Table 1: Refugees in 1950 Across the 1945-1949 Border

	(1)	(2)	(3)	(4)
	Refugees / Pop		Refugees / non-Refugees	
US Zone	0.126***	0.122***	0.181***	0.176***
	(0.009)	(0.012)	(0.014)	(0.019)
Share 1939 Pop in US Zone (10km circle)		0.016		0.017
		(0.024)		(0.037)
Observations	217	217	217	217

Notes: The table shows regression results for the population share of refugees in 1950 and the ratio of refugees to non-refugees at the municipality level. Refugees are defined as individuals who in 1939 (i) resided in the territories of pre-WWII Germany to the east of the four post-WWII occupation zones or (ii) resided outside of pre-WWII Germany and were native German speakers. The analysis includes municipalities within 15 km from the 1945-1949 occupation-zone border. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. Standard errors are Conley standard errors with a Bartlett kernel and a cutoff value of 25 km.

Table 2: Economic Outcomes in the Long Run, the Medium Run, and Prior to WWII

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Aggregate Income						
	2007-2017		1980		1895/1906	
US Zone	0.014	-0.025	-0.000	-0.048	-0.022	-0.000
	(0.018)	(0.023)	(0.032)	(0.032)	(0.057)	(0.063)
Share 1939 Pop in US Zone (within 10km)		0.139***		0.170***		-0.071
		(0.046)		(0.054)		(0.111)
Observations	1,519	1,519	217	217	217	217
Panel B: Aggregate Productivity						
	2007-2018					
US Zone	0.130**	0.053				
	(0.057)	(0.065)				
Share 1939 Pop in US Zone (within 10km)		0.270*				
		(0.148)				
Observations	2,558	2,558				
Panel C: Rents						
	2008-16		1987		1970	
US Zone	0.120***	0.011	0.080***	0.011	0.056*	0.031
	(0.026)	(0.027)	(0.015)	(0.026)	(0.032)	(0.036)
Share 1939 Pop in US Zone (within 10km)		0.232***		0.155***		0.087
		(0.057)		(0.042)		(0.062)
Observations	314,765	314,765	255,969	255,969	215	215
Panel D: University Education						
	1999-2020		1989-1998		1970	
US Zone	0.013**	-0.001	0.006*	-0.004	-0.006	-0.012
	(0.006)	(0.006)	(0.004)	(0.004)	(0.007)	(0.009)
Share 1939 Pop in US Zone (within 10km)		0.049***		0.036***		0.021
		(0.012)		(0.008)		(0.014)
Observations	4,786	4,786	2,180	2,180	218	218
Panel E: Hourly Wages and Value Added in Manufacturing						
	Hourly Wages 1995-2012		Value Added / hr. 1995-2012			
US Zone	0.076**	0.045	0.074	-0.006		
	(0.034)	(0.037)	(0.052)	(0.064)		
Share 1939 Pop in US Zone (within 10km)		0.105**		0.267***		
		(0.054)		(0.098)		
Observations	3,415	3,415	3,402	3,402		

Notes: The table shows regression results for income, productivity, rents, education, and hourly wages and value added in manufacturing. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. The analysis includes municipalities within 15 km from the 1945-1949 occupation-zone border. Standard errors are Conley standard errors with a Bartlett kernel and cutoff values of 25 km and 20 years. Regressions that pool multiple years include year fixed effects. Regressions for rents in Panel C control for property characteristics. Rents from ImmobilienScout24 are offered rents, rents from the census 1987 are self-reported rents for properties rented after 1985, and rents in 1970 are average self-reported rents at the municipality level. Panel E shows results from the sample of all one-establishment firms in the manufacturing sector surveyed in the cost structure survey from 1995 to 2012. We control for dummies for 11 firm size groups and fixed effects for 4-digit industries.

Table 3: Long-Run Economic Outcomes Across Placebo Borders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Aggregate Income								
	BaWü Highways		A8 Pooled		A8 Bavaria		A8 Bavaria South	
Placebo-US Zone	0.023	0.011	-0.003	0.012	-0.015	-0.024	0.024	-0.010
	(0.022)	(0.040)	(0.020)	(0.022)	(0.029)	(0.029)	(0.050)	(0.043)
Share 1939 Pop in Placebo-US Zone (within 10km)		0.020		-0.041		0.023		0.120
		(0.046)		(0.037)		(0.053)		(0.093)
Observations	7,777	7,777	4,809	4,809	3,241	3,241	1,449	1,449
Panel B: Aggregate Productivity								
	BaWü Highways							
Placebo-US Zone	-0.074	0.055						
	(0.054)	(0.115)						
Share 1939 Pop in Placebo-US Zone (within 10km)		-0.201						
		(0.142)						
Observations	12,772	12,772						
Panel C: Rents								
	BaWü Highways		A8 Pooled		A8 Bavaria		A8 Bavaria South	
Placebo-US zone	-0.016	0.047	0.012	0.015	0.016	0.004	0.012	-0.008
	(0.044)	(0.038)	(0.023)	(0.022)	(0.033)	(0.029)	(0.026)	(0.024)
Share 1939 Pop in Placebo-US Zone (within 10km)		-0.086		-0.010		0.042		0.074
		(0.086)		(0.023)		(0.034)		(0.055)
Observations	1,150,461	1,150,461	1,608,070	1,608,070	1,125,004	1,125,004	554,498	554,498
Panel D: University Education								
	BaWü Highways		A8 Pooled		A8 Bavaria		A8 Bavaria South	
Placebo-US Zone	0.008	0.008	0.002	0.000	-0.006	-0.014*	-0.017*	-0.024**
	(0.007)	(0.007)	(0.005)	(0.006)	(0.007)	(0.007)	(0.010)	(0.010)
Share 1939 Pop in Placebo-US Zone (within 10km)		0.001		0.005		0.021		0.027
		(0.013)		(0.010)		(0.014)		(0.023)
Observations	3,577	3,577	2,061	2,061	1,389	1,389	621	621
Panel E: Hourly Wages								
	BaWü Highways		A8 Pooled		A8 Bavaria		A8 Bavaria South	
Placebo-US zone	0.015	-0.006	0.043	0.024	0.067	0.089	0.106*	0.087
	(0.026)	(0.059)	(0.026)	(0.045)	(0.049)	(0.073)	(0.058)	(0.075)
Share 1939 Pop in Placebo-US Zone (within 10km)		0.030		0.047		-0.074		0.074
		(0.071)		(0.072)		(0.126)		(0.142)
Observations	16,218	16,218	9,036	9,036	4,640	4,640	2,211	2,211
Panel F: Value added / hr.								
	BaWü Highways		A8 Pooled		A8 Bavaria		A8 Bavaria South	
Placebo-US zone	-0.004	0.032	0.011	-0.020	0.015	0.013	0.068	0.045
	(0.035)	(0.070)	(0.039)	(0.055)	(0.068)	(0.089)	(0.084)	(0.106)
Share 1939 Pop in Placebo-US Zone (within 10km)		-0.050		0.077		0.008		0.086
		(0.093)		(0.077)		(0.154)		(0.222)
Observations	16,064	16,064	8,896	8,896	4,537	4,537	2,160	2,160

Notes: This table shows regression results for the long-run economic outcomes in Table 2 across various placebo borders along highways in Baden-Württemberg and Bavaria. Placebo borders are drawn by replicating the rule the US employed to determine its 1945-1949 occupation-zone border within Baden-Württemberg (i.e., counties crossed by the A8 highway should be in the US occupation zone). The analysis includes municipalities within 15 km of the placebo borders. Columns (1)-(2) pool data for municipalities in Baden-Württemberg across placebo borders along the A5, A6, A7, and A81 highways, and along the placebo border north of the A8 highway. Columns (3)-(4) pool data for municipalities across the three placebo borders along the A8 highway in Baden-Württemberg and Bavaria. The placebo border in Baden-Württemberg is to the north of the highway. Columns (5)-(6) pool data for municipalities across the two placebo borders along the A8 highway in Bavaria. Columns (7)-(8) show results for the placebo border south of the A8 highway in Bavaria. The measure of aggregate productivity available for Baden-Württemberg is not published for Bavarian municipalities and education for Bavarian municipalities is only available for the years 2007, 2010, and 2013. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, five boundary segment fixed effects, and year fixed effects. Additionally, we control for house characteristics in Panel C, and for 11 firm size group dummies and 4-digit industries fixed effects in Panels E and F. Standard errors are Conley standard errors with a Bartlett kernel and cutoff values of 25 km and 20 years.

Table 4: Adjustments Across the 1945-1949 Border before 1971

	(1)	(2)	(3)
Panel A: Income per Capita			
	Annual Growth		Level
	1900-1954	1954-1971	1954
US Zone	0.001	0.011**	-0.001
	(0.002)	(0.004)	(0.193)
Observations	20	20	20
Panel B: GDP per Capita			
	Annual Growth		Level
	1935-1950	1957-1970	1950
US Zone	0.001	0.010*	0.009
	(0.028)	(0.006)	(0.400)
Observations	20	20	20
Panel C: Population			
	Gain 1949-1950	Annual Growth 1950-1960	Refugees from SZ 1960
US Zone	-0.048***	-0.002	-0.001
	(0.008)	(0.003)	(0.004)
Observations	216	217	217
Panel D: Manufacturing Share			
	Annual Growth		
	1933/39-1950	1950-1960	1960-1970
US Zone	0.005***	-0.003***	0.002
	(0.001)	(0.001)	(0.002)
Observations	217	217	217

Notes: Regressions in Panels A and B are at the county level. The sample consists of all counties with at least one municipality within 15 km of the border between the 1945-1949 French and US occupation zones in South-West Germany. The income data comes from tax statistics. In 1935 and 1950, GDP is approximated by total revenue subject to value-added tax. GDP in 1957 and 1970 comes from regional GDP accounts published by the German Statistical Offices. Growth regressions measure the difference in annual log growth of the outcome across the border, level regressions measure the log difference across the border. Regressions in Panels C and D are at the municipality level. The sample includes municipalities within 15 km of the 1945-1949 occupation-zone border. Panel C examines a proxy for 1949-1951 population growth, population growth from 1950 to 1960, and the population share of refugees from the German Democratic Republic (1945-1949 Soviet occupation zone) in 1960. These refugees started arriving in the Federal Republic of Germany in the 1950s. Panel D examines changes in the share of manufacturing employment in total employment in manufacturing and agriculture. All regressions are local linear regressions on the county level controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, five boundary segment fixed effects. Standard errors are Conley standard errors with a Bartlett kernel and a cutoff value of 25 km.

Table 5: Additional Outcomes Across the 1945-1949 Border

	(1)	(2)	(3)	(4)
Panel A: Industry Dismantling and Military Bases				
	Share Dismantled Establishments		Military Base Indicator	
US Zone	-0.0011**	-0.0014***	0.005	0.046
	(0.00058)	(0.00054)	(0.023)	(0.033)
Share 1939 Pop in US Zone (within 10km)		0.0010		-0.143
		(0.00078)		(0.094)
Observations	218	218	218	218
Panel B: Exports in Manufacturing				
	Internat. Revenue / Revenue		Non-EU Revenue / Revenue	
US Zone	-0.013	-0.016	-0.006	-0.004
	(0.021)	(0.024)	(0.015)	(0.015)
Share 1939 Pop in US Zone (within 10km)		0.010		-0.008
		(0.032)		(0.021)
Observations	3,840	3,840	1,468	1,468
Panel C: Headquarters in Manufacturing				
	Headquarter in same Municipality			
US Zone	0.025	-0.031		
	(0.103)	(0.130)		
Share 1939 Pop in US Zone (within 10km)		0.162		
		(0.187)		
Observations	6,119	6,119		
Panel D: Firm Size				
	Workers / Firm		Workers / Plant	
US Zone	-0.148	-0.134	-0.078	-0.045
	(0.119)	(0.138)	(0.106)	(0.130)
Share 1939 Pop in US Zone (within 10km)		-0.047		-0.118
		(0.262)		(0.233)
Observations	2,563	2,563	2,559	2,559
Panel E: English in Secondary School				
	English as First Foreign Language		English as Advanced Course	
US Zone	-0.006	0.001	-0.006	-0.006
	(0.006)	(0.005)	(0.016)	(0.022)
Share 1939 Pop in US Zone (within 10km)		-0.016		0.000
		(0.015)		(0.028)
Observations	1,933	1,933	690	690

Notes: Panel A examines the share of all (non-agricultural) establishments that were dismantled and an indicator if the municipality continued to host a military base after the occupation period. Panel B examines the share of international revenue in total revenue and the share of revenue from non-EU countries in total revenue for the manufacturing firms in Table 2. Panel C examines an indicator for whether the firm headquarters of a manufacturing establishment is located in the same municipality. Panel D examines the log of the size of establishments in the municipality and the size of firms registered in the municipality. Panel E examines the share of students in secondary school who take English rather than French as their first foreign language, and the share of students who elect advanced English rather than advanced French in upper-secondary school. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. The analysis includes municipalities within 15 km of the 1945-1949 occupation-zone border. Regressions that pool multiple years include year fixed effects. Standard errors are Conley standard errors with a Bartlett kernel and cutoff values of 25 km and 20 years.

Table 6: Individual-Level Characteristics from the German Socio-Economic Panel

	(1)	(2)	(3)	(4)	(5)
Panel A: Health and Education					
	Body Height	Body Weight	Mental Health	Physical Health	Years of Education
Occupation Period	-0.000	0.009	0.027	0.006	0.006
	(0.004)	(0.021)	(0.014)	(0.016)	(0.013)
US Zone	0.000	0.005	-0.002	-0.009	-0.005
	(0.004)	(0.019)	(0.014)	(0.016)	(0.014)
US Zone × Occupation Period	0.006	-0.012	0.001	0.046	0.034
	(0.008)	(0.038)	(0.022)	(0.032)	(0.020)
Observations	1,098	1,090	1,818	1,818	3,815
Panel B: Norms and Attitudes					
	Interest in Politics	Leaning towards Party	Union in Estab	Risk Preferences	
US Zone	-0.036	-0.037	0.049	-0.002	
	(0.023)	(0.024)	(0.044)	(0.131)	
Observations	48,233	48,228	4,934	25,345	
	The most important policy objective is				
	Peace and Order	More Citizen Influence	Price Stability	Free Speech	
US Zone	0.024	-0.002	-0.024	0.008	
	(0.038)	(0.034)	(0.087)	(0.091)	
Observations	5,788	5,777	5,761	5,779	

Notes: The table is based on individual-level data from the German Socio-Economic Panel (SOEP). In Panel A, columns (1)-(4), the sample consists of individuals in the SOEP born after 1945 and before 1955 in Baden-Württemberg, Bavaria, Hesse, or Rhineland-Palatine (the states neighboring Baden-Württemberg). In column (5), the sample consists of individuals in the SOEP born after 1923 and before 1955. The occupation period indicator variable equals one if the individual was born before 1949 in columns (1)-(4) and before 1943 in column (5). The US zone indicator variable equals one if the individual was born in the 1945-1949 US occupation zone. The regressions pool survey years and include survey year fixed effects. In Panel B, the sample consists of SOEP respondents who have lived in Baden-Württemberg for at least five years. The regressions pool all survey years in which the respective question was asked and include survey year fixed effects. All regressions are linear regressions controlling for longitude and latitude, linear polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. Additionally, we control for a gender dummy, a quadratic function of age, an indicator for having a partner in the household, years of work experience, unemployment, log household income, a dummy for first-generation migrants, and years of education (unless this is the outcome). Standard errors are Conley standard errors with a Bartlett kernel and a cutoff value of 25 km.

A Data

Historical census data Our historical outcome data is collected from historical censuses at the municipality level in Baden (1871, 1895, 1903, 1930, and 1939), Württemberg (1871, 1895, 1907, and 1933), and Baden-Württemberg (1950, 1960, and 1970/71). A detailed overview of all variables and sources is provided in Table A1. Most historical accounts are hand-digitized from the original sources, only population density is provided by the Statistical Office of Baden-Württemberg. For some statistics, data for Baden and Württemberg is not available for the same year. In these cases, we use information from different census years, e.g., sectoral employment shares in Württemberg 1933 and in Baden 1939. In all regressions that combine data from different years or different sources, we include an indicator that equals one if the data is from Baden. We also obtain historical data from income tax statistics in 1954 and 1971 (provided by the Statistical Office of Baden-Württemberg), from value-added taxes in 1935 and 1950, and from regional GDP accounts in 1957 and 1970. These measures are only available at the county level.

Modern outcome data The data on municipality-level sales per worker, income per capita, and education comes from a collection of online databases put together by the Statistical Office of Baden-Württemberg. Variable descriptions and detailed sources are in Table A1. The statistical office also provided 2005-2020 data on foreign-language courses in secondary schools.

Geographic data We use several sources to collect data on the geography of Baden-Württemberg. Historical maps are obtained from the House of History Baden-Württemberg in Stuttgart. These maps are used to obtain the longitude and latitude of municipality centers, the required geographic distances, and the territory for municipalities and counties before the territorial reform in the early 1970s. For modern geographic data, we combine information from the German Federal Agency for Cartography and Geodesy with the municipality directory (*Gemeindeverzeichnis*) of the German Statistical Office (2016). For part of the analysis, we aggregate historical municipality-level data to modern municipality borders.[36] All geospatial calculations are done using QGIS.

Wartime destruction and military bases We obtain data on wartime destruction from the Historical Atlas of Baden-Württemberg (Ch. 7,11, Kommission für geschichtliche Landeskunde in Baden-Württemberg (eds.), 1972-1988). The atlas reports a percentage score of wartime destruction of housing and industry at the municipality level that is collected from various sources. We gather lists of French and US military bases in Baden-Württemberg and their year of dissolution from Wikipedia.

Industry dismantling We use detailed information on industry dismantling provided by Reichelt (1947) who lists establishments that had been dismantled or were planned to be dismantled by the occupation forces. We also rely on Harmssen (1951), who adjusts the list for establishments that were later saved from dismantling. We digitize this information, assign each listed establishment to its

[36] The territorial reform in the early 1970s created six municipalities that stretch out across both sides of the 1945-1949 border between the French and US occupation zones. We exclude these municipalities from our empirical analysis.

location, and construct a municipality-level measure of industry dismantling by computing the share of pre-war establishments that were dismantled.

Micro-data on establishments We use plant-level micro data provided by the German Statistical Offices in the project "Administrative Firm-Data for Germany" (AFiD, Statistische Ämter der Länder, 2017a). This data contains a panel of the universe of plants in manufacturing and collects information on employment, working hours, and revenues. Of particular interest is the subset of establishments for which we also have data on wages, value-added, and exports in a representative survey (*Kostenstrukturerhebung*, Statistische Ämter der Länder, 2017b). In contrast to the AFiD panel, the data on wages, value-added, and exports is provided at the firm level. It covers 45% of all firms with at least 20 employees and is available for 1995, 1997, 1999, 2003, 2008, and 2012. Firms are sampled stratified by industry and firm size and are required by law to report their information.

Micro-data on rents We use property-level data to measure rents in 1987 and from 2008 to 2016. For 1987, we use the census (Statistische Ämter der Länder, 1987), which is based on the full population count in Germany and contains housing information including rental prices. For the years 2008-2016, we use data from ImmobilienScout24 published by the RWI (Schaffner, 2020). ImmobilienScout24 is the largest real-estate internet platform in Germany with a market share of about 50%. The data contains information on offer rental prices and property characteristics.

Data on individuals We complement our analysis using individual information from the German Socio-economic Panel (SOEP), a longitudinal survey conducted since 1984 that is representative of the population living in Germany (Goebel et al., 2019). We use the spatial extension of the SOEP and measure health and education outcomes, norms and attitudes, and the preferences of individuals born or living in the 1945-1949 French and US occupation zones.

Bavaria The data on population, income, and education in Bavaria are provided by the Statistical Office of Bavaria (provided at https://www.statistikdaten.bayern.de/genesis/online/). The measure of aggregate productivity available for Baden-Württemberg is not published for Bavarian municipalities and education for Bavarian municipalities is only available for the years 2007, 2010, and 2013.

Table A1: Variable Description and Sources.

Outcome	Description	Source
Population		
1871-2020	Population	Statistical Office Baden-Württemberg via https://www.statistik-bw.de/BevoelkGebiet/Bevoelkerung/
Bavaria 1939-2020	Population	Statistical Office Bavaria via https://www.statistikdaten.bayern.de/genesis/online/
(GDR) Refugees		
1950 (refugees)	People who in 1939 (i) had their place of residence in the territories of pre-WWII Germany to the east of the four post-WWII occupation zones or (ii) resided outside of pre-WWII Germany and were native German speakers.	Gemeinde- und Kreisstatistik Baden-Württemberg 1950 (Statistisches Landesamt Baden-Württemberg, 1952)
1960 (GDR refugees)	People who came to the Federal Republic of Germany from the German Democratic Republic (GDR; 1945-1949 Soviet occupation zone)	Gemeindestatistik Baden-Württemberg 1960/61. Teil 1: Bevölkerung und Erwerbstätigkeit (Statistisches Landesamt Baden-Württemberg, 1964)
Sectoral Shares		
Baden 1895	Workers in agriculture, manufacturing, and trade	Beiträge zur Statistik des Grossherzogthums Baden. Heft 55. Die Berufszählung vom 14. Juni 1895 (Statistisches Landesamt Baden, 1895)
Württemberg 1907	Workers in agriculture, manufacturing, and trade	Württembergische Gemeindestatistik. Zweite Ausgaben nach dem Stand vom Jahre 1907 (Königliches Statistisches Landesamt Württemberg, 1910)
Württemberg 1933	Workers in agriculture, manufacturing, and trade	Württembergische Gemeinde und Bezirksstatistik. Dritte Ausgabe nach dem Stand vom Jahre 1933 (Statistisches Landesamt Württemberg, 1935)
Baden 1939	Workers in agriculture, manufacturing, and trade	Statistik des Deutschen Reichs. Band 557. Volks-, Berufs- und Betriebszählung vom 17. Mai 1939. Die Berufstätigkeit der Bevölkerung in den Reichsteilen. Heft 25: Baden (Statistisches Reichsamt, 1942)
1950	Workers in agriculture, manufacturing, and trade	Gemeinde- und Kreisstatistik Baden-Württemberg 1950 (Statistisches Landesamt Baden-Württemberg, 1952)
1960	Workers in agriculture, manufacturing, and trade	Gemeindestatistik Baden-Württemberg 1960/61. Teil 1: Bevölkerung und Erwerbstätigkeit (Statistisches Landesamt Baden-Württemberg, 1964)
1970	Workers in agriculture, manufacturing, and trade	Statistik von Baden-Württemberg. Gemeindestatistik 1970. Ergebnisse der Grosszählungen 1968-1971. Heft 2: Bevölkerung und Erwerbstätigkeit 1970 (Statistisches Landesamt Baden-Württemberg, 1973)
Houses & Fire Insurance		
Baden 1903	Fire insurance value & number of houses	Beiträge zur Statistik des Grossherzogthums Baden. Heft 61: Der pfandrechtlich gesicherte Schuldenstand auf 1. Januar 1903 (Statistisches Landesamt Baden, 1910)
Württemberg 1907	Fire insurance value & number of houses	Württembergische Gemeindestatistik. Zweite Ausgaben nach dem Stand vom Jahre 1907 (Königliches Statistisches Landesamt Württemberg, 1910)
Taxable Income		
Baden 1895	Total taxable income	Die Ergebnisse der im Jahre 1895 vollzogenen Veranlagung der Einkommensteuer (Finanzministerium und Steuerdirektion des Grossherzogthums Baden, 1896)
Württemberg 1907	Total taxable income	Württembergische Gemeindestatistik. Zweite Ausgaben nach dem Stand vom Jahre 1907 (Königliches Statistisches Landesamt Württemberg, 1910)

Continuation of Table A1

Outcome	Description	Source
1954-71 (county level)	Total taxable income	Income Tax Statistic (*Einkommensteuerstatistik*) 1954 and 1971. Provided by the Statistical Office Baden-Württemberg
1980	Total taxable income	Income Tax Statistic (*Einkommensteuerstatistik*) 1980. Provided by the Statistical Office Baden-Württemberg
2007-2017	Total taxable income	Wage and Income Tax Statistic (*Lohn- und Einkommensteuerstatistik*) via https://www.regionalstatistik.de
Aggregate Productivity		
1935 (county level)	Total revenue subject to sales taxes; number of assessed firms	Statistik des Deutschen Reichs. Volume 1. Heft 511: Umsatzsteuerstatistik 1935 (Statistisches Reichsamt, 1938)
1950 (county level)	Total revenue subject to sales taxes; number of assessed firms	Statistische Monatshefte Baden-Württemberg. II. Jahrgang. Heft 12 (Statistisches Landesamt Baden-Württemberg, 1954)
1957-70 (county level)	GDP	Das Bruttoinlandsprodukt der kreisfreien Städte und Landkreise. Heft 3 and Heft 4 (Statistische Landesämter, 1968, 1973)
2006-2018	Taxable sales (goods and services) per worker (subject to social security payments) for firms with at least one worker or at least 22,000 Euro in annual sales (excluding firms in agriculture, public administration, and private households)	Company Register (*Unternehmensregister*) via https://www.statistik-bw.de/GesamtwBranchen/UnternehmBetriebe
Land Values and Taxes		
Baden 1926	Value of land for tax purposes (Steuerwerte Grundvermögen)	Staatliche Grund- und Gewerbesteuer in Baden fuer das Rechnungsjahr 1926 auf Grund amtlichen Materials (Statistisches Landesamt Baden, 1930)
Württemberg 1933	Value of land for tax purposes (Kataster Grund)	Württembergische Gemeinde und Bezirksstatistik. Dritte Ausgabe nach dem Stand vom Jahre 1933 (Statistisches Landesamt Württemberg, 1935)
1950	Land tax rates (multiples of a state-wide base rate)	Gemeinde- und Kreisstatistik Baden-Württemberg 1950 (Statistisches Landesamt Baden-Württemberg, 1952)
1960	Land tax rates (multiples of a state-wide base rate)	Gemeindestatistik Baden-Württemberg 1960/61. Teil 5: Gemeindefinanzen (Statistisches Landesamt Baden-Württemberg, 1964)
1970	Land tax rates (multiples of a state-wide base rate)	Statistik von Baden-Württemberg. Gemeindestatistik 1970. Ergebnisse der Grosszählungen 1968-1971. Band 161. Heft 5: Weitere Strukturdaten (Statistisches Landesamt Baden-Württemberg, 1973)
Business Taxes		
Baden 1926	value of businesses for tax purposes (Steuerwerte Betriebsvermögen)	Staatliche Grund- und Gewerbesteuer in Baden für das Rechnungsjahr 1926 auf Grund amtlichen Materials (Statistisches Landesamt Baden, 1930)
Württemberg 1933	value of businesses for tax purposes (Kataster Gewerbe)	Württembergische Gemeinde und Bezirksstatistik. Dritte Ausgabe nach dem Stand vom Jahre 1933 (Statistisches Landesamt Württemberg, 1935)
1950	Business tax rates (multiples of a state-wide base rate)	Gemeinde- und Kreisstatistik Baden-Württemberg 1950 (Statistisches Landesamt Baden-Württemberg, 1952)
1960	Business tax rates (multiples of a state-wide base rate)	Gemeindestatistik Baden-Württemberg 1960/61. Teil 5: Gemeindefinanzen (Statistisches Landesamt Baden-Württemberg, 1964)

Continuation of Table A1

Outcome	Description	Source
1970	Business tax rates (multiples of a state-wide base rate)	Statistik von Baden-Württemberg. Gemeindestatistik 1970. Ergebnisse der Grosszählungen 1968-1971. Band 161. Heft 5: Weitere Strukturdaten (Statistisches Landesamt Baden-Württemberg, 1973)
Agricultural Establishments		
Württemberg 1933	Establishments in agriculture and forestry	Württembergische Gemeinde und Bezirksstatistik. Dritte Ausgabe nach dem Stand vom Jahre 1933 (Statistisches Landesamt Württemberg, 1935)
Baden 1939	Establishments in agriculture and forestry > 0.5ha	Endgültige Ergebnisse der Volks-, Berufs- und Betriebszählung am 17. Mai 1939 in den Gemeinden, Stadt- und Landkreisen, Landeskommissärbezirken und für das Land Baden im Ganzen (Badisches Statistisches Landesamt, 1941)
Non-Agricultural Establishments) & Employees		
Württemberg 1933	Non-agricultural establishments; workers	Württembergische Gemeinde und Bezirksstatistik. Dritte Ausgabe nach dem Stand vom Jahre 1933 (Statistisches Landesamt Württemberg, 1935)
Baden 1939	Non-agricultural establishments; workers	Endgültige Ergebnisse der Volks-, Berufs- und Betriebszählung am 17. Mai 1939 in den Gemeinden, Stadt- und Landkreisen, Landeskommissärbezirken und für das Land Baden im Ganzen (Badisches Statistisches Landesamt, 1941)
1950	Non-agricultural establishments; workers	Gemeinde- und Kreisstatistik Baden-Württemberg 1950 (Statistisches Landesamt Baden-Württemberg, 1952)
1960	Non-agricultural establishments; workers	Gemeindestatistik Baden-Württemberg 1960/61. Teil 3: Arbeitsstätten ohne Landwirtschaft (Statistisches Landesamt Baden-Württemberg, 1964)
1970	Non-agricultural establishments; workers	Statistik von Baden-Württemberg. Gemeindestatistik 1970. Ergebnisse der Grosszählungen 1968-1971. Heft 3: Nichtlandwirtschaftliche Arbeitsstätten 1970 (Statistisches Landesamt Baden-Württemberg, 1973)
Self-Employed		
Württemberg 1933	Self-employed workers in agriculture, trade, manufacturing, and other professions	Württembergische Gemeinde und Bezirksstatistik. Dritte Ausgabe nach dem Stand vom Jahre 1933 (Statistisches Landesamt Württemberg, 1935)
Baden 1939	Self-employed workers	Endgültige Ergebnisse der Volks-, Berufs- und Betriebszählung am 17. Mai 1939 in den Gemeinden, Stadt- und Landkreisen, Landeskommissärbezirken und für das Land Baden im Ganzen (Badisches Statistisches Landesamt, 1941)
WW2 Destruction	Percentage score of war destruction	Historischer Atlas von Baden-Württemberg. Erläuterungen 7, 11. Kriegsschäden in Baden-Württemberg 1939-1945 (Kommission für geschichtliche Landeskunde in Baden-Württemberg (eds.), 1972-1988)
Industry Dismantling	Dismantled establishments / (non-agricultural) establishments in 1933/39	Reichelt (1947) and Harmssen (1951)
Military Bases	Indicator that equals one if a municipality hosted a US or French military base that was dissolved later than 1950	Wikipedia via https://de.wikipedia.org/wiki/Liste_der_franz%C3%B6sischen_Milit%C3%A4rstandorte_in_Deutschland and https://de.wikipedia.org/wiki/Liste_der_amerikanischen_Milit%C3%A4rstandorte_in_Deutschland, last accessed on Nov 3rd
Education		

Continuation of Table A1

Outcome	Description	Source
1970	Highest completed degree in population (high school, vocational, college)	Gemeindestatistik 1972. Ausgewählte Ergebnisse der Volks- und Arbeitsstättenzählung 1970 in der Gliederung nach den neuen Kreisen und Regionalverbänden. Heft 2: Bevölkerung und Erwerbstätigkeit Arbeitsstätten und Beschäftigte (Statistisches Landesamt Baden-Württemberg, 1972)
1989-1998	Share of workers (subject to social security contributions) at place of residence with university degree	Available at Statistics Service of the Bundesagentur für Arbeit
1999-2020	Share of workers (subject to social security contributions) at place of residence with university degree	Bundesagentur für Arbeit via `https://www.statistik-bw.de/Arbeit/Besch\unhbox\voidb@x\bgroup\accent127a\protect\penalty\@M\hskip\z@skip\egroupftigte/`
Bavaria 2007, 2010, 2013	Share of workers (subject to social security contributions) at place of residence with university degree	Statistical Office Bavaria via `https://www.statistikdaten.bayern.de/genesis/online/`
Rents		
1970	Average (cold) rent in the municipality per square meter, aggregated to modern municipalities using the share in the total number of apartments	Statistik von Baden-Württemberg. Gemeindestatistik 1970. Ergebnisse der Grosszählungen 1968-1971. Band 161. Heft 1: Gebäude und Wohnungen 1968 (Statistisches Landesamt Baden-Württemberg, 1973)
1987	(Cold) rent and characteristics (size, number of rooms, year of construction, kitchen or kitchenette, bathroom, toilet, mode of heating, building type (building with normal apartments or building including community use areas)) for properties that were rented between 1985 and 1987 excluding social housing	Volkszählung 1987 (Statistische Ämter der Länder, 1987)
2008-2016	Offer prices (cold rent) and characteristics (size, number of rooms, year of construction, balcony, basement, lift, quality of equipment, number of floors, floor, garden, terraced house, exclusive house, semi-detached house) for apartments and houses for rent from the internet platform ImmobilienScout24	RWI Real Estate Data: Apartments for Rent & Houses for Rent. RWI-GEO-RED (RWI; ImmobilienScout24, 2020)
Manufacturing Establishments		
	Value added, revenue, wages, employees, total work hours, international revenues, non-EU revenues for one-establishment firms in 1995, 1997, 1999, 2003, 2008, and 2012	AFiD Panel Industriebetriebe 1995-2016 (Statistische Ämter der Länder, 2017a). Panel der Kostenstrukturerhebung im Bereich verarbeitendes Gewerbe, Bergbau und Gewinnung von Steinen und Erden 1995-2012 (Statistische Ämter der Länder, 2017b).
SOEP Data		
	Body height, body weight, mental health score, physical health score, years of education, unemployment duration, income, interest in politics, tendency towards a certain political party, most important policy objective, union at workplace, risk preferences	Sozio-oekonomisches Panel (SOEP) (2019)
English Language		
2005-2019	Share of students in secondary school with English/French as first foreign language; share of students in upper-secondary school in advanced English/French course	Available at the Statistical Office of Baden-Württemberg

B Sensitivity Analysis

Bandwidth Our baseline sample consists of municipalities whose center is less than 15 km from the border between the 1945-1949 French and US occupation zones in Baden-Württemberg. In Figure B1 we show the main coefficients and 90% confidence intervals based on Conley standard errors for a range of bandwidth choices between 2 and 100km. The left-most figures in each row show the coefficient γ for the US zone indicator in equation (1).[37] The figures in the middle and on the right show the coefficient θ for the US zone indicator and δ for our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone in equation (2).

Standard errors Our baseline results are based on Conley (1999) standard errors that account for spatial and temporal correlation in the error terms. Our baseline choice for the spatial cutoff is 25 km and our baseline choice for the temporal cutoff is 20 years. In Tables B1-B4, Panel A, we provide results for alternative assumptions on the error structure. This includes default heteroscedasticity-robust errors, clustered standard errors on the municipality or county level, and alternative values for the spatial cutoff in the Conley standard errors.

RD polynomial In our baseline specification, the RD polynomial is a linear function of longitude and latitude. We use a triangular kernel where the weight for each municipality within the bandwidth declines linearly with distance to the border. In Tables B1- B4, Panel B, we provide results for alternative specifications of the RD polynomial. In particular, we use a uniform kernel that puts equal weight on each municipality within the bandwidth. For the multidimensional polynomial, we examine the sensitivity when we use quadratic or a cubic functions of longitude and latitude. In addition, we consider a one-dimensional regression discontinuity specification where the geographic location of a municipality is captured by a running variable in the distance to the border (instead of the location's latitude and longitude). We estimate versions with a local linear specification of the running variable interacted with the US zone indicator variable and with a local quadratic specification of the running variable interacted with the US zone indicator variable. This specification is similar to Schumann (2014).

Boundary segments In our baseline specification, we split the border into five segments of equal length and include indicator variables for the closest boundary segment. This ensures that we compare municipalities in spatial proximity on opposite sides of the border. In Tables B1-B4, Panel C, we provide results for a number of boundary segments ranging from 1 to 50.

Further controls In Tables B1-B4, Panel D, we provide results including additional controls. Columns (1)-(2) control for industry dismantling. The data on industry dismantling comes from detailed lists of dismantled establishments. We measure dismantling as the share of dismantled establishments among all non-agricultural establishments. The results in columns (3)-(4) examine the effect of wider exposure

[37] The Covid-19 pandemic severely restricted the opening hours of the research data centers where the micro-data for manufacturing used in Table 2 is made available. As a consequence, we were unable to implement the sensitivity analysis for these outcomes within the access period stipulated in our contract with the German Statistical Offices. However, we can make these results available in the future upon request.

to the arrival of refugees in the 1945-1949 US occupation zone controlling for distance to the border between the 1945-1949 French and US occupation zones. Distance to the border is defined as the distance to the border for municipalities in the 1945-1949 US occupation zone and negative distance to the border for municipalities in the 1945-1949 French occupation zone. Because of the irregular shape of the 1945-1949 occupation-zone border, municipalities at the same distance from the border can differ in their wider exposure to the arrival of refugees in the 1945-1949 US occupation zone.

Range of spillover effects In our baseline specification, the measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone is based on pre-WWII population within a 10 km radius around municipality centers. In Figure B2, we provide results when we vary the radius between 2 and 25 km. The figures on the left show the coefficient θ for the US zone indicator in equation (2) and the figures on the right show the coefficient δ for our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. The coefficient δ tends to be an inverse u-shaped function of the radius, with a maximum at around 10 km.

In order to better understand the figures for the coefficient δ, we conduct a simulation exercise. We assume that the true range of spillovers is 10 km and assess how estimates of δ in equation (2) vary with misspecification of the radius used to obtain wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. The geographic and population data in the simulation exercise is for municipalities that are within 15 km from the border between the 1945-1949 French and US occupation zones. The starting point of our simulation exercise is an artificial economic outcome that we generate according to

$$y_m = 1 + 0.139 * exp_m^{(10)} + u_m, \tag{B1}$$

where $exp_m^{(10)}$ is the share of 1939 population in a circle with a 10 km radius on what would become the 1945-1949 US occupation zone and $u_m \overset{i.i.d.}{\sim} \mathcal{N}(0, 0.07)$. That is, the artificial economic outcome is generated assuming that the true range of spillovers is 10 km. The effect of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone on the artificial outcome (0.139) is the value estimated for income in Table 2, Panel A, column (2). The side of the 1945-1949 occupation-zone border where the municipality is located is assumed to be irrelevant.

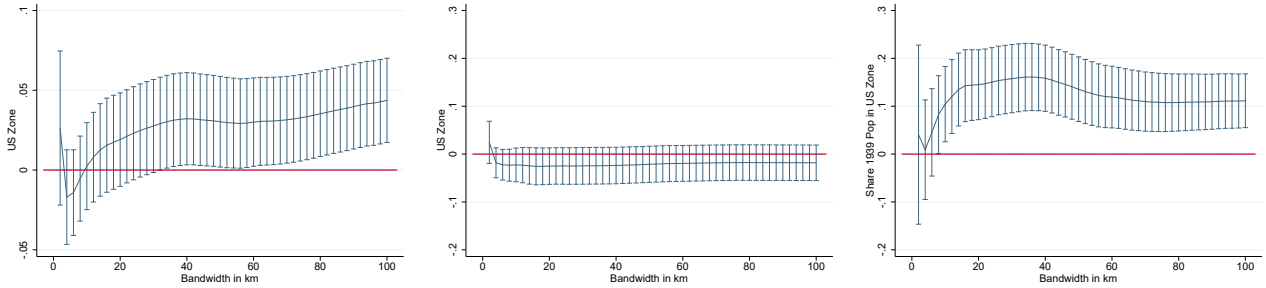
We then use the artificial outcome generated using equation (B1) to estimate

$$y_m = \alpha + \theta US_m + \delta exp_m^{(r)} + \varepsilon_m, \tag{B2}$$

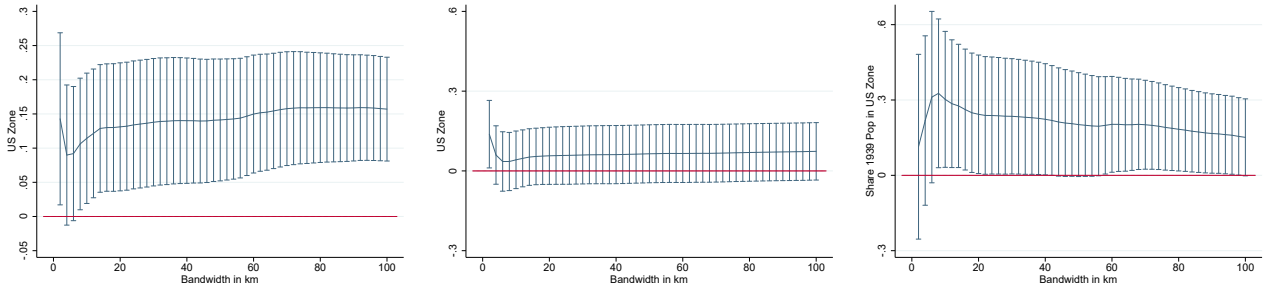
for values of $r \in \{2km, \ldots, 25km\}$. For each r, we repeat the process 100 times and obtain the average for θ, the average for δ, and the 90% confidence interval based on the standard deviation across simulations. Our results are displayed in Figure B3. The figure on the right depicts the results for δ as a function of the radius used to obtain wider exposure to the arrival of refugees in the 1945-1949 US occupation zone. The pattern appears similar to the one we find in the data. In particular, δ increases with the radius used up to 10 km (the true range of spillovers) and declines above 10 km.

Figure B1: Varying the Bandwidth around the 1945-1949 Border

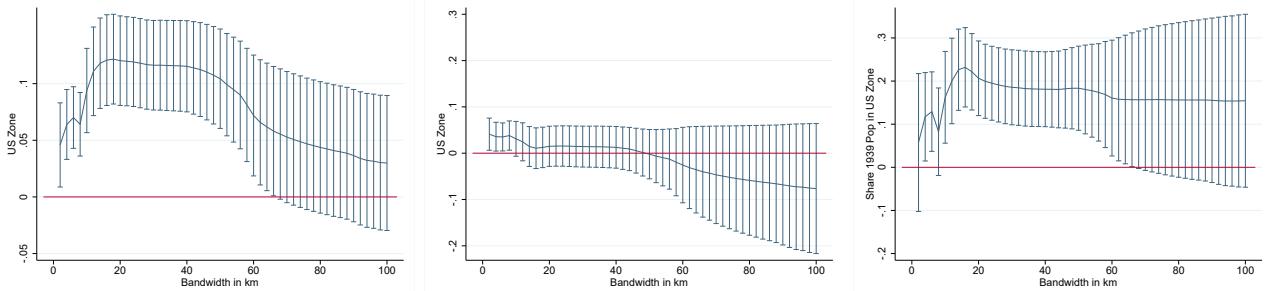
(a) Aggregate Income (2007-2017)



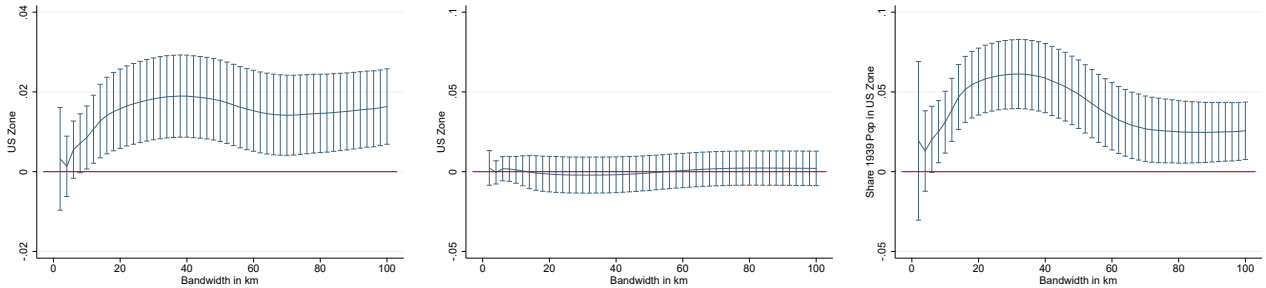
(b) Aggregate Productivity (2006-2018)



(c) Rents ImmobilienScout24 (2008-2016)



(d) Share University (1999-2020)

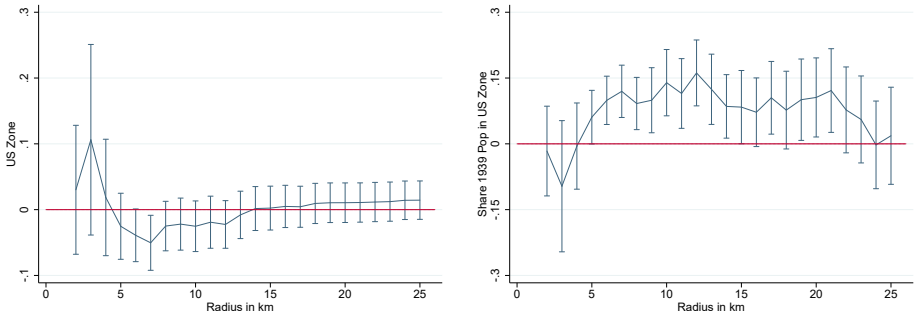


γ in equation (1) θ in equation (2) δ in equation (2)

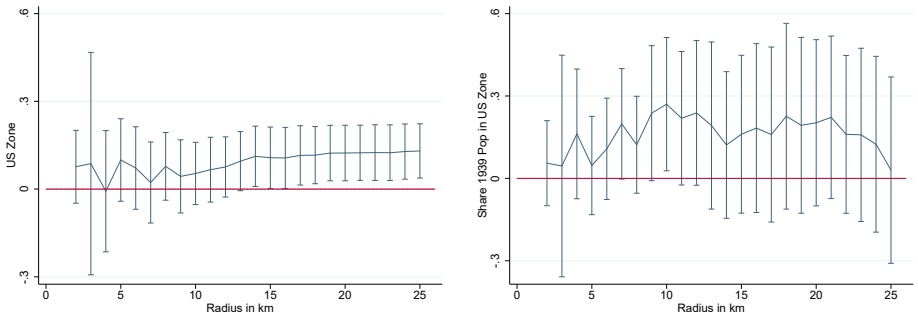
Notes: The left-most figure in each row plots the coefficient γ for the US zone indicator in equation (1) for varying bandwidths around the border between the 1945-1949 French and US occupation zones. The figures in the middle and on the right plot the coefficients θ and δ in equation (2) for varying bandwidths around the border. δ is the effect of our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone within a 10 km radius. θ is the effect for a (hypothetical) municipality that is on the former US side of the border between the 1945-1949 French and the US occupation zones, but close enough to the border so that half of the pre-WWII population within a 10 km radius is on what became the French side of the 1945-1949 occupation-zone border. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. All regressions pool multiple years and include year fixed effects. 90% confidence intervals are based on Conley standard errors with a Bartlett kernel and cutoff values of 25 km and 20 years.

Figure B2: Varying the Range of Spillover Effects

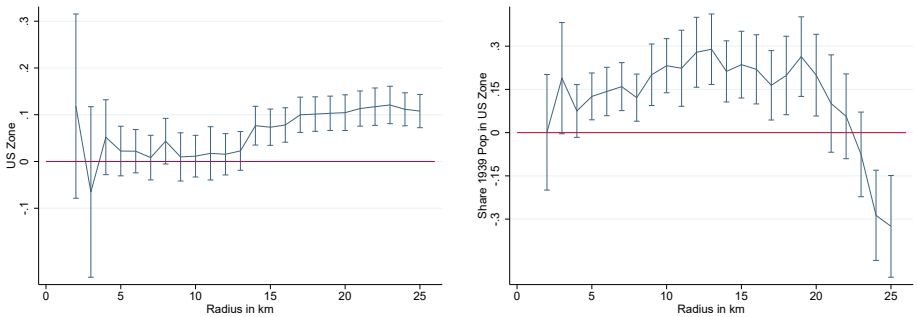
(a) Aggregate Income (2007-2017)



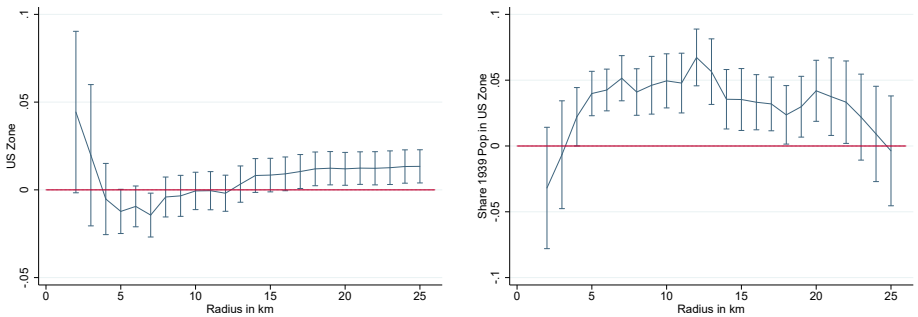
(b) Aggregate Productivity (2006-2018)



(c) Rents ImmobilienScout24 (2008-2016)



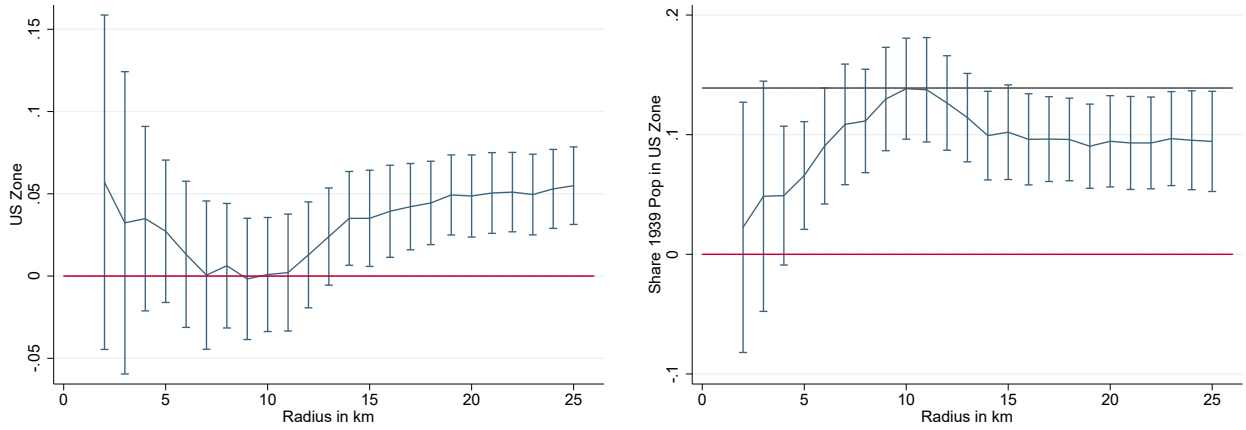
(d) Share University (1999-2020)



θ in equation (2) δ in equation (2)

Notes: The figure plots the coefficients θ and δ in equation (2) using different radii to obtain our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone within a certain distance of municipality centers. δ is the effect of our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone within the radius while θ is the effect for a (hypothetical) municipality that is on the former US side of the border between the 1945-1949 French and US occupation zones but close enough to the border that half of the pre-WWII population within the radius is on what became the French side of the 1945-1949 occupation-zone border. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. All regressions pool multiple years and include year fixed effects. 90% confidence intervals are based on Conley standard errors with a Bartlett kernel and cutoff values of 25 km and 20 years.

Figure B3: Understanding Estimates of the Range of Spillover Effects



θ in equation (2)

δ in equation (2)

Notes: This figure shows results of a simulation exercise for municipalities in a 15 km bandwidth around the border between the 1945-1949 French and US occupation zones in Baden-Württemberg. We first use equation (B1) to generate a synthetic outcome variable. The outcome is solely determined by the share of 1939 population within a 10 km circle (the true range of spillovers in the simulation exercise) around municipality centers on what would become the 1945-1949 US occupation zone. We then estimate equation (B2) for the synthetic outcome variable and vary the radius used to calculate our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone between 2 and 25 km. Average point estimates and 90% confidence intervals across 100 simulations are shown for the US zone indicator variable (θ, on the left) and for the measure of wider exposure to the arrival of refugees in 1945-1949 US occupation zone (δ, on the right).

Table B1: Sensitivity of the Results for Aggregate Income (2007-2017)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Standard Errors	Baseline		Robust		Cluster Municip.		Cluster County			
US Zone	0.014	-0.025	0.014*	-0.025**	0.014	-0.025	0.014	-0.025		
	(0.018)	(0.023)	(0.007)	(0.010)	(0.018)	(0.024)	(0.018)	(0.016)		
Share 1939 Pop in US Zone (within 10km)		0.139***		0.139***		0.139***		0.139**		
		(0.046)		(0.019)		(0.047)		(0.049)		
Observations	1,519	1,519	1,519	1,519	1,519	1,519	1,519	1,519		
	Conley 2km		Conley 10km		Conley 50km		Conley 75km		Conley 100km	
US Zone	0.014	-0.025	0.014	-0.025	0.014	-0.025	0.014	-0.025	0.014	-0.025
	(0.018)	(0.024)	(0.018)	(0.024)	(0.018)	(0.023)	(0.018)	(0.023)	(0.018)	(0.023)
Share 1939 Pop in US Zone (within 10km)		0.139***		0.139***		0.139***		0.139***		0.139***
		(0.047)		(0.047)		(0.045)		(0.044)		(0.044)
Observations	1,519	1,519	1,519	1,519	1,519	1,519	1,519	1,519	1,519	1,519
Panel B: RD Polynomial			Multidimensional Polynomial				One-Dimensional RD			
	Uniform Kernel		Quadratic		Cubic		Linear		Quadratic	
US Zone	0.029	-0.028	0.016	-0.024	-0.006	-0.036*	-0.024	-0.036	-0.042	-0.032
	(0.019)	(0.024)	(0.018)	(0.023)	(0.018)	(0.021)	(0.022)	(0.024)	(0.037)	(0.037)
Share 1939 Pop in US Zone (within 10km)		0.169***		0.139***		0.124***		0.107**		0.109*
		(0.045)		(0.046)		(0.045)		(0.054)		(0.059)
Observations	1,526	1,526	1,519	1,519	1,519	1,519	1,519	1,519	1,519	1,519
Panel C: Boundary Segments	1		2		10		25		50	
US Zone	0.023	-0.021	0.019	-0.021	0.011	-0.027	-0.002	-0.037*	-0.008	-0.053***
	(0.017)	(0.023)	(0.017)	(0.023)	(0.018)	(0.023)	(0.015)	(0.020)	(0.014)	(0.016)
Share 1939 Pop in US Zone (within 10km)		0.149***		0.140***		0.132***		0.134***		0.173***
		(0.044)		(0.045)		(0.049)		(0.045)		(0.037)
Observations	1,519	1,519	1,519	1,519	1,519	1,519	1,519	1,519	1,519	1,519
Panel D: Control Variables	Dismantling		Distance to Border							
US Zone	0.013	-0.028	-0.031	-0.042*						
	(0.018)	(0.022)	(0.023)	(0.024)						
Share 1939 Pop in US Zone (within 10km)		0.141***		0.102*						
		(0.045)		(0.053)						
Share Dismantled Establishments	-1.139	-1.939								
	(3.785)	(3.927)								
Distance to 1945-1949 Border			0.008***	0.005*						
			(0.003)	(0.003)						
Observations	1,519	1,519	1,519	1,519						

Notes: The table contains a sensitivity analysis of our baseline results in Table 2, Panel A. These results are based on local linear regressions with a triangular kernel, a bandwidth of 15 km around the border, and control for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. All regressions pool multiple years and include year fixed effects. In the baseline, standard errors are Conley standard errors with a Bartlett kernel and cutoff values of 25 km and 20 years. Panel A varies how we compute standard errors. We use heteroscedasticity-robust standard errors, clustering by municipality, and clustering by county. We also vary the spatial cutoff used in estimating Conley standard errors. Panel B varies the kernel used in the local linear regression and the RD polynomial. For the multidimensional polynomial, we examine the sensitivity to quadratic and cubic specifications in the coordinates. In addition, we consider a one-dimensional polynomial in the linear and quadratic distance to the border (estimated separately on each side of the border). Panel C varies the number of boundary segments used in the estimation. Panel D varies the control variables included in the regression. Distance to the border is defined as the distance to the border for municipalities in the 1945-1949 US occupation zone and negative distance to the border for municipalities in the 1945-1949 French occupation zone.

Table B2: Sensitivity of the Results for Aggregate Productivity (2006-2018)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Standard Errors	Baseline		Robust		Cluster Municip.		Cluster County			
US Zone	0.130**	0.053	0.130***	0.053**	0.130**	0.053	0.130**	0.053		
	(0.057)	(0.065)	(0.019)	(0.022)	(0.058)	(0.066)	(0.047)	(0.055)		
Share 1939 Pop in US Zone (within 10km)		0.270*		0.270***		0.270*		0.270		
		(0.148)		(0.049)		(0.150)		(0.181)		
Observations	2,558	2,558	2,558	2,558	2,558	2,558	2,558	2,558		
	Conley 2km		Conley 10km		Conley 50km		Conley 75km		Conley 100km	
US Zone	0.130**	0.053	0.130**	0.053	0.130**	0.053	0.130**	0.053	0.130**	0.053
	(0.058)	(0.065)	(0.057)	(0.065)	(0.056)	(0.064)	(0.056)	(0.064)	(0.055)	(0.064)
Share 1939 Pop in US Zone (within 10km)		0.270*		0.270*		0.270*		0.270*		0.270*
		(0.149)		(0.148)		(0.147)		(0.147)		(0.147)
Observations	2,558	2,558	2,558	2,558	2,558	2,558	2,558	2,558	2,558	2,558
Panel B: RD Polynomial			Multidimensional Polynomial				One-Dimensional RD			
	Uniform Kernel		Quadratic		Cubic		Linear		Quadratic	
US Zone	0.145**	0.066	0.129**	0.051	0.139**	0.057	0.134*	0.094	0.100	0.135
	(0.059)	(0.066)	(0.057)	(0.066)	(0.064)	(0.068)	(0.074)	(0.074)	(0.108)	(0.108)
Share 1939 Pop in US Zone (within 10km)		0.233		0.272*		0.341**		0.359**		0.384**
		(0.144)		(0.148)		(0.157)		(0.176)		(0.184)
Observations	2,570	2,570	2,558	2,558	2,558	2,558	2,558	2,558	2,558	2,558
Panel C: Boundary Segments	1		2		10		25		50	
US Zone	0.134**	0.066	0.141**	0.065	0.138**	0.063	0.166***	0.068	0.170***	0.052
	(0.056)	(0.065)	(0.057)	(0.066)	(0.057)	(0.067)	(0.057)	(0.068)	(0.055)	(0.063)
Share 1939 Pop in US Zone (within 10km)		0.227		0.264*		0.264*		0.373**		0.452***
		(0.146)		(0.148)		(0.146)		(0.160)		(0.143)
Observations	2,558	2,558	2,558	2,558	2,558	2,558	2,558	2,558	2,558	2,558
Panel D: Control Variables	Dismantling		Distance to Border							
US Zone	0.130**	0.051	0.127*	0.091						
	(0.058)	(0.064)	(0.076)	(0.075)						
Share 1939 Pop in US Zone (within 10km)		0.272*		0.354**						
		(0.146)		(0.174)						
Share Dismantled Establishments	-0.318	-1.850								
	(6.278)	(6.889)								
Distance to 1945-1949 Border			0.001	-0.011						
			(0.009)	(0.010)						
Observations	2,558	2,558	2,558	2,558						

Notes: The table contains a sensitivity analysis of our baseline results in Table 2, Panel B. These results are based on local linear regressions with a triangular kernel, a bandwidth of 15 km around the border, and control for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. All regressions pool multiple years and include year fixed effects. In the baseline, standard errors are Conley standard errors with a Bartlett kernel and cutoff values of 25 km and 20 years. Panel A varies how we compute standard errors. We use heteroscedasticity-robust standard errors, clustering by municipality, and clustering by county. We also vary the spatial cutoff used in estimating Conley standard errors. Panel B varies the kernel used in the local linear regression and the RD polynomial. For the multidimensional polynomial, we examine the sensitivity to quadratic and cubic specifications in the coordinates. In addition, we consider a one-dimensional polynomial in the linear and quadratic distance to the border (estimated separately on each side of the border). Panel C varies the number of boundary segments used in the estimation. Panel D varies the control variables included in the regression. Distance to the border is defined as the distance to the border for municipalities in the 1945-1949 US occupation zone and negative distance to the border for municipalities in the 1945-1949 French occupation zone.

Table B3: Sensitivity of the Results for Rents (2008-2016)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Standard Errors	Baseline		Robust		Cluster Municip.		Cluster County			
US Zone	0.120***	0.011	0.120***	0.011***	0.120***	0.011	0.120***	0.011		
	(0.026)	(0.027)	(0.002)	(0.002)	(0.024)	(0.027)	(0.036)	(0.037)		
Share 1939 Pop in US Zone (within 10km)		0.232***		0.232***		0.232***		0.232***		
		(0.057)		(0.003)		(0.057)		(0.061)		
Observations	314,765	314,765	314,765	314,765	314,765	314,765	314,765	314,765		
	Conley 2km		Conley 10km		Conley 50km		Conley 75km		Conley 100km	
US Zone	0.120***	0.011	0.120***	0.011	0.120***	0.011	0.120***	0.011	0.120***	0.011
	(0.024)	(0.027)	(0.025)	(0.027)	(0.027)	(0.027)	(0.027)	(0.026)	(0.026)	(0.026)
Share 1939 Pop in US Zone (within 10km)		0.232***		0.232***		0.232***		0.232***		0.232***
		(0.057)		(0.057)		(0.058)		(0.057)		(0.056)
Observations	314,765	314,765	314,765	314,765	314,765	314,765	314,765	314,765	314,765	314,765
Panel B: RD Polynomial			Multidimensional Polynomial				One-Dimensional RD			
	Uniform Kernel		Quadratic		Cubic		Linear		Quadratic	
US Zone	0.130***	-0.004	0.107***	0.010	0.065***	0.010	0.046*	0.006	0.073	0.054
	(0.028)	(0.031)	(0.022)	(0.027)	(0.020)	(0.023)	(0.028)	(0.022)	(0.050)	(0.044)
Share 1939 Pop in US Zone (within 10km)		0.250***		0.212***		0.212***		0.157**		0.173***
		(0.057)		(0.054)		(0.050)		(0.062)		(0.054)
Observations	315,111	315,111	314,765	314,765	314,765	314,765	314,765	314,765	314,765	314,765
Panel C: Boundary Segments	1		2		10		25		50	
US Zone	0.072**	-0.034	0.121***	0.016	0.108***	-0.016	0.068***	-0.001	0.061***	0.001
	(0.033)	(0.036)	(0.028)	(0.027)	(0.024)	(0.030)	(0.019)	(0.021)	(0.019)	(0.019)
Share 1939 Pop in US Zone (within 10km)		0.230***		0.226***		0.262***		0.168***		0.148***
		(0.080)		(0.055)		(0.057)		(0.042)		(0.046)
Observations	314,765	314,765	314,765	314,765	314,765	314,765	314,765	314,765	314,765	314,765
Panel D: Control Variables	Dismantling		Distance to Border							
US Zone	0.116***	0.032	0.017	-0.018						
	(0.021)	(0.025)	(0.031)	(0.026)						
Share 1939 Pop in US Zone (within 10km)		0.181***		0.140*						
		(0.047)		(0.073)						
Share Dismantled Establishments	18.959***	15.095***								
	(6.793)	(5.780)								
Distance to 1945-1949 Border			0.014***	0.010**						
			(0.003)	(0.004)						
Observations	314,765	314,765	314,765	314,765						

Notes: The table contains a sensitivity analysis of our baseline results in Table 2, Panel C. These results are based on local linear regressions with a triangular kernel, a bandwidth of 15 km around the border, and control for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. All regressions pool multiple years and include year fixed effects. In the baseline, standard errors are Conley standard errors with a Bartlett kernel and cutoff values of 25 km and 20 years. Panel A varies how we compute standard errors. We use heteroscedasticity-robust standard errors, clustering by municipality, and clustering by county. We also vary the spatial cutoff used in estimating Conley standard errors. Panel B varies the kernel used in the local linear regression and the RD polynomial. For the multidimensional polynomial, we examine the sensitivity to quadratic and cubic specifications in the coordinates. In addition, we consider a one-dimensional polynomial in the linear and quadratic distance to the border (estimated separately on each side of the border). Panel C varies the number of boundary segments used in the estimation. Panel D varies the control variables included in the regression. Distance to the border is defined as the distance to the border for municipalities in the 1945-1949 US occupation zone and negative distance to the border for municipalities in the 1945-1949 French occupation zone.

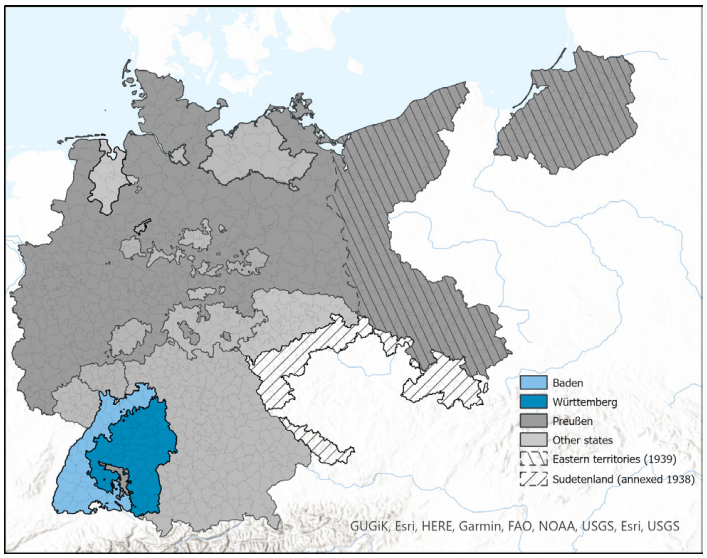
Table B4: Sensitivity of the Results for Share University Education (1999-2020)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Standard Errors	Baseline		Robust		Cluster Municip.		Cluster County			
US Zone	0.013**	-0.001	0.013***	-0.001	0.013**	-0.001	0.013	-0.001		
	(0.006)	(0.006)	(0.001)	(0.002)	(0.006)	(0.006)	(0.009)	(0.009)		
Share 1939 Pop in US Zone (within 10km)		0.049***		0.049***		0.049***		0.049***		
		(0.012)		(0.003)		(0.012)		(0.014)		
Observations	4,786	4,786	4,786	4,786	4,786	4,786	4,786	4,786		
	Conley 2km		Conley 10km		Conley 50km		Conley 75km		Conley 100km	
US Zone	0.013**	-0.001	0.013**	-0.001	0.013**	-0.001	0.013**	-0.001	0.013**	-0.001
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Share 1939 Pop in US Zone (within 10km)		0.049***		0.049***		0.049***		0.049***		0.049***
		(0.012)		(0.013)		(0.012)		(0.012)		(0.012)
Observations	4,786	4,786	4,786	4,786	4,786	4,786	4,786	4,786	4,786	4,786
Panel B: RD Polynomial			Multidimensional Polynomial				One-Dimensional RD			
	Uniform Kernel		Quadratic		Cubic		Linear		Quadratic	
US Zone	0.020***	-0.003	0.015***	0.001	0.003	-0.005	0.000	-0.004	-0.012	-0.009
	(0.007)	(0.007)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.011)	(0.011)
Share 1939 Pop in US Zone (within 10km)		0.065***		0.048***		0.032**		0.038***		0.037**
		(0.014)		(0.013)		(0.014)		(0.014)		(0.014)
Observations	4,808	4,808	4,786	4,786	4,786	4,786	4,786	4,786	4,786	4,786
Panel C: Boundary Segments	1		2		10		25		50	
US Zone	0.015***	0.002	0.016***	0.002	0.014**	0.003	0.007	-0.000	0.003	-0.004
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.006)	(0.005)
Share 1939 Pop in US Zone (within 10km)		0.046***		0.049***		0.039***		0.027**		0.028**
		(0.014)		(0.012)		(0.014)		(0.012)		(0.013)
Observations	4,786	4,786	4,786	4,786	4,786	4,786	4,786	4,786	4,786	4,786
Panel D: Control Variables	Dismantling		Distance to Border							
US Zone	0.013**	-0.002	-0.007	-0.010						
	(0.006)	(0.006)	(0.007)	(0.007)						
Share 1939 Pop in US Zone (within 10km)		0.051***		0.027**						
		(0.012)		(0.013)						
Share Dismantled Establishments	-0.924	-1.216								
	(1.194)	(1.103)								
Distance to Border			0.004***	0.003***						
			(0.001)	(0.001)						
Observations	4,786	4,786	4,786	4,786						

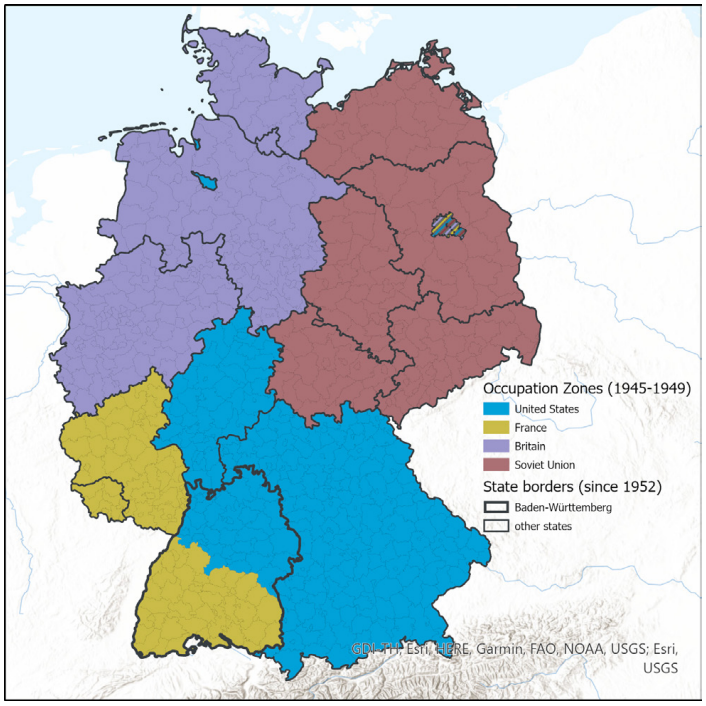
Notes: The table contains a sensitivity analysis of our baseline results in Table 2, Panel D. These results are based on local linear regressions with a triangular kernel, a bandwidth of 15 km around the border, and control for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. All regressions pool multiple years and include year fixed effects. In the baseline, standard errors are Conley standard errors with a Bartlett kernel and cutoff values of 25 km and 20 years. Panel A varies how we compute standard errors. We use heteroscedasticity-robust standard errors, clustering by municipality, and clustering by county. We also vary the spatial cutoff used in estimating Conley standard errors. Panel B varies the kernel used in the local linear regression and the RD polynomial. For the multidimensional polynomial, we examine the sensitivity to quadratic and cubic specifications in the coordinates. In addition, we consider a one-dimensional polynomial in the linear and quadratic distance to the border (estimated separately on each side of the border). Panel C varies the number of boundary segments used in the estimation. Panel D varies the control variables included in the regression. Distance to the border is defined as the distance to the border for municipalities in the 1945-1949 US occupation zone and negative distance to the border for municipalities in the 1945-1949 French occupation zone.

C Additional Figures and Tables

Figure C1: Germany before and after WWII



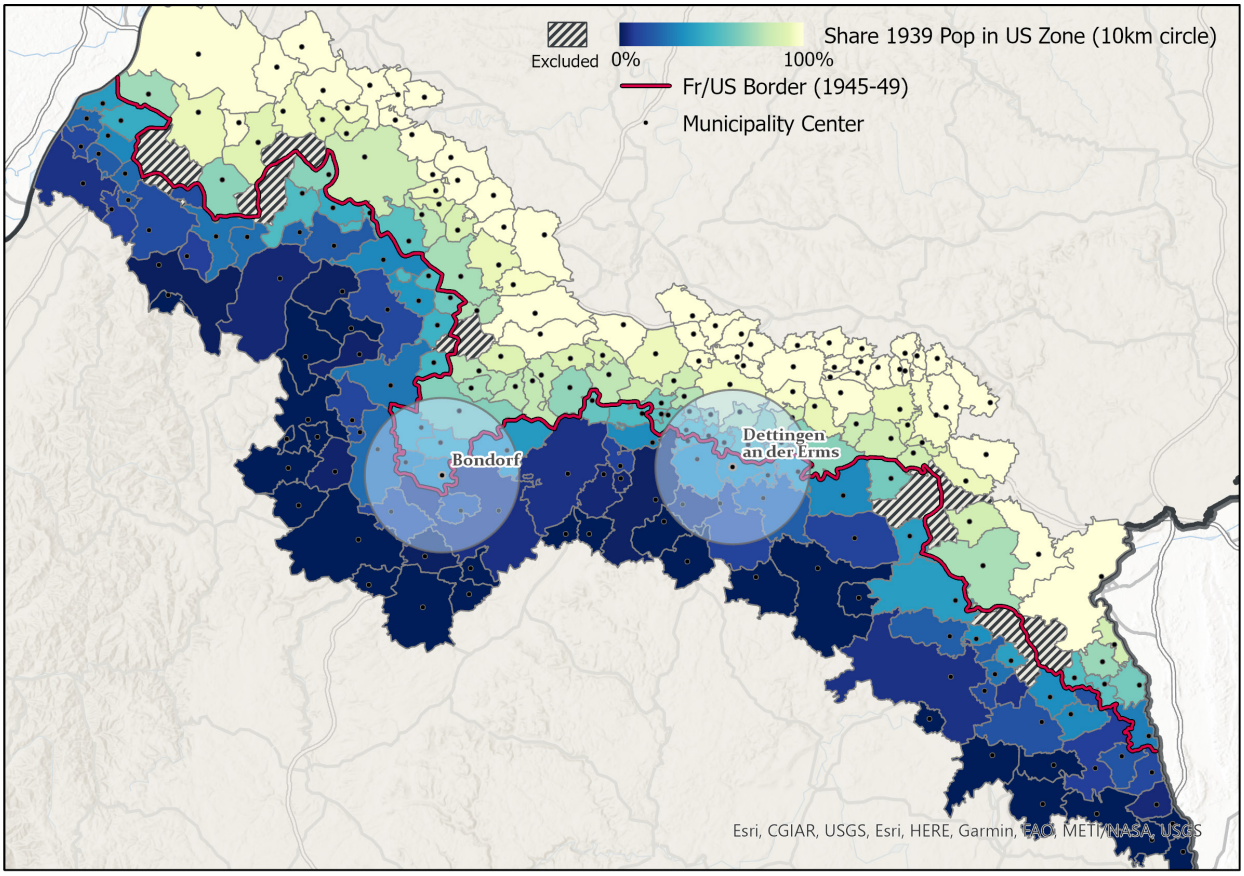
(a) Germany in 1939



(b) Germany after WWII

Notes: Figure (a) shows the pre-WWII borders of Germany in 1939. The shaded areas mark the eastern territories of pre-WWII Germany and some territories annexed in the years just before WWII that had to be ceded after WWII. The map also shows the historical states of Baden and Württemberg, the two states that together form the focal area of our paper. Figure (b) depicts the borders of the Federal Republic of Germany today and the four occupation zones that existed between 1945 and the foundation of the Federal Republic of Germany in 1949. The dark boundaries mark the 16 federal states, while the thicker boundary corresponds to the state of Baden-Württemberg, founded in 1952. The border between the 1945-1949 French and US occupation zones we focus on is the border within Baden-Württemberg.

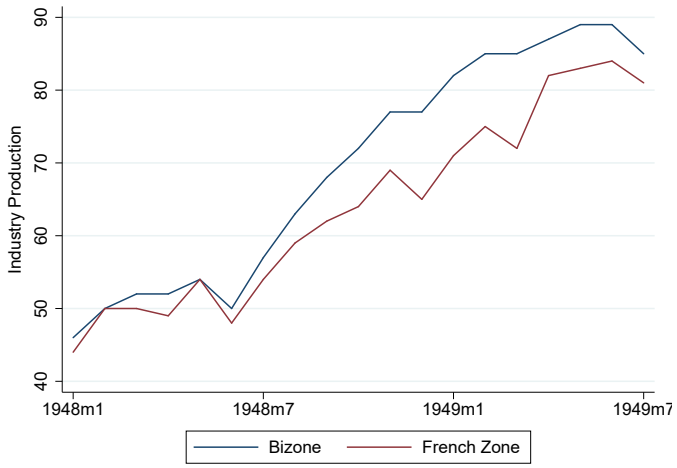
Figure C2: Illustrating the Measure of Wider Exposure to the Arrival of WWII Refugees



Notes: The figure illustrates our measure of wider exposure to the arrival of refugees in the 1945-1949 US occupation zone in South-West Germany. The map shows municipalities within 15 km of the 1945-1949 border between occupation zones and the location of their municipality centers. Municipalities are colored according to the share of the 1939 population within a 10 km radius around municipality centers that lived on what would become the US side of the 1945-1949 border. To construct the share for a municipality m, we first obtain all municipalities whose center is located within a circle with a radius of 10 km around m. Then, we compute the sum of the population in 1939 in municipalities within the circle that would become part of the 1945-1949 US occupation zone and divide it by the total population within the circle. Lighter colors denote higher shares of 1939 population in what became the US occupation zone. We use the 1939 population as this captures basic determinants of where refugees could potentially settle, but avoids endogeneity issues related to where refugees actually settled within the US and within the French occupation zones.

The two circles shown in the figure are centered on the municipalities of Bondorf (circle on the left) and of Dettingen an der Erms (circle on the right). Both are located close to the 1945-1949 border. Bondorf was in the US occupation zone, whereas Dettingen was in the French occupation zone. Bondorf has 30% of the 1939 population within its circle in what became the US occupation zone. Dettingen has 40% of the 1939 population within its circle on what became the US occupation zone. Hence, the wider exposure to the arrival of WWII refugees in the US occupation zone is larger for Dettingen than Bondorf, although Dettingen was in the French zone whereas Bondorf was in the US zone.

Figure C3: Industrial Production 1948-49 (Ritschl, 1985)

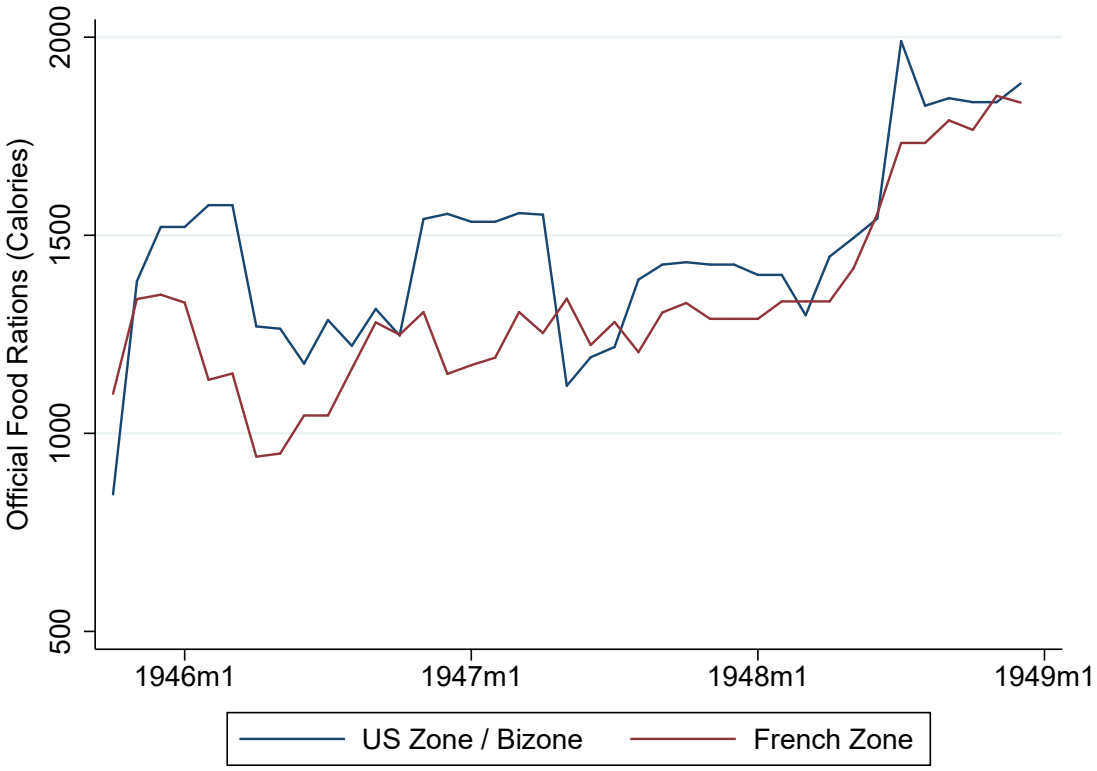


Total Production (1936=100)

Production per Worker (1936=100)

Notes: The figure on the left reproduces the index of total industrial production (1936=100) as calculated by Ritschl (1985) for the Bizone (the combined UK and US occupation zone) and the French occupation zone. The figure on the right is meant to approximate an index of industrial productivity (1936=100) and is obtained by adjusting industrial production in 1936 by the number of workers in industry and handicrafts in 1939 and industrial production in 1948-1949 by the number of workers in industry and handicrafts in 1950. The employment data comes from Vonyó (2018). We use employment in 1939 and 1950 as there is no data for 1936 and 1948-1949.

Figure C4: Official Food Rations



Notes: The figure shows the caloric intake of official food rations in the French and US (Bizone from 1947) occupation zones. The data comes from Manz (1968) and Schlange-Schöningen (1955).

Table C1: Pre-WWII Characteristics of Refugees and Local Population in the 1945-1949 US Occupation Zone in South-West Germany (Grosser, 2006)

	Refugees	Locals	Difference
Education			
Years of education	8.4	8.6	-0.2
No elementary school degree	3.9	2.1	1.8
Elementary school degree	61.3	57.4	3.9
Vocational school degree	15.3	20.0	-4.7
Comprehensive school degree	13.6	13.6	0.0
High school degree	3.1	3.2	-0.1
University degree	2.4	3.0	-0.6
Employment and Occupational Status			
Employed	66.2	65.8	0.3
Self-employed farmers	7.9	4.7	3.1
Self-employed	5.4	5.3	0.1
Family members working in family businesses	9.2	7.0	2.2
Civil servants	4.1	4.8	-0.7
White-collar workers	10.1	13.7	-3.6
Unskilled blue-collar workers	17.8	17.8	0.1
Skilled blue-collar workers	11.1	10.7	-0.4
Foremen	1.0	1.5	-0.5
Unemployed	0.1	0.1	0.0
Out of labor force	27.0	26.6	0.4

Notes: The table reproduces the data in Grosser (2006) for refugees and the local population in the former US occupation zone in Baden-Württemberg. The original source is the supplementary micro census in 1971 (*Mikrozensus Zusatzerhebung "Berufliche und soziale Umschichtungen der Bevölkerung"*). Education refers to the highest educational degree in 1971 for individuals born before 1930. Employment and occupational status in 1939 is retrospective information for individuals born before 1920. The sample consists of individuals who lived in the 1945-1949 US occupation zone in 1971 and therefore also captures relocation after the initial arrival of refugees.

Table C2: Education in 1970 - Other Levels

	(1)	(2)	(3)	(4)
	Share High-School Degree		Share Vocational Degree	
US Zone	0.010	0.034	-0.004	-0.022
	(0.024)	(0.026)	(0.024)	(0.027)
Share 1939 Pop in US Zone (within 10km)		-0.086**		0.065
		(0.042)		(0.043)
Observations	218	218	218	218

Notes: This table examines the share of residents in 1970 who have a high-school degree and the share of residents in 1972 who have a vocational degree. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. The analysis includes municipalities within 15 km of the 1945-1949 occupation-zone border. Standard errors are Conley standard errors with a Bartlett kernel and cutoff values of 25 km and 20 years.

Table C3: Adjustments in Manufacturing Share before 1971 - Controlling for Industry Dismantling

	(1)	(2)	(3)
	Annual Growth		
	1933/39-1950	1950-1960	1960-1970
US Zone	0.005***	-0.003***	0.001
	(0.001)	(0.001)	(0.002)
Share Dismantled Establishments	-0.198	-0.120	-0.764**
	(0.304)	(0.127)	(0.321)
Observations	217	217	217

Notes: This table examines changes in the manufacturing employment over different periods. In addition to the specification in Panel D of Table 4, we control for the share of dismantled establishments. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. The analysis includes municipalities within 15 km of the 1945-1949 occupation-zone border. Standard errors are Conley standard errors with a Bartlett kernel and a cutoff value of 25 km.

Table C4: Tax Rates at the Municipality Level

	(1)	(2)	(3)	(4)	(5)	(6)
	1950		1960		1970	
Business Tax Rate						
US Zone	-0.063	-0.080	-0.002	-0.006	0.006	0.001
	(0.054)	(0.060)	(0.014)	(0.017)	(0.012)	(0.008)
Share 1939 Pop in US Zone (within 10km)		0.060		0.013		0.018
		(0.063)		(0.025)		(0.020)
Observations	613	613	613	613	591	591
Land Tax Rate, Type A						
US Zone	-0.220***	-0.265***	-0.008	-0.028	0.018	0.008
	(0.039)	(0.029)	(0.031)	(0.038)	(0.031)	(0.025)
Share 1939 Pop in US Zone (within 10km)		0.157**		0.070		0.037
		(0.075)		(0.062)		(0.045)
Observations	611	611	611	611	599	599
Land Tax Rate, Type B						
US Zone	-0.171***	-0.255***	0.034	0.007	0.038**	0.019
	(0.037)	(0.042)	(0.031)	(0.044)	(0.019)	(0.023)
Share 1939 Pop in US Zone (within 10km)		0.296**		0.095		0.069**
		(0.125)		(0.074)		(0.030)
Observations	611	611	611	611	599	599

Notes: The table examines the three main tax rates set at the municipality level: a local business tax and two land taxes (type A for agricultural land, type B for non-agricultural land). These tax rates are customarily expressed as multiples of a state-wide base rate. Estimates refer to differences across the border between the 1945-1949 French and US occupation zones. All regressions are local linear regressions controlling for longitude and latitude, quadratic polynomials in distance to Stuttgart and to the closest highway exit in 1940, and five boundary segment fixed effects. Standard errors are Conley standard errors with a Bartlett kernel and a cutoff value of 25 km. The analysis includes municipalities within 15 km of the border between the 1945-1949 French and US occupation zones. Due to the inherent difficulty of aggregating tax rates across municipalities, the analysis considers municipalities as defined before the territorial reform in the early 1970s. We observe no significant difference in the local business tax rates across the 1945-1949 border. Land tax rates in 1950 are lower on what had been the US side of the 1945-1949 border. In 1960 and 1970, land tax rates are either higher on the former US side or differences are statistically insignificant.

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