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THE ECONOMIC LEGACY OF EXPULSION: LESSONS FROM POST-WAR CZECHOSLOVAKIA*

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This article examines the long-run effects of forced migration on economic development in the origin economy, using Czechoslovakia's expulsion of three million Germans after WWII. For identification, I use the discontinuity in ethnic composition at the border of the *Sudetenland* region where Germans lived. Germans had similar characteristics to Czechs, bypassing factors driving effects in other cases of forced migration, such as differences in human capital. The expulsion produced persistent disparities in population density, sector composition and educational attainment. I trace effects to selective initial resettlements and capital extraction following the expulsion, culminating in urban decay and human capital decline.

Between 1945 and 1947, three million Germans were expelled from Czechoslovakia, in one of the largest waves of forced migration in history. Yet this event was hardly unique. Countless others, including millions of Jews, Greeks and Turks, were likewise uprooted during the twentieth century in the process of nation-building, while civil and ethnic conflict have more recently driven large-scale population outflows in places like Uganda, Bosnia, Syria and Myanmar. A large literature has documented the impact of such events, both on forced migrants, who often experience continued persecution abroad as refugees and on their host economies (Ruiz and Vargas-Silva, 2013; Becker *et al.*, 2020).

What, however, becomes of the places left behind? Comparably little work has been done to understand how forced migration affects the economic development of places *at origin*, i.e., from which the displacement occurred. In this article, I examine such effects over the long-run, using Czechoslovakia's expulsion of three million Germans after WWII. This event has several features which turn out to be well-suited for identifying the effects of a forced migration event in ways that prior literature has not. Following the collapse of Austria-Hungary into nation states in 1918, those identifying as German within the Czech lands (i.e., the modern day Czech

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The data and codes for this paper are available on the Journal website. They were checked for their ability to reproduce the results presented in the paper. The authors were granted an exemption to publish parts of their data because access to these data is restricted. However, the authors provided the Journal with temporary access to the data, which enabled the Journal to run their codes. The codes for the parts subject to exemption are also available on the Journal website. The restricted access data and these codes were also checked for their ability to reproduce the results presented in the article.

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Republic) were concentrated in one region—the borderlands, or *Sudetenland*—distinguished by a distinct 'language border'. Yet after centuries of coexistence and common rule, during which language had held little economic or social significance among the masses, Germans and Czechs were highly similar in terms of their economic and cultural characteristics (Zahra, 2008). This language border was made formal in 1938 with the Munich Agreement, which paved the way for Germany's occupation of the Czech lands and in turn Czechoslovakia's expulsion of its German population in 1945.

My identification strategy exploits the discontinuity in regional exposure to the expulsion at this boundary to identify its relative impact on local economic development over the long-run.[1] To do this, I construct a new data set of municipal- and district-level data spanning nine decades. Using directories of Czech villages from during the war, I divide the Czech lands into a *borderlands* region where Germans lived prior to the expulsion and an *interior* region in which they largely did not. I then examine economic outcomes in the borderlands, relative to interior areas nearby. To the extent that regions were historically similar at the boundary prior to the expulsion, differences at the boundary thereafter reveal the expulsion's relative effects.[2] The prospect of similar treated and control areas also presents a unique opportunity to examine the mechanisms through which forced migration affects regional development. In other cases of forced migration, differences in factors such as skill composition tend to distinguish displaced populations, driving effects (Acemoglu *et al.*, 2011; Chaney and Hornbeck, 2016). In contrast, the effects of forced migration in this setting are a priori ambiguous. Namely, it is not clear whether depopulation will be followed by convergence (Davis and Weinstein, 2002; 2008), with migration restoring pre-existing spatial patterns of economic activity at the boundary, or by a permanent redistribution of activity to unaffected regions (Bosker *et al.*, 2007; Bleakley and Lin, 2012), given the large negative shock to borderland agglomerations. This article seeks to answer this question and, if it is the latter, chart the precise channels driving persistence.

I begin by combining historical evidence and data on a large set of socioeconomic variables from the interwar period to confirm that places with many Germans and nearby places with few were otherwise highly similar prior to the expulsion on a number of relevant dimensions, such as literacy, income and sector composition. This is true even if one omits segments of the language border around which the borderlands was more ethnically mixed.

Next, I document large disparities in economic performance today between municipalities on either side of the old German language border. As of 2011, crossing into a borderland municipality from a nearby interior municipality is associated in main specifications with a decline in population density (↓ 36.6%); higher unemployment (↑ 26%); a lower share of employment in skill-intensive sectors such as finance (↓ 26.2%) and health care (↓ 21.2%); and a smaller share of the population with a college degree (↓ 22.2%). These findings are robust to changes in assumptions regarding bandwidth, running polynomial and fixed effects.

Lastly, studying a historical expulsion allows me to shed light on the precise channels through which such differences emerged and persisted. Contrary to policymakers' expectations that former-German areas could be fully and voluntarily resettled by Czechs from the largely unaffected interior, I show that the expulsion was followed by a *selective migratory response*. Settlers disproportionately migrated from interior areas nearby and were rural in origin relative to their

[1] Use of ethnic boundaries for empirical identification follows a recent literature, including Michalopoulos and Papaioannou (2013), Grosfeld *et al.* (2013), Eugster *et al.* (2017) and Moscona *et al.* (2020).

[2] Effects are best described as relative effects, which are likely smaller than the expulsion's absolute effects, due to migration and trade from the interior to the borderlands following the expulsion.

more urban destinations, with fewer workers arriving from skilled sectors such as transportation and business relative to agriculture. I argue that this is consistent with agglomeration spillovers keeping relatively urban workers concentrated in the interior after the expulsion. At the same time, I document a large-scale *removal of physical capital* from former-German areas following the expulsion. I argue that this stemmed not from WWII or the Soviet liberation of the Czech lands thereafter, but from an extractive environment engendered by the vacuum of property rights that followed the expulsion. Together, these forces culminated in widespread *urban decay*, with many settlements permanently abandoned, lowered population density and a shift in sectoral composition toward agriculture in former-German areas, as well as *human capital inequalities* between the regions, with relatively lower levels of enrollment in advanced secondary, technical and tertiary schooling present in the borderlands as early as mid-1947. I also consider other factors such as natural geography, central planning, market access and Cold War geopolitics.

The borderlands' decline was initially not intended by Czechoslovak policymakers, for whom the region had great economic importance. Yet the expulsion of the Germans had a persistent impact on the places in which they had once lived, relative to other places nearby. These findings provide valuable new insight into the economic effects of forced migration. While voluntary migration has been the subject of vast research and debate (Bell *et al.*, 2013; Abramitzky *et al.*, 2014), migration occurring due to expulsion as well as war and natural disaster is increasingly relevant, with the UN placing the number of forcibly displaced people at 80 million worldwide.[3] Moreover, forced migration is often followed by expropriation and conflict. Hence, it may have effects that differ from those of voluntary migration.

This article makes several contributions to the literature on forced migration. First, whereas existing research has focused largely on the effects of forced migration events for host countries (Hornung, 2014; Schumann, 2014; Johnson and Koyama, 2017; Braun *et al.*, 2020) or on migrants themselves (Bauer *et al.*, 2013; Becker *et al.*, 2020), the findings here provide new evidence that forced migration may affect regional development and contribute to spatial inequality in the origin economy overseeing such displacement (Becker and Ferrara, 2019). This is most similar to Chaney and Hornbeck (2016), who find delayed convergence following the Spanish expulsion of the Moriscos between former-Morisco and non-Morisco districts. As in their paper, studying a politically-motivated expulsion has advantages for identification here, as it is less likely to be associated with selection within the targeted group or the direct destruction of physical capital, relative to war or natural disaster.[4]

Second, to my knowledge this article contributes the first evidence that forced migration can have persistent effects even when treated and control groups are highly similar—in contrast to other settings, in which pre-existing differences in skill or other factors are key in driving spatial disparities following treatment (Acemoglu *et al.*, 2011; Chaney and Hornbeck, 2016).[5] Studying this event thus has the potential to speak to a more general class of forced migration events, in which such differences are not always present to impede convergence. Nevertheless, the findings here at times mirror other settings.[6] For instance, Acemoglu *et al.* (2011) find similarly persistent population effects. In contrast, Arbatli and Gokmen (2019) document a *positive* legacy

[3] See the United Nations High Commissioner for Refugees (2019).

[4] An estimated 7,000 German civilians were murdered by Czechs during the expulsion, and each expellee was allowed to take about 50 kg in property (Gerlach, 2017).

[5] Also see Waldinger (2010), Akbulut-Yuksel and Yuksel (2015); and Pascali (2016).

[6] Effects also mirror the literature on refugee and other migrant *inflows*, in which population increases often generate agglomeration or other spillovers that persist over the long-run (Foged and Peri, 2016; Rocha *et al.*, 2017; Droller, 2017; Murard and Sakalli, 2019; Peters, 2019; Sequeira *et al.*, 2019).

of historical Greek and Armenian human capital externalities in Turkey a century after the expulsions of those relatively high-skilled groups.

A third contribution to the forced migration literature is in documenting the regional economic impact of this significant forced migration event in history. That being said, several working papers study other important aspects of this event, complementing the work here. In particular, Semrad (2015) focuses on the host economies of Sudeten Germans and finds that their arrival in Bavaria generated educational spillovers, while Guzi *et al.* (2019) examine the migratory tendencies of those who resettled the borderlands and find that their settlements tend to be less permanent, stemming from less developed social capital.

Lastly, this article speaks to broader questions in development and urban economics regarding the importance of historical shocks for long-run development. Empirically, the findings contrast with Davis and Weinstein (2002; 2008), who argue against the empirical relevance of multiple equilibria in economic activity, showing on the contrary that relative city sizes recovered quickly in Japan following the destructive bombings of WWII.[7] Yet whereas that shock left property rights and ownership largely intact in affected cities (Nunn, 2014), none displaced by the expulsion here were around to help restore prior economic geography thereafter, leaving a vacuum of property rights in the interim. I argue that this paved the way for large-scale capital extraction, at the expense of regional recovery. This mirrors Ochsner (2017), who documents a persistent negative impact of Red Army pillaging of capital after WWII. This potentially offers an alternative explanation for the differential effects of population shocks as noted in Acemoglu *et al.* (2011), who attribute the Holocaust's persistent effects in Russia to structural changes stemming from compositional differences between expellees and non-expellees. Namely, the persistent effects of shocks may depend on how they affect such fundamental factors as property rights, as in Ochsner (2017) as well as Nunn (2008) and Feigenbaum *et al.* (2019).[8]

1. Historical Background

The origins of the 'Sudeten' Germans in the Czech borderlands can be traced to the twelfth century, when early Bohemian kings opened them up to immigration by German-speaking artisans (de Zayas, 1989). They would pay taxes but trade relatively freely, diffusing their language and culture in the process (Agnew, 2004).

After the Thirty Years' War, the Czech lands underwent further 'Germanisation' under Habsburg rule. During this time, more German speakers moved into the borderlands, creating vast German language frontiers (Daněk, 1995). Yet despite growing German hegemony among the elite, German and Czech speakers coexisted peacefully at the local level, where identity depended more on local kinships than on language (King, 2002; Tampke, 2003). German industries attracted Czech speakers to German towns, creating bilingual economic centres where intermarriage was not uncommon and language choice was situational (Agnew, 2004; Zahra, 2008). By the early 1800s, language was largely independent of economic, cultural, or even genetic factors among the masses (King, 2002; Zahra, 2008).

[7] On multiple equilibria, see Redding *et al.* (2011), Kline and Moretti (2014), Jedwab and Moradi (2016).

[8] Property rights for instance may help re-coordinate activity post-shock. See Acemoglu *et al.* (2002), Acemoglu and Dell (2010), Dell (2010), Hornbeck (2010) and Tabellini (2010), on history, institutions and development, and Maloney and Caicedo (2015), Dell and Olken (2019), Jedwab *et al.* (2019), and Testa (2020) for prior work on how agglomeration economies and institutions may interact to shape spatial development.

The formation of a German 'language border'

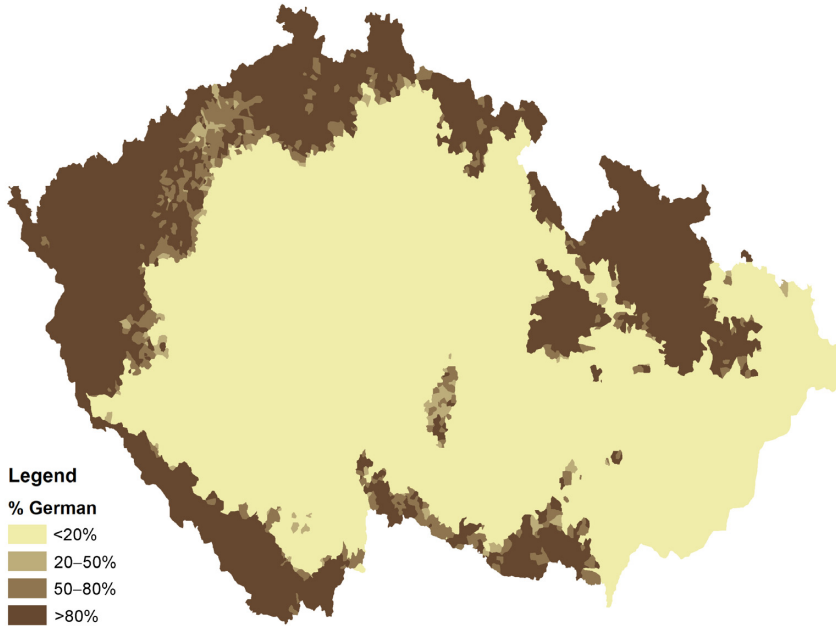
Though German and Czech speakers remained well-matched economically, a series of events resulted in their increased segregation within the Czech lands during the following century. From the late 1800s, nationalist activists worked to build exclusive societies by establishing language-based social associations and lobbying for reforms that limited bilingual education (Tampke, 2003; Judson, 2006; Zahra, 2008). These efforts often took on a geographic dimension. Because later Austrian censuses required citizens to select a single language of daily use, German nationalists developed a visual of the borderlands as a distinctly German region and aimed to 'Germanise' its mixed elements. Czech nationalists, in contrast, sought to preserve the historic boundaries of the Lands of the Bohemian Crown (i.e., the modern day Czech Republic) and built exclusively Czech-language institutions to combat Germanisation (Bryant, 2002; Zahra, 2008). As a result, much of activists' efforts focused on the more mixed areas where the borderlands met the Czech interior (Cornwall, 1994). And although the masses remained largely indifferent to national identification, the late nineteenth century indeed saw greater language assimilation in these places, including declining German speaking in interior areas (Agnew, 2004; Zahra, 2008).

The notion of the borderlands as a formal, German region was further legitimised in 1918 when it was included in official proposals for a new German–Austrian state (Agnew, 2004). When the Allies instead backed Czech efforts to keep historic boundaries intact, the inclusion of three million borderland German speakers as a minority group in the new Czechoslovak state further unified them around a cohesive 'Sudeten' German identity (Gerlach, 2017). Meanwhile, Czechoslovak policymakers could now use the state to influence the ethnolinguistic composition of the Czech lands. After 1918, a parent's nationality as it appeared on the census determined a child's language of instruction, with minority-language schooling and public services being provided only if a minority group exceeded 20% of the local population (Agnew, 2004; Zahra, 2008). Coinciding with this, census officials could choose nationalities for citizens based on 'objective' traits and punish failures to comply. In total, German population counts in mixed areas fell by 420,000 (Zahra, 2008). At least officially, over 90% of German speakers in the Czech lands lived in the borderlands in 1930.

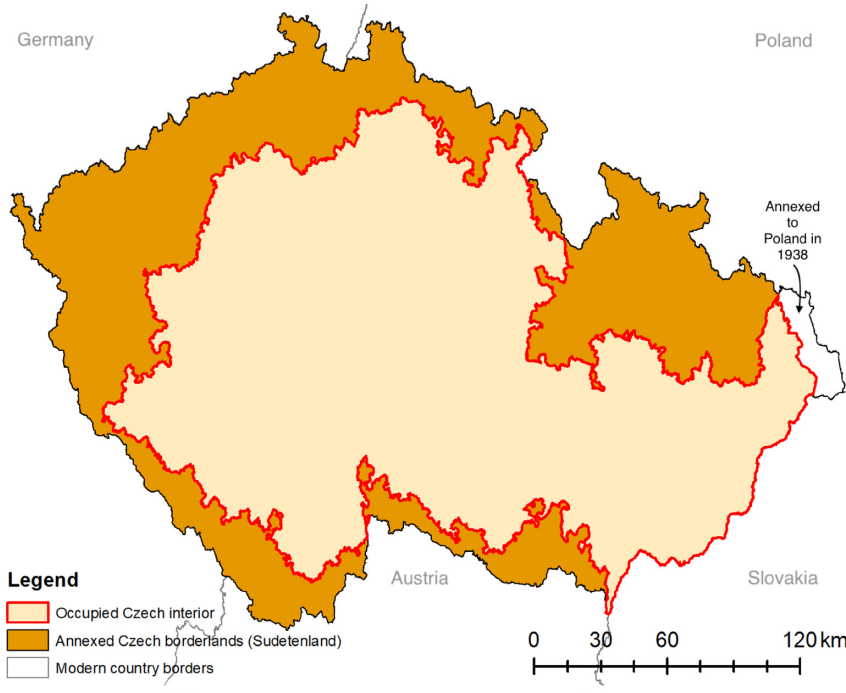
Though the interior was largely homogeneously Czech in official statistics after the 1921 census, parts of the borderlands remained quite mixed, and campaigns to influence the German 'language border' as depicted in the first part of Figure 1 continued until its formalisation with the Munich Agreement in 1938, which annexed all majority-German areas to Nazi Germany.[9] Parts of northeast Moravia even became minority-German in later years, as Czechs-identifiers moved to some borderland cities (Cornwall, 1994). However, Hitler's proposals at Munich ignored this, successfully arguing for Germany's annexation of borderland villages that had been majority-German in 1910, with boundaries shown in the second part of Figure 1.[10] In fact, they also called for plebiscites in territories that had never been majority-German, though these never came to fruition, as the interior was soon occupied as well (Armstrong, 1939; Goldstein, 1999). The 'fuzzy' nature of the language border in some areas, as it pertains to the analysis, is discussed in Section 3.

[9] See Figure A.13 for the MAL directly overlaid on this map.

[10] Note that Zaolzie in Cieszyn Silesia, a Polish-speaking area, was annexed by Poland in 1938. I exclude this area. See Figure A.1 in the Supplemental Material for a larger map of annexed territories within Europe.



(a) Germans in the Czech lands, pre-1945



(b) The Czech lands after the Munich Agreement

Fig. 1. *The German 'Language Border' and Munich Agreement Boundaries.*
Notes: Sources for top map are Winkler (1936), Wiskemann (1938) and Maier (2006). Bottom map shows the 'Munich Agreement line', constructed as described in Section 2.

Comparing Germans and Czechs, 1918–39

Prior to the Munich Agreement, issues of nationality did not dominate the political discourse in Czechoslovakia, and German and Czech societies functioned in relative political and economy harmony (Tampke, 2003). After centuries of coexistence and common rule, during which language differences had mattered little among the masses, newly-salient national labels remained largely uncorrelated with economic and cultural factors (Zahra, 2008).

For instance, Czechs had parity with Germans in *education* as of the early 1900s (Agnew, 2004; Zahra, 2008). Indeed, education was provided publicly to all by the Czechoslovak government, with parallel curricular structures across all language groups. At the same time, efforts were made to respect national distinctions. History and geography were adapted for different nationalities, and though it was a common elective, students in German-language schools were not obligated to learn Czech (Bach, 1923; Tampke, 2003).

Germans and Czechs also had similar standings in the *labour market* (Zahra, 2008). Though Czechoslovakia made up only a fifth of the Austrian Empire in territory, it constituted two thirds of its industrial capacity, with key production in both the borderlands and interior (Agnew, 2004). Germans deeper in the borderlands did specialise in light industry, such as glassmaking and textile weaving, although even in those sectors the majority of workers were non-German (Gerlach, 2017; US House Committee on Foreign Affairs, 1947).

Finally, Czechoslovak interwar *institutions* were relatively inclusive, inspired by the Swiss model (Tampke, 2003). Freedom of religion and the press, legal rights, and access to health care and education were universal across individuals (Bryant, 2002; Tampke, 2003). Group rights were somewhat weaker; facilities were provided for German-language schools and legal activities, though only in areas in which Germans exceeded 20% of the population, and Germans participated in parliamentary politics but were not guaranteed proportionate representation (Tampke, 2003; Zahra, 2008).

Such calm was short-lived. During the Great Depression, economic anxiety amplified German concerns about the Czechoslovak state. Export-heavy industries deep in the borderlands experienced some of the highest unemployment in Czechoslovakia, and many Germans blamed the Czechoslovak government. The separatist Sudeten German Party (SdP) was founded in October of 1933, and although the popular German political parties remained anti-separatist and coalesced with leading Czech parties on common issues in the 1920s, by 1938, 85% of Sudeten Germans supported the SdP (de Zayas, 1989; Glassheim, 2016).

Germany's proximity to the borderlands made its invasion highly likely. In an attempt to avoid war, Allied leaders signed the Munich Agreement, fully formalising the Sudetenland as a region. Meant to appease Germany, annexation severely weakened Czechoslovakia's military and industrial capacities (Agnew, 2004; Glassheim, 2016). Within a few months, Germany had occupied the remainder of the Czech lands, sending its government into exile.

The expulsion of the Sudeten Germans

During the war, exiled Czechoslovak president Edvard Beněs established the legal basis for the expulsion of all Germans through several decrees. Thousands of 'national committees' were to be set up throughout the borderlands to manage the expulsion, including the confiscation of German property without compensation and its allocation to incoming settlers. When the war ended in 1945, Allied forces moved into the borderlands to liberate Czechoslovakia, resulting in the first expulsions. It was not until June, however, that they would gain momentum. By summer's end, 800,000 Germans had been expelled. In August, following the formal Allied approval of

the expulsions at Potsdam, all remaining Germans were formally stripped of their citizenship. Another 2.2 million Germans were expelled through mid-1947 (Gerlach, 2017). These transfers were more systematic in comparison to the earlier 'wild transfers'. All borderland residents were suspected of being German. When in doubt, German or Czechoslovak censuses could determine whether one should be expelled. This meant that some Germans who had become Czechs by force prior to the war were not expelled, while some non-Germans who had 'switched' to German following annexation were. For others, having an ambiguous or mixed national identity meant being expelled, regardless of census identification (Zahra, 2008; Spurný, 2013). Only a small number of Germans who were Czech by marriage, could prove their loyalty to the state, or were deemed economically vital were allowed to stay. By 1950, three million Germans had been expelled, mainly to the Western Zones of occupied Germany, along with almost a million to the East Zone and 142,000 to Austria, and only 165,000 Germans remained, of which most would be re-granted citizenship (Cornwall, 1994; *Odsun: Die Vertreibung der Sudetendeutschen*, 1995).

The resettlement of the borderlands

The borderlands' resettlement was of central importance to the Czechoslovak government, which sought to maintain the region's pre-war output (Glassheim, 2016; Gerlach, 2017). In May 1945, the Czech borderlands contained upwards of 500,000 non-Germans, and the Czechoslovak government hoped 2.5 million more would arrive to resettle the region. Unlike those of other post-war expulsions, this process was to be voluntary. The Czechoslovak government saw this as important for ensuring the elimination of perceived differences between the interior and borderlands, with the hope that confiscated land and property could be used to spur a rapid and full resettlement. Settlers were to be made up solely of Czechs from nearby interior areas. However, as labour shortages ensued, policymakers recruited some Slovaks and others from abroad (Gerlach, 2017).

Resettlement began in 1945 alongside the expulsion. Early on, resettlement fed back into expulsion, with Germans kept for labour until settlers began to arrive. Various systems and incentives were introduced. Settlers could became 'national administrators' of larger firms and farms, with the prospect of eventual ownership. This was established as an interim institution to keep enterprises operating as settlers replaced expellees. To do so, one applied with a national committee with evidence of relevant knowledge or training, although in practice the allocation of property and titles was less careful (Gerlach, 2017). Other incentives were used to attract worker-settlers. Land and houses were sold at low prices;[11] stipends were given to workers in critical industries, such as mining; low interest loans were offered to farmer-settlers; and new regulations were issued, reducing rent in the borderlands relative to the interior by 25% and restricting it to up to 15% of household income for larger families. Ultimately, towns with the most appealing property, larger towns, and those closest to the interior were emptied and resettled most quickly (Daněk, 1995; Gerlach, 2017).

2. The Data

This section provides an overview of the district- and municipal-level data set compiled for this article. It spans over 90 years and contains newly- and already-digitised data from historical censuses, statistical journals, and demographic yearbooks.

[11] House prices were about 1 to 3 times annual rent, with 10% down (Wiedemann, 2016; Guzi *et al.*, 2019).

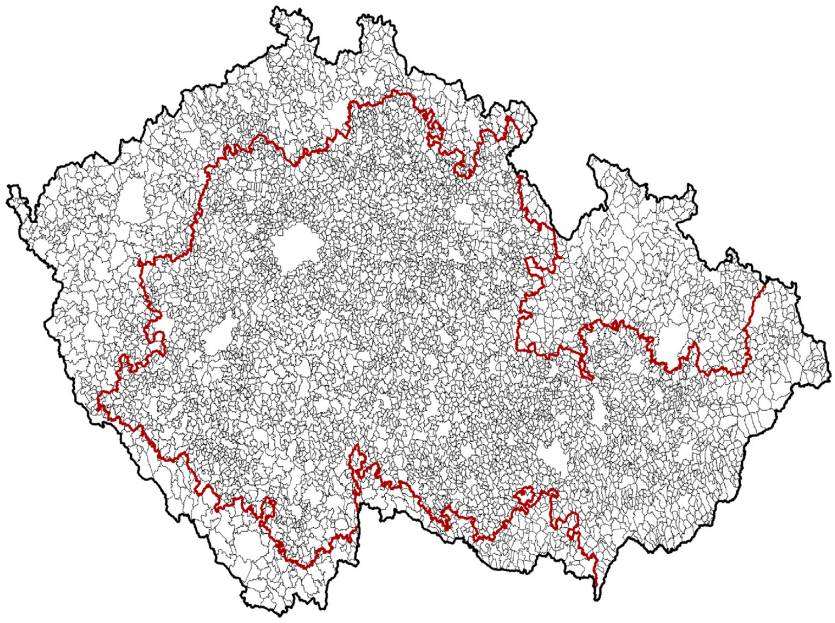


Fig. 2. *Munich Agreement Line (MAL) Overlaying Municipalities (as of 2011).*

The main 'treatment' variable in Section 3 (i.e., located in the borderlands, or former *Sudetenland*) is coded from two directories. As the primary source, I use *Amtliches Deutsches Ortsbuch für das Protektorat Böhmen und Mähren* (1940), which lists villages not annexed by Nazi Germany in 1938 (i.e., in the Protectorate of Bohemia and Moravia, or interior) by German and Czech name, regional council district (*Oberlandratsbezirk*) and subdistrict (*Bezirk*). As a supplementary source, I use *Sudetendeutsches Ortsnamenverzeichnis* (1987), which lists villages in the annexed majority-German borderlands alphabetically by German name, along with their Czech name and government district (*Regierungsbezirk*). With the aid of GIS maps of the Protectorate by Jelínek (2011) and 15,070 modern sub-municipal villages (*části obce*), provided by the Czech Statistical Office (CZSO) via its collaboration with the Czech Land Survey Office (ARCDATA PRAHA, 2017), I create a precise 'Munich Agreement line' (MAL) to measure the German 'language border' and sort modern villages into treatment or control groups (see Figure 2). I then aggregate this assignment as necessary.

The first Czechoslovak population census was taken in 1921. Decadal censuses have been held ever since except during WWII. A smaller population index was also compiled for the Czech lands in May 1947. The 1930 census contains information for 330 judicial districts (*soudní okresy*) as well as 151 political districts (*politický okresy*), a superset of judicial districts, on ethnic composition, literacy, and employment by sector. The 1947 index and 1950 census contain data on employment but not literacy or education, with the number of political districts for the former increasing to 163, and judicial and political districts being consolidated in 1949 into 182 districts (*okresy*). The latter also provides the first post-WWII data on ethnic composition (see Table 1). From 1961 to 1991, censuses contain information on ethnic composition, educational

Table 1. *Exposure to Expulsion.*

Region (subsample)	% German, 1930	% German, 1950
Borderlands (within 25 km of MAL, no overlap)	81.78	4.439
	(2.276)	(0.597)
Interior (within 25 km of MAL, no overlap)	1.601	0.495
	(0.396)	(0.047)
Borderlands (no bandwidth, no overlap)	86.67	6.821
	(1.646)	(1.184)
Interior (no bandwidth, no overlap)	1.646	0.464
	(0.418)	(0.036)
Borderlands (full sample)	80.874	5.36
	(1.904)	(0.808)
Interior (full sample)	3.545	0.569
	(0.544)	(0.042)

Notes: Units of observation for 1930 are 330 judicial districts. Units of observation for 1950 are 182 districts. Standard errors are reported in parentheses. A district is considered to be in the borderlands (interior) if 50% or more of its area lies inside (outside) the lands annexed by Germany in 1938, as determined by the MAL. The full sample includes districts that overlap the MAL. A district is classified as 'no overlap' if >95% of its area lies on one side of the MAL or the other. A district is classified as 'within 25 km' if its centroid lies within 25 km of the MAL. As Prague and Polish Zaolzie are always excluded from the analysis, I exclude them here as well.

attainment, and employment by sector for 76 more-aggregated districts. For the 2001 and 2011 censuses, the number of districts increases to 77 and data are also provided for 6,258 and 6,251 municipalities (*obce*), respectively.

Most data from the 1930, 2001, and 2011 censuses come from scanned or digital files provided by CZSO. All other district-level census data are made available by the Urban and Regional Laboratory (URRlab, 2017) at Charles University in collaboration with the Czech Ministry of Culture, along with corresponding district shapefiles for each census year. More disaggregated administrative boundary data come from ARCDATA PRAHA (2017).

Non-census pre-expulsion outcome data come from a variety of sources. I construct 1933 variables using data from state social insurance and taxation reports published in 1938.[12] The former provides the number of registered unemployed in each political district, while the latter lists income and the share of eligible taxpayers by political district. These are combined with data on the size of the labour force and population from the 1930 census to estimate 1933 unemployment and income per capita, respectively. Crime data were provided by URRlab (2017). Historical railway data were provided by HGISe (2020), while roads data are digitised from a 1930 map produced by the Autoclub of the Czechoslovak Republic (*Autoklub RČS*), shown in Figure A.5 in the Supplemental Material.

For the post-expulsion period, non-census data are digitised from several statistical reports published from the mid-1940s. District-level data for arable land in 1945 and school enrollment in 1947 are derived from the 1947 and 1948 editions of an annual state statistical report, respectively. Migration data come from demographic yearbooks made available by CZSO. Data on abandoned and destroyed structures and settlements come from Zaniklé obce a objekty (2018). Data on the number of jobless by municipality in 2011 were downloaded from the Czech Ministry of Labour and Social Affairs.

[12] See the Data Appendix in the Supplemental Material for a full breakdown of all data and their sources.

3. The Regional Economic Impact of Expulsion

After WWII, around 95% of Germans living in the Czech lands (i.e., the modern day Czech Republic) were stripped of their citizenship, property rights, and permanently expelled. This section examines how this impacted former-German places in the long-run. Prior to the expulsion, those still identifying as German within the Czech lands were concentrated in one region: the borderlands, or *Sudetenland*. Although German-speaking had long been prominent in the corners of the Czech lands, historical developments associated with the rise of nationalism resulted in this region becoming semi-formal by the 1920s, defined by a spatial discontinuity in German identification, or 'language border', in official statistics (see Figure 1). This boundary was formalised in 1938, when the Munich Agreement enabled Germany's annexation of majority-German areas.

Such dramatic variation in German identification allows me to capture differences in exposure to the expulsion across local administrative units (e.g., municipalities, districts) and thus identify the relative effects of the expulsion on the places from which the displacement occurred. While German identification was grounds for an individual's expulsion throughout the Czech lands, regardless of place,[13] the *proportion* of individuals identified as German and thus expelled in 1945 jumps discontinuously within the Czech lands at the MAL, from 1–2% in interior districts to around 80% in borderland ones, as shown in Table 1. By 1950, differences had largely disappeared, due to the expulsion.

I thus define the treatment variable to be a discrete function of a place's exposure to the expulsion by assigning a value of 1 to any municipality or district that was on the majority-German side of the MAL and a 0 to those in the 'interior', where few Germans lived. To the extent that other, potentially confounding factors (i.e., historical shocks besides the expulsion) vary smoothly through the MAL, this will let me identify how places in which the expulsion occurred were in turn affected, relative to otherwise-similar unaffected places. This strategy is similar to spatial regression discontinuity (RD), in that it exploits a discontinuous change in average treatment intensity across space, and is akin to fuzzy RD, in that variation is discontinuous but not binary.[14] However, unlike standard approaches, treatment assignment for administrative units is also non-binary, given the presence of some Germans in many predominantly Czechs regions and vice versa. This is similar to Eugster *et al.* (2017), who use the Swiss language border to capture non-binary cultural variation. As such, I adopt their language and refer to this approach as a 'language border contrast' (LBC). Like spatial RD, this requires certain identifying assumptions be met, which I discuss in detail in this section. First, I define the standard, municipal-level equation:

$$y_{mdb} = \alpha + \beta InBorderlands_m + f(location_m) + \mathbf{X}'_m\mathbf{\Gamma} + \mathbf{\Sigma}_b + \mathbf{\Delta}_d + \varepsilon_{mdb}, \quad (1)$$

where y_{mbd} is the outcome variable for municipality m in district d along segment b of the MAL, and $InBorderlands_m$ is the treatment dummy denoting whether municipality m lies in the borderlands where most Germans lived.[15] The remaining terms, discussed below, are a running

[13] Initially, the borderlands likely retained a larger proportion Germans out of need. By the 1950s, however, remaining Germans had either been expelled or dispersed throughout the Czech lands, often out of the borderlands (Gerlach, 2017). Following this and large inflows of interior Czechs into the borderlands, Table 1 shows that the share of Germans dropped more in the borderlands from 1930–50, albeit from a larger base.

[14] Later robustness checks sharpen the MAL by dropping mixed areas around it, i.e., areas likely to experience pre-treatment sorting thus violating standard RD assumptions, and produce similar estimates.

[15] 94 municipalities for which only some parts were annexed are dropped. I define treated as > 95% area annexed. All specifications and plots exclude those which otherwise overlap the MAL. For 1930–47 analyses, where units are

variable, $f(location_m)$; a set of geographic characteristics, $\mathbf{X}_m$; a set of border segment fixed effects, $\mathbf{\Sigma}_b$; a set of district fixed effects, $\mathbf{\Delta}_d$; and an error term, ε_{mdb}.

Running variable

The borderlands and interior may exhibit differences in geography, market access, or various historical experiences, confounding estimates. The purpose of the running variable $f(location_m)$ is to account for relevant factors besides the treatment that vary across space, such as these, to the extent that they evolve smoothly at the boundary—an assumption for which I later argue. If successful, β in equation (1) will estimate effects associated only with the treatment, holding such factors fixed. In choosing a running variable, many RD designs begin by limiting the sample to a narrow bandwidth around the border of interest. If this is feasible given the sample, then a linear running polynomial is often a good approximation, with minimal noise in estimates (Gelman and Imbens, 2018). As the region of study is quite small in this setting, all samples are easily limited to 50 km of the MAL, and for most specifications I adopt a bandwidth of 25 km.[16]

Another important choice is the variable itself. In order to estimate effects *at the boundary*, I adopt as my primary running variable a linear polynomial in *distance from the MAL*, interacted with the treatment. This focuses the analysis on treated areas that are in closest proximity to control areas. Further away from the MAL, differences in fundamentals and other factors such as pre-expulsion labour markets grow, as does the cost of migration for interior Czechs, rendering sustained regional differences post-expulsion less surprising. I also include other covariates, as discussed next, to account for spatial heterogeneities that might influence the effects of being x km from the MAL and, in turn, the estimates of interest.

Another common choice for spatial RD is a two dimensional linear polynomial in *longitude and latitude*. Unlike the former approach, this does not account for differences in slope by treatment status for confounding factors. This may produce biased estimates, as tends to be the case with non-interacted running variables (Lee and Lemieux, 2010). Furthermore, unlike with the distance variable, one cannot overcome this by interacting longitude and latitude with the treatment variable, as then treatment effects would not be estimated *at the MAL*. This is because while the distance variable is standardised around the boundary in space, longitude and latitude are not. Nevertheless, I follow Lee and Lemieux (2010) and report effects using longitude and latitude for completeness, as secondary estimates. Alternative bandwidth and polynomial approaches are also included in the Supplemental Material.

Covariates and standard errors

The running variable alone may not sufficiently approximate all smooth factors in the presence of significant spatial heterogeneity. For instance, the gradients of unobservables in distance from the MAL may vary by region, or they may be too complex for parametric running polynomials to approximate. I therefore include several additional covariates to supplement the running variable.

First, main regressions control for a set of exogenous, time-invariant geographic characteristics, including elevation, ruggedness, temperature, precipitation and rivers (km per km^2).[17] Although these appear smooth through the MAL, one concern is that they change too sizably or frequently

larger such that more area is dropped, results are similar when including units that overlap the MAL but were nonetheless homogeneously German (i.e., treated in spite of overlap) or non-German—about half of units dropped—as shown in Tables A.5 and A.30.

[16] Increments of 25 km are standard in the prior literature, as optimal bandwidths vary by outcome.

[17] See Dell (2010) and Eugster *et al.* (2017) for similar border analyses utilising controls.

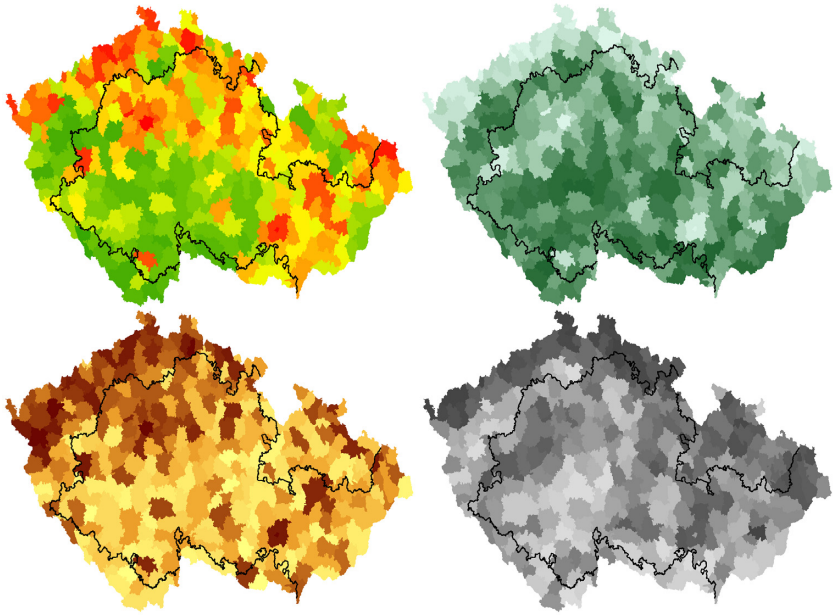


Fig. 3. *Heatmaps for Population Density, % Employment in Agriculture, % Employment in Industry and % Employment in Business in 1930 (Clockwise from Top Left).*
Notes: Darker shades indicate larger values.

in some regions as one moves away from it, in a manner poorly approximated by a linear trend (see page 44 of the Supplemental Material).[18] To the extent that relevant outcomes are correlated with geography, this could generate false discontinuities in estimates that disappear once these controls are included. Indeed, estimated differences for geographic factors themselves go to zero once I condition on the remaining set of geographic characteristics, as shown in Table 2. That being said, results are generally robust to excluding such controls.[19] Results are also robust to using a restricted sample with only geographically cohesive (i.e., flat) parts of the Czech lands included, as in Dell (2010).

All main empirical specifications also control for unobservable characteristics using border segment fixed effects and thus exploit variation within local regions around the MAL. The importance of this is illustrated in Figure 3, which shows significant economic heterogeneity throughout the Czech lands independent of the MAL locally. The number of segments is chosen with this in mind, with 50 relatively disaggregated segments defined for municipal-level regressions, each about 50 km in length. Specifications with more aggregated units lengthen these to 24 segments for judicial districts, each about 100 km in length, and 16 for political districts (in which judicial districts are nested), about 150 km in length. As having more segments lowers variation used, it is reassuring that results are largely unchanged when using just eight long border segments for all regressions.[20] In regressions that utilise municipal-level data, I also include district fixed effects.

[18] Also see Table A.2 in the Supplemental Material for unconditional local means and Table A.6 for regressions of geographic variables with running variables but no other geographic controls.
[19] Some coefficients, such as for population density, grow in the expected direction, given the more rugged nature of the borderlands on average. See Tables A.6, A.13 and A.31 in the Supplemental Material.
[20] See Tables A.8, A.17 and A.32 in the Supplemental Material.

Table 2. *Pre-Expulsion Economic Differences Between Regions.*

	% German (1a)	Literacy rate (1b)	ln Pop. density (1c)	Labour force part. (1d)	Unemployment rate (1e)	Income$_{pc}$ (1f)
In borderlands	67.968	−0.222	−0.318	−0.400	−3.936	−1.866
(linear in distance)	(6.042)***	(0.217)	(0.208)	(1.196)	(2.535)	(1.832)
R^2	0.933	0.533	0.475	0.623	0.69	0.409
In borderlands	73.575	0.264	−0.108	0.631	1.781	−0.392
(linear in x and y)	(3.853)***	(0.152)*	(0.116)	(0.769)	(2.449)	(1.490)
R^2	0.933	0.515	0.482	0.633	0.645	0.387
Mean dep. var.	1.601	98.385	4.764	45.386	9.791	9.428
in interior	(3.760)	(0.669)	(0.733)	(4.622)	(10.028)	(4.661)
Observations	165	165	165	165	104	104
Clusters	98	98	98	98	–	–
Border segments	24	24	24	24	16	16
Bandwidth	25 km	25 km	25 km	25 km	50 km	50 km
Year	1930	1930	1930	1930	1933	1933

	% Taxpayers (2a)	Convicts$_{pc}$, 1923–27 (2b)	% Roma (2c)	% Jewish (2d)	Roads (km) per sq. km (2e)	Rail (km) per sq. km (2f)
In borderlands	0.006	−0.454	−0.002	−0.113	0.014	0.005
(linear in distance)	(0.604)	(0.683)	(0.002)	(0.140)	(0.016)	(0.009)
R^2	0.562	0.361	0.1	0.324	0.311	0.393
In borderlands	0.391	0.230	−0.001	0.064	0.004	0.010
(linear in x and y)	(0.484)	(0.404)	(0.001)	(0.068)	(0.011)	(0.008)
R^2	0.541	0.337	0.112	0.328	0.302	0.406
Mean dep. var.	5.680	7.273	0.001	0.182	0.216	0.096
in interior	(1.981)	(2.058)	(0.006)	(0.477)	(0.074)	(0.065)
Observations	105	164	165	165	271	271
Clusters	–	98	98	98	107	107
Border segments	16	24	24	24	24	24
Bandwidth	50 km	25 km	25 km	25 km	25 km	25 km
Year	1933	1923–27	1930	1930	1930	1930

	Elevation (3a)	Ruggedness (3b)	Precipitation (3c)	Temperature (3d)	Rivers (km) per sq. km (3e)	% Arable land 1945 (3f)
In borderlands	0.509	0.064	0.108	0.001	−0.061	0.279
(linear in distance)	(2.630)	(0.245)	(0.233)	(0.016)	(0.048)	(4.542)
R^2	0.994	0.58	0.978	0.993	0.336	0.707
In borderlands	0.112	0.059	0.452	0.002	−0.007	−1.340
(linear in x and y)	(1.743)	(0.243)	(0.236)*	(0.009)	(0.048)	(3.664)
R^2	0.995	0.585	0.982	0.995	0.333	0.716
Mean dep. var.	398.881	6.093	53.104	7.650	1.141	51.181
in interior	(133.667)	(2.840)	(6.839)	(0.709)	(0.527)	(12.152)
Observations	4,049	4,049	4,049	4,049	4,049	115
Clusters	71	71	71	71	71	–
Border segments	50	50	50	50	50	16
Bandwidth	25 km	25 km	25 km	25 km	25 km	50 km

Notes: All regressions exclude Prague and Polish Zaolzie, include border segment fixed effects as well as exogenous controls for elevation, ruggedness, precipitation, temperature and river density (km per km^2), except when used as an outcome variable, and utilise a local linear running variable of either distance from the MAL interacted with the treatment or longitude and latitude. Units of observation are judicial districts, except unemployment, income and taxpayers, which use political districts, a superset of judicial districts; time-invariant geographic outcomes, which use municipalities; and road and railway densities, which use judicial districts 'parts', derived in ArcGIS according to the 'split sample analysis' described in the Supplemental Material. Average 1933 income per capita is in units of 100 Czechoslovak koruna. Average convicts per capita indicates the number of convicted offenders in Czech criminal districts between 1923 and 1927 as a proportion of the total population in 1930. All shares are out of 100. Robust standard errors are clustered by political district, with ***, ** and * denoting significance at the 1%, 5% and 10% levels, respectively.

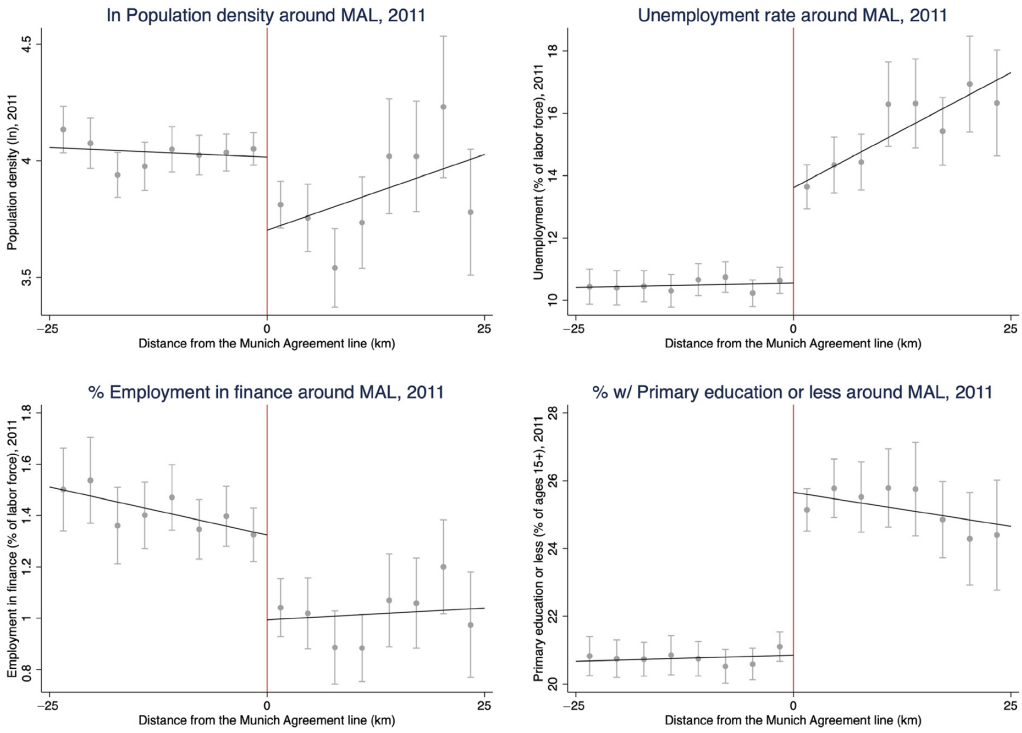


Fig. 4. *Spatial Distribution of Economic Activity Around Munich Agreement line, 2011.*
Notes: Negative distance = interior; positive distance = borderlands.

These are potentially important, as the 77 districts were key governing entities until 2003 with dominion over public goods, such as major roads and secondary education (OECD 2006).

Standard errors are clustered at the district (or political district) level.[21] This is motivated by the role of districts as governing units, such that municipal characteristics are likely to be correlated within districts. Alternative approaches, including Conley (1999) standard errors and border segments as clusters, produce similar results (see Table A.18).

Balance testing

In this subsection, I provide evidence that borderland and interior areas were alike *at the MAL* in relevant ways prior to the expulsion. Though not essential for the expulsion to have had real and identifiable effects, it concentrates the analysis on treated and untreated areas that are highly similar aside from their difference in expulsion experience. This is advantageous for two reasons. First, it suggests that regions were not differentially exposed to historical shocks prior to the expulsion that might instead be driving long-run effects. Second, pre-existing differences have the potential to interact with the treatment in general equilibrium. For example, if Germans and Czechs worked in very different sectors, or if places with many Germans had very different natural factors, then the set of Czechs who could feasibly resettle those areas in the short-run would be more limited, diminishing the prospect of long-run convergence at the boundary.

[21] In regressions with political districts for units, standard errors are heteroskedasticity-robust.

Section 1 detailed how, following centuries of admixture and common rule, Germans and Czechs exhibited few social or economic differences in the early 1900s, with the developments that gave rise to the MAL and eventual expulsion rooted in national rather than economic considerations (Zahra, 2008). To test this, I examine whether the MAL and the ethnolinguistic differences for which it was drawn were associated prior to the expulsion with differences in factors such as education, labour market factors and institutions at the MAL, where other relevant factors such as natural geography are fixed.

I begin by reaffirming that the MAL identifies German identification and thus exposure to the expulsion. Table 2 shows that traversing the MAL was associated with an increase of about 68 percentage points (pp) in the German population in 1930. In contrast, it coincides with statistically significant differences for no other factor in primary specifications.

First, Czech and German speakers in the Czech lands appear to be 'well-matched' in terms of *education*, consistent with the historical evidence laid out in Section 1, with literacy rates in 1930 of around 98% on both sides of the MAL (Zahra, 2008, p. 18). Despite some regional differences in educational content, this reflects the high educational standards of the Czechoslovak system with respect to all individuals.

Pre-expulsion *labour markets* also exhibit smoothness through the MAL, a fact that speaks favourably to the potential resettlement of the borderlands by nearby interior Czechs. Consistent with the historical literature, sectors do not appear to vary significantly at the MAL in Table 3, including for German-dominated industries overall such as glassworks and textile manufacturing. Unemployment, which affected German-speaking areas closer to Germany more severely during the Depression, is likewise smooth through the MAL, where the industrial composition of Czech and German speakers was more similar, as are other labour market outcomes such as income. One exception is the machine and auto industry, which exhibits a decrease in the secondary specification, although no other running variable assumptions generate such significance.[22] These alternative specifications as well as plots of all outcome variables are available in the Supplemental Material.

Lastly, though more difficult to test, the results here are consistent with the historical literature in downplaying local differences in *institutions*. The relative egalitarianism of the Czech lands across ethnic groups is apparent in the regions' similar taxation and criminal conviction levels, as shown above. Another indicator of such egalitarianism comes from examining market access, as measured by transport availability. As it is plausible that major road and rail connections might have been fewer in the borderlands, I examine balance tests for both major roads and railways per square km. A lack of smoothness would likely have had implications for long-run effects, as transport integration would have been key to minimising differences between the regions after the expulsion. Table 2 shows both to be highly smooth through the MAL as of 1930. Estimates are similar for rails using data from 1940, but, as that data are less reliable, I do not feature them here.[23] Figure A.4 in the Supplemental Material maps these connections for both years, while Figure A.5 shows major roads in 1930. Overall, these results corroborate the notion that Germans and Czechs in the Czech lands were highly similar after centuries of coexistence, as argued by historians—as well as by the Nazis during WWII (Bryant, 2007).

[22] Some estimates, namely for population density, are likely to be correlated with geography and indeed gain in significance when these controls are dropped, showcasing their importance. For these estimates, see Table A.6 in the Supplemental Material.

[23] This is according to the creators of the data set. For completeness, I do include the 1940 estimates in Table A.35 in the Supplemental Material; they are similar.

Table 3. *Pre-Expulsion Sectoral Differences Between Regions.*

	Agricultural sector (1a)	Mining and extraction (1b)	Metals (1c)	Machinery and auto (1d)	Glass (1e)	Textiles (1f)
In borderlands	2.915	−1.150	0.455	−0.421	1.065	−3.311
(linear in distance)	(3.649)	(1.698)	(1.458)	(0.561)	(1.681)	(2.534)
R^2	0.526	0.376	0.313	0.298	0.338	0.634
In borderlands	−1.264	−0.982	−0.414	−0.697	0.230	0.758
(linear in x and y)	(2.577)	(0.970)	(0.911)	(0.324)**	(0.479)	(1.552)
R^2	0.535	0.395	0.339	0.311	0.35	0.64
Mean dep. var.	30.713	3.510	4.818	2.631	0.674	5.586
in interior	(12.800)	(4.568)	(3.793)	(2.187)	(1.891)	(9.646)
	Other industry (2a)	Con-struction (2b)	Transport sector (2c)	Finance and insurance (2d)	Trade (2e)	Other service (2f)
In borderlands	0.102	0.500	−0.457	−0.110	−0.534	−0.355
(linear in distance)	(1.429)	(0.719)	(0.665)	(0.094)	(0.796)	(0.927)
R^2	0.315	0.332	0.318	0.258	0.377	0.209
In borderlands	−0.702	0.339	−0.114	−0.015	0.498	0.722
(linear in x and y)	(1.062)	(0.568)	(0.420)	(0.056)	(0.416)	(0.643)
R^2	0.275	0.336	0.321	0.245	0.356	0.175
Mean dep. var.	14.985	6.744	3.560	0.428	5.151	6.394
in interior	(5.403)	(1.862)	(2.153)	(0.350)	(1.722)	(3.662)
Observations	165	165	165	165	165	165
Clusters	98	98	98	98	98	98
Border segments	24	24	24	24	24	24
Bandwidth	25 km	25 km	25 km	25 km	25 km	25 km
Year	1930	1930	1930	1930	1930	1930

Notes: All regressions exclude Prague and Polish Zaolzie, include border segment fixed effects as well as exogenous controls for elevation, ruggedness, precipitation, temperature and river density (km per km^2) and utilise a local linear running variable of either distance from the MAL interacted with the treatment or longitude and latitude. Units of observation are judicial districts. All outcomes represent the share (out of 100) of the labour force in a sector. Robust standard errors are clustered by political district, with ***, ** and * denoting significance at the 1%, 5% and 10% levels, respectively.

Other concerns: WWII, pre-treatment sorting and borderland Czechs

The same nationalism that motivated the expulsion also inspired the annexation of the borderlands and occupation of Czechoslovakia by Nazi Germany a few years prior. Yet one concern is that such events and others during WWII might have differentially affected borderland areas near the MAL. Indeed, a major limitation in studying this era is the lack of data from during the war. I address these concerns here.

Following annexation and occupation, the Czech government was exiled and preferential treatment of the Czech regions by the Nazis during the war would have favoured the borderlands, biasing estimates toward zero. That being said, both the borderlands and interior experienced little physical destruction during the war, with Czech civilian casualties from such of about 10,000 (Erlikhman, 2004).[24] There were also few acts of resistance by Czechs. Czechs made up a large and important industrial workforce, and Nazi officials saw much of the Czech masses as 'Germanisable' due to their cultural and genetic proximity. Thus, life in the Czech interior continued largely as normal, avoiding much of the violence experienced by Yugoslavia and

[24] Sudeten German civilian casualty counts are uncertain, but few bombs struck the borderlands. See Figure A.3 for a map of confirmed Allied WWII bombings. See Table A.3 for more on casualty estimates.

Poland (Agnew, 2004; Bryant, 2007; Glassheim, 2016). Economic life in the borderlands also changed little, at the displeasure of some borderland Germans, who had sought greater integration into the German economy and society. In all, 'Czechoslovakia emerged from the war with much of its industrial base intact' (Gerlach, 2017, p. 208).

Differences in military deaths are more difficult to discern. Historical accounts suggest the borderlands suffered more in terms of war casualties than the interior, due to conscription of Sudeten Germans. A more recent estimate by Overmans (2004) places the number of German war dead from all annexed territories, including annexed Poland, at 206,000. However, counts are complicated by the fact that many deaths occurred during the violent liberation of Czechoslovakia in May 1945, which also marked the first expulsions. Separately, many Jews and Roma were expelled from or murdered in the Czech lands during this time. However, these groups were distributed uniformly through the MAL, as shown in Table 2.[25] Thus, pre-1945 casualty rate differences between the regions were likely small on net.

Another concern is related to the non-binary nature of treatment assignment. Unlike the interior, which by 1930 was strikingly homogeneous (at least officially), some parts of the borderlands were quite mixed, especially near the MAL. Some of this was rooted in *pre-treatment sorting* by Czechs. According to historians, such migrations occurred several times—first by interior Czechs immigrating to some borderland cities after 1918, then by 300,000 of the 730,000 borderland Czechs into the interior during the war, and finally by nearly all of those Czechs back into the borderlands after the war (Cornwall, 1994; Agnew, 2004; Glassheim, 2016). This could bias effects if it was driven by relevant factors.

Pre-treatment sorting and the presence of borderland Czechs more broadly, may also make balance tests less useful for evaluating the historical similarity of more and less treated areas, as it would mean that cross-region differences are not necessarily informative of cross-ethnic differences. For example, if Czechs near the MAL were in fact less skilled than Germans, borderland Czechs could bias literacy estimates from positive to zero.

How can one determine the importance of pre-treatment sorting and borderland Czechs in driving pre-expulsion similarities as well as effects? Since I cannot compare Czechs and Germans directly, I rely on heterogeneity in the ethnic composition of the borderlands prior to the expulsion to better compare Czechs and Germans at the MAL. In particular, I reexamine the balance tests above using a sample of 'discrete' stretches of the MAL, in which I compare only homogeneous parts of the interior with nearby, homogeneous parts of the borderlands with few borderland Czechs (and thus little pre-treatment sorting).

In Table A.7 in the Supplemental Material, I show that while this increases the size of the ethnic discontinuity to 86 pp, estimates regarding relative literacy, population density and sector composition change little. One exception, eligible taxpayers, now shows a statistically significant increase from crossing MAL in both specifications tested, of 1.6 eligible taxpayers per 100 persons. Yet Czechs and Germans overall still appear quite similar as compared across homogeneous districts. Moreover, long-run effects do not appear to be biased by pre-treatment sorting or the presence of borderland Czechs, with full and discrete samples yielding similar results.[26] This

[25] Estimates are similar if I instead use a measure of Jewish *religious* identification; see Figure A.6 in the Supplemental Material for this data plotted.

[26] See Table A.16 in the Supplemental Material. I also estimate pre-trends at the MAL using both full and discrete samples, as shown in Table A.11. Development trajectories of Germans and Czechs between 1921–30 are overall similar, although I do estimate relative increases in literacy among Germans.

Table 4. *Long-Run Differences in Economic Activity, 2011.*

	ln Population density (1a)	ln Labour force density (1b)	Unemployment rate (1c)
In borderlands	−0.312	−0.317	2.729
(linear in distance)	(0.095)***	(0.097)***	(0.546)***
R^2	0.398	0.399	0.404
In borderlands	−0.251	−0.253	3.623
(linear in x and y)	(0.084)***	(0.086)***	(0.520)***
R^2	0.4	0.4	0.398
Mean dep. var.	4.034	3.294	10.492
in interior	(0.885)	(0.911)	(4.809)
Observations	4,049	4,049	4,049
Clusters	71	71	71
Border segments	50	50	50
Bandwidth	25 km	25 km	25 km
Year	2011	2011	2011

Notes: All regressions exclude Prague and Polish Zaolzie, include border segment and district fixed effects as well as exogenous controls for elevation, ruggedness, precipitation, temperature and river density (km per km^2) and utilise a local linear running variable of either distance from the MAL interacted with the treatment or longitude and latitude. Units of observation are municipalities. Robust standard errors are clustered by district, with ***, ** and * denoting significance at the 1%, 5% and 10% levels, respectively.

reaffirms the notion that Czechs, Germans and their respective places were similar in relevant ways prior to the expulsion, at least at the MAL.[27]

3.1. *Long-Run Effects*

I will now provide evidence that the expulsion of the Germans had long-lasting effects on the 'borderland' areas from which the displacement occurred and, in turn, the spatial distribution of economic activity within the Czech lands. I will focus on two types of outcomes: (*i*) the intensity of economic activity, as measured by population and employment, and (*ii*) the composition of economic activity, as measured by education and occupation.

Prior to the expulsion, borderland populations were as skilled and prosperous as their interior neighbours. If the determinants of economic activity are invariant to the expulsion, then one would expect to see interior Czechs spilling over into relatively similar, nearby borderland areas in smooth ways thereafter. Instead, borderland municipalities today show signs of marked economic decline relative to interior towns a few miles away. As of 2011, economic activity remains more concentrated in the interior, as shown in Table 4, with population density being 36.6% lower on average in borderland municipalities relative to nearby interior ones.[28] Borderland towns also have some of the highest unemployment rates in the Czech Republic. Column (1c) shows that simply crossing the MAL is associated with a 2.7 pp increase in the municipal unemployment rate, a 26% increase from nearby interior areas. This illustrates how production remains less likely to locate in the borderlands, nearly seven decades after the expulsion and two since transition.

Table 5 suggests that this stems from compositional differences between the regions. In contrast to Table 3, the borderlands today exhibits significantly lower employment in several skill-intensive

[27] And in addition to the kinds of pre-treatment sorting discussed above, this exercise reaffirms that the kind in which Germans 'switched' to Czech also would likely not have mattered much.

[28] This is based on $e^{0.312} - 1 = 0.366$.

Table 5. *Long-Run Differences in Sectoral Composition, 2011.*

	Agricultural sector (1a)	Industry (1b)	Con-struction (1c)	Transport sector (1d)	Finance and insurance (1e)	Hospitality (1f)
In borderlands	−0.573	−0.621	−0.447	−0.117	−0.369	0.365
(linear in distance)	(0.433)	(0.860)	(0.267)*	(0.248)	(0.080)***	(0.280)
R^2	0.303	0.34	0.155	0.19	0.134	0.339
In borderlands	−0.752	−1.132	−0.136	−0.034	−0.386	0.440
(linear in x and y)	(0.457)	(0.717)	(0.223)	(0.244)	(0.073)***	(0.234)*
R^2	0.304	0.340	0.154	0.191	0.134	0.344
Mean dep. var.	7.653	26.672	7.212	5.309	1.408	2.119
in interior	(6.576)	(7.489)	(3.197)	(2.664)	(1.273)	(1.587)

	Auto trade and repair (2a)	Public (2b)	Commun-ications (2c)	Education (2d)	Health care (2e)	Other service (2f)
In borderlands	−0.864	0.001	−0.297	−0.864	−0.993	−0.219
(linear in distance)	(0.282)***	(0.274)	(0.089)***	(0.176)***	(0.230)***	(0.166)
R^2	0.201	0.125	0.204	0.085	0.139	0.214
In borderlands	−0.933	−0.310	−0.381	−0.791	−0.780	−0.411
(linear in x and y)	(0.252)***	(0.232)	(0.082)***	(0.145)***	(0.233)***	(0.134)***
R^2	0.201	0.123	0.202	0.085	0.139	0.211
Mean dep. var.	7.959	4.476	1.294	4.203	4.676	4.515
in interior	(3.311)	(2.371)	(1.272)	(2.297)	(2.797)	(2.650)
Observations	4,049	4,049	4,049	4,049	4,049	4,049
Clusters	71	71	71	71	71	71
Border segments	50	50	50	50	50	50
Bandwidth	25 km	25 km	25 km	25 km	25 km	25 km
Year	2011	2011	2011	2011	2011	2011

Notes: All regressions exclude Prague and Polish Zaolzie, include border segment and district fixed effects as well as exogenous controls for elevation, ruggedness, precipitation, temperature and river density (km per km^2) and utilise a local linear running variable of either distance from the MAL interacted with the treatment or longitude and latitude. Units of observation are municipalities. All outcomes represent the share (out of 100) of the labour force in a sector. Robust standard errors are clustered by district, with ***, ** and * denoting significance at the 1%, 5% and 10% levels, respectively.

sectors, relative to nearby interior areas. For example, the share of the labour force working in finance declines by about 26% on average upon crossing the MAL into the borderlands, while employment in health care on average sees decreases of about 21%. In contrast, employment shares in agriculture and other less technical trades remain relatively similar on both sides of the MAL nearly seven decades after the expulsion.

These differences suggest a lower concentration of human capital in the borderlands relative to nearby interior areas. The next set of estimates in this section, in Table 6, suggest this to be the case. The results are striking: I observe a 4.9 pp increase—about a standard deviation—in the adult (i.e., aged 15 or over) population with no more than a primary education associated with crossing the MAL into the borderlands. This is met by a 3.9 pp decrease in secondary schooling and a 1.9 pp decrease in tertiary education, such as college—the latter being about a 22.2% decrease from the control mean.[29]

[29] Employment and education coefficients do not add up to zero due to non-reporting also being higher in the borderlands. For instance, the residual category for employment as a share of the labour force produces a coefficient of 2.27 (0.36). For education, it is 0.98 (0.19).

Table 6. *Long-Run Differences in Educational Attainment, 2011.*

	% Primary education or less (1a)	% Secondary education (1b)	% Tertiary education (1c)
In borderlands	4.883	−3.923	−1.936
(linear in distance)	(0.634)***	(0.516)***	(0.391)***
R^2	0.297	0.199	0.271
In borderlands	4.965	−3.759	−2.270
(linear in x and y)	(0.543)***	(0.453)***	(0.375)***
R^2	0.298	0.201	0.269
Mean dep. var.	20.767	66.939	8.716
in interior	(4.980)	(4.827)	(3.926)
Observations	4,049	4,049	4,049
Clusters	71	71	71
Border segments	50	50	50
Bandwidth	25 km	25 km	25 km
Year	2011	2011	2011

Notes: All regressions exclude Prague and Polish Zaolzie, include border segment and district fixed effects as well as exogenous controls for elevation, ruggedness, precipitation, temperature and river density (km per km^2) and utilise a local linear running variable of either distance from the MAL interacted with the treatment or longitude and latitude. Units of observation are municipalities. All outcomes represent the share (out of 100) of the adult (age 15+) population with up to that level of education. Robust standard errors are clustered by district, with ***, ** and * denoting significance at the 1%, 5% and 10% levels, respectively.

Results do not meaningfully change if one considers only geographically cohesive or previously homogeneous parts of the Czech lands, reaffirming that geography and the non-binary treatment assignment are not driving effects. Results are also robust to using longer or no border segments, dropping district fixed effects, dropping controls, modifying bandwidth and running variable assumptions, clustering by border segment, and using Conley standard errors with various bandwidths (see Tables A.12–18 in the Supplemental Material). See Figure 4 for examples of these long-run results.

4. Channels

The previous section documented relatively depressed levels of economic activity in the Czech borderlands, nearly 70 years after its German population was expelled. This section investigates the channels through which regional disparities originated. Since no unevenness was present prior to the expulsion, I begin by examining the economic activity of those who voluntarily *resettled* the borderlands from interior areas immediately following the expulsion, relative to those who did not. Indeed, the expulsion's impact on the borderlands' relative development depended on it being resettled in a quick and convergent manner. To compare these populations, I use data from after the expulsion and the borderlands' initial resettlement had concluded in mid-1947.[30] This will also allow me to establish whether or not key structural changes had occurred prior to the advent of central planning in 1948. I then use longer-run data to study the subsequent persistence of effects.

In this section, I show that the expulsion was instead followed by a (*i*) *selective initial resettlement*. Settlers disproportionately migrated from interior areas nearby and were rural in origin

[30] The historical literature indicates that the 5% or so remaining were largely skilled workers initially kept out of need, potentially downward biasing 1947 estimates slightly.

relative to their more urban destinations, with fewer workers arriving from skilled sectors such as business relative to agriculture. I argue that this is consistent with agglomeration economies keeping relatively urban workers concentrated in the interior after the expulsion. Simultaneously, I document a large-scale (*ii*) *loss of physical capital* in former-German areas following the expulsion. I argue that this stemmed not from WWII or the Soviet liberation of the Czech lands thereafter, but from an extractive environment engendered by the vacuum of property rights that followed the expulsion. Together, these factors culminated in (*iii*) *urban decay*, with many settlements permanently abandoned, lowered population density and a shift in sectoral composition toward agriculture in former-German areas, as well as (*iv*) *human capital inequalities* between the regions thereafter. While this analysis will focus on the events of the immediate post-expulsion period, during which the Czechoslovak economy remained generally unplanned, I will also discuss how these patterns evolved during the communist period and following transition to a market economy in 1989.

4.1. *Selective Resettlement*

The effects of the expulsion—on former-German areas but also in general equilibrium—depended on the German population first being replaced by interior settlers, in both count and composition. The stated goal of resettlement was that it be geographically *convergent*: since the expulsion 'would reduce the Czechoslovakia population by 25%, the borderlands would only be resettled up to 75% of [its] original population', preserving pre-war *relative* densities while creating one homogeneous nation (Radvanovský 2001, p. 203). This was to be done quickly and concurrently with the expulsion, with the goal of maintaining the region's output (Glassheim, 2016). It was also to be carried out on a voluntary basis. Policymakers used German property, confiscated without payment and reallocated at low rates, in addition to various incentives, as discussed in Section 1. Besides such interventions, worker and firm-level decisions remained unplanned until the communist coup of 1948 (Bernàšek, 1970).

Under such circumstances, one possible migratory response to the expulsion would be a convergent one, at least at the MAL, with interior Czechs migrating to replace Germans with relatively similar labour endowments. Indeed, one might expect the expulsion to have made the borderlands an attractive place in which to settle and invest, given its proximity, factor similarities and the large amounts of former-German land and property available there.

As it turns out, the expulsion *was* met with a large-scale migratory response, beginning in mid-1945 through the first half of 1947. However, this initial resettlement was *selective* in nature, in both (*i*) location, and (*ii*) occupation. To see this, one can compare population losses endured by the interior (i.e., to the voluntary resettling of the borderlands) with those of borderland areas (i.e., from the expulsion net of resettlement) along these dimensions.

4.1.1. *Locational selection among settlers*

Understanding where Czech migrants settled within the borderlands after the expulsion, as well as from where they originated in the interior, is of primary importance for understanding how the expulsion affected not just former-German areas, but the economic geography of the Czech lands overall. To do this, I construct an outcome variable to measure population losses in each

Table 7. *Regional Population Loss Patterns, 1930 to mid-1947.*

	$PopChange_d$			
	(1a)	(1b)	(2a)	(2b)
In borderlands	−13.538	−15.621	−16.407	−18.670
(linear in distance)	(2.991)***	(3.164)***	(2.104)***	(2.106)***
In borderlands×Dist. to MAL	0.066	0.146	−0.201	−0.172
	(0.229)	(0.256)	(0.089)**	(0.090)*
In borderlands×Near urban$_{\cdot 30}$	–	12.839	–	16.721
		(6.630)*		(4.591)***
Distance to MAL	−0.430	−0.418	−0.179	−0.158
	(0.128)***	(0.150)***	(0.067)***	(0.069)**
Near urban$_{\cdot 30}$	–	4.743	–	−1.752
		(4.566)		(3.072)
R^2	0.830	0.846	0.799	0.809
In borderlands	−21.055	−22.573	−22.009	−23.627
(linear in x and y)	(1.760)***	(1.822)***	(2.064)***	(2.076)***
In borderlands×Near urban$_{\cdot 30}$	–	8.061	–	9.236
		(3.555)**		(3.518)***
Near urban$_{\cdot 30}$	–	3.961	–	3.750
		(2.242)*		(2.260)*
R^2	0.816	0.831	0.786	0.796
Mean dep. var. in interior	−12.564 (7.333)		−10.818 (11.753)	
Observations	165	165	258	258
Clusters	98	98	134	134
Border segments	24	24	24	24
Bandwidth	25 km	25 km	50 km	50 km

Notes: All regressions exclude Prague and Polish Zaolzie, include border segment fixed effects as well as exogenous controls for elevation, ruggedness, precipitation, temperature and river density (km per km^2) and utilise a local linear running variable of either distance from the MAL interacted with the treatment or longitude and latitude. Regressions with the first running variable always feature three-way interactions whenever the 'near urban' dummy present. 'Distance to MAL' interacted with the treatment denotes moving into the borderlands away from the MAL, while non-interacted it denotes moving within the interior *toward* the MAL. To be 'near urban' is to be within 25 km of a city that had 50,000 residents or more in 1930. A coefficient of −10 for 'in borderlands' implies that, from the combined expulsion and resettlement, the average borderland district's population declined 10 pp more (on net) than the average nearby interior district's population. Units of observation are judicial districts. Robust standard errors are clustered by political district, with ***, ** and * denoting significance at the 1%, 5% and 10% levels, respectively.

judicial district d between the 1930 census and mid-1947 index:

$$PopChange_d = \frac{Pop_{d,1947} - Pop_{d,1930}}{Pop_{d,1930}}.$$

To the extent that nearby borderland and interior districts had similar characteristics and trends prior to the expulsion, including few shocks of permanence or scale during WWII, the convergent migratory response envisioned by policymakers would have required that such losses be similar for each region by the time expulsion and the borderlands' initial resettlement had wound down in mid-1947, relative to pre-expulsion levels.

In addition to the treatment dummy indicating a district's region, I exploit two further measures of location to predict population dynamics: (*i*) distance from the MAL, and (*ii*) being within 25 km of a city with 50,000+ residents in 1930, both of which I interact with the treatment, and where applicable each other, to allow for heterogeneous effects.

The baseline results in Table 7 show a lack of convergence at the MAL in mid-1947, contrary to policymaker expectations: while both regions lost in population on net, borderland districts

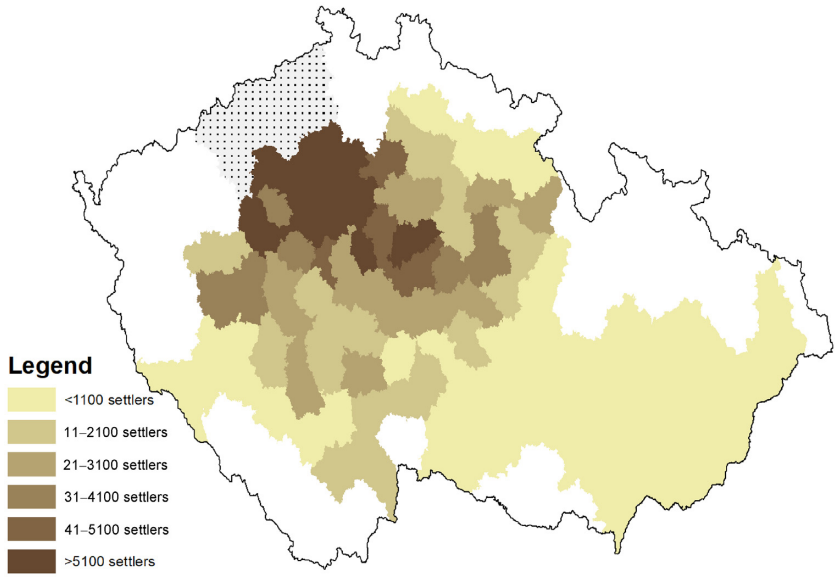


Fig. 5. *Sources of Immigration to Northern Bohemia (dotted region), 1945–7.*
Notes: Migrant Data Sourced from figure in 'Osídlení pohraničí v letech 1945–1952' (1953), reprinted in von Arburg (2001).

had still lost about 13.5 pp more on average post-resettlement than nearby interior districts.[31] As one moves away from the MAL, interior losses shrink, suggesting resettlement to be driven by interior settlers coming from near the MAL. This is consistent with the historical evidence. For instance, Figure 5 illustrates the largely nearby interior sources of settlers to the Northern Bohemian borderlands, as detailed in a 1953 official state report. I also consider specifications with a 50 km bandwidth to evaluate trends beyond the 25 km bandwidth. These, in columns (2), show population losses to also be growing more in the borderlands further from the MAL. Altogether, this suggests that *location-specific human capital* may have been important in driving resettlement, with Czechs migrating from interior areas with similar factor endowments.

Convergence was also more likely conditional on borderland districts being more urban historically. In particular, the interaction effect for being near a major 1930 urban area is positive and significant, while the corresponding baseline term tends to be smaller and insignificant. This also suggests that migration from the interior to the borderlands after the expulsion was not driven by urban interior residents moving to urban borderland areas, but rather by a larger proportion of *rural* interior workers moving to urban borderland areas—and bringing relatively rural labour endowments with them.[32]

Overall, these patterns are consistent with the historical literature, with settlers selecting into larger towns and those closest to the interior, at the expense of rural borderland areas and those closer to international borders (Daněk, 1995; Radvanovský 2001; Gerlach, 2017).

[31] While it is possible that more settlers coming from abroad or Slovakia were of those sectors, these made up a tiny fraction of settlers and would only have made the borderlands' relative declines appear smaller.
[32] I use a 25,000 population threshold in Table A.19. Results are similar, though urban effects are weaker.

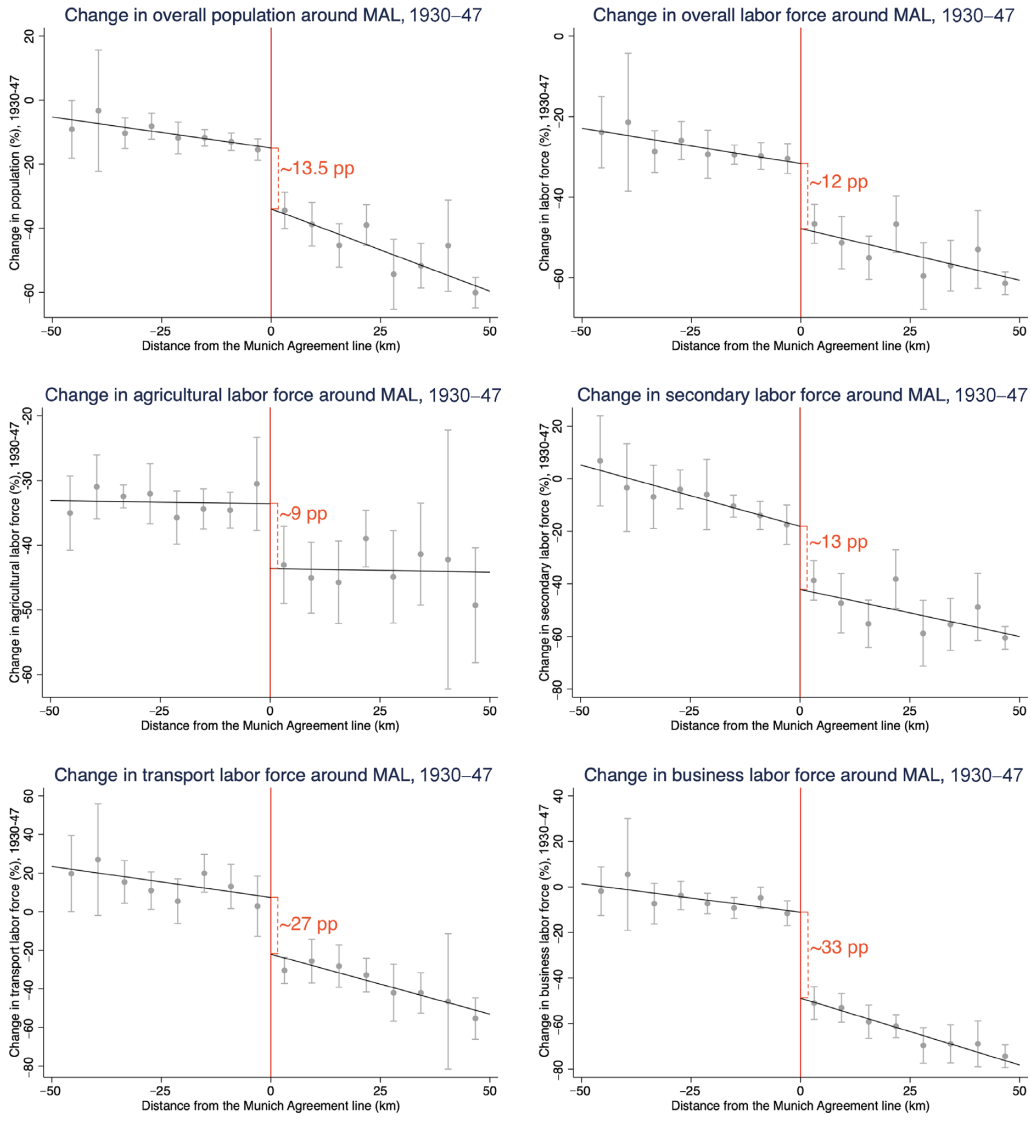


Fig. 6. *Population Change Around Munich Agreement Line by Sector, 1930–47.*
Notes: Negative distance = interior; positive distance = borderlands.

4.1.2. *Occupational selection among settlers*

Given the above findings, it is unsurprising that migratory sorting also occurred on sectoral lines. This can be seen in Figure 6, which charts $PopChange_d$ overall and by sector, both at and away from the MAL. These show differences in worker losses around the MAL were relatively small for agriculture and large for other, more 'urban' sectors such as business. This is consistent with the historical narrative that settlers were disproportionately unskilled farmers, with settlement initiatives struggling to attract skilled workers while interior areas suffered shortages in agricultural labour (Radvanovský, 2001; Gerlach, 2017). Differences in net losses

between regions again shrink as one approaches the MAL. LBC estimates can be found in Table A.20 in the Supplemental Material.[33]

The sources of the patterns in this section are undoubtedly multifarious. In the presence of agglomeration economies, for instance, such a large population shock would have generated a massive spatial coordination problem for the remaining population, potentially *decreasing* the expected relative return to migrating to borderland towns for workers in urban sectors in the short-run—albeit less so where locational fundamentals were similar and where settlements were more populous historically (Allen and Donaldson, 2018). Moreover, with a convergent initial resettlement inhibited, such 'core-periphery' regional patterns could become locked in (Krugman, 1991; Puga, 1999). Indeed, data from the 1930s suggest the presence of strong agglomeration economies throughout the pre-expulsion Czech lands, with population density strongly positively correlated with income and employment in industry, transport and business, and negatively with employment in agriculture, consistent with the selection above.[34] That being said, this need not be the entire story, as I will argue now.

4.2. *Physical Capital Extraction*

Unlike voluntary outmigration events, forced migrations—including both expulsions and those from natural disaster—often entail large amounts of property and capital left behind. This was the case here, as German expellees were allowed to bring little with them. Although confiscation of property was intended to help spur a convergent migratory response, it likely *complicated* early resettlement efforts, helping to generate the patterns observed above.

Although such property was intended to be sold and transferred to incoming settlers, in the interim this vacuum of property rights was exploited by local authorities, as well as appropriative Czechs called 'gold-diggers' (*zlatokopové*), who saw the borderlands not as a place to settle but as a free lunch in its mobile assets. Historians have written extensively on how this helped crowd out the reemergence of production in the borderlands and left it with a 'Wild West'-like character. As a result, the borderlands often failed to attract or retain productive workers, which in turn fed into the concentration of economic activity in interior areas (Radvanovský, 2001; Glassheim, 2016; Gerlach, 2017).

Such extraction did not end there. The expulsion also enabled state officials to expand their political and economic powers. Prior to the 1948 coup, the communists oversaw the structure of the property allocation process, which lent them popularity among some settlers. The party won a plurality of seats for the first time in the 1946 elections, due to its new base of support in the borderlands, where it won three fourths of the vote (Radvanovský, 2001). Hence, the expulsion served as a source of patronage and legitimacy for them. In fact, historians consider the expulsion to have been key, if not necessary, for the communist takeover (Glassheim, 2001; Tampke, 2003). From there, historians have documented how the communist regime extracted from the borderlands. The liquidation and relocation of mills, machinery and other physical capital from under-settled borderland areas further aided in the decline of many towns (Rad-

[33] Other compositional factors, such as sex, were not selected upon, although historians have noted that settlers tended to be younger (Gerlach, 2017). I find no evidence in the 1947 data of selection on sex, though I do estimate a 7.8 (1.1) pp increase from crossing the MAL in the share of the population that is under the age of 15 in mid-1947, something not present in the 1930 data.

[34] Table A.21 shows these correlations, with magnitudes independent of region. Figure A.11 also shows a significant degree of localisation along sector lines in 1930, with industry featuring prominently in Northern Moravia and business in Northern Bohemia, which would have been severely disrupted by the expulsion.

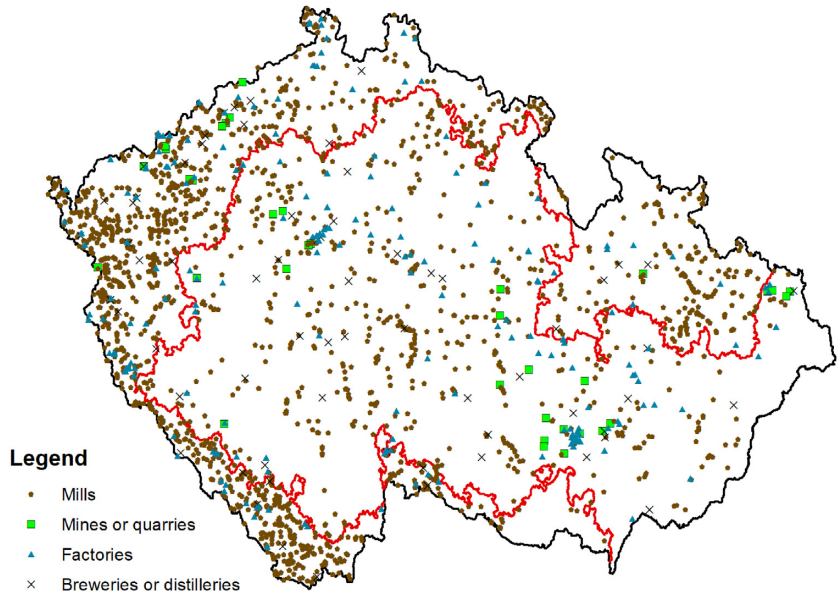


Fig. 7. *Abandoned or Destroyed Industrial Structures (Zaniklé obce a objekty, 2018).*

vanovský, 2001; Gerlach, 2017). Others were uprooted to extract raw materials beneath them (Glassheim, 2016). Soon 'empty factory buildings [dotted] the borderlands like gravestones' (Gerlach, 2017, p. 258).

Figure 7 illustrates this effect, using spatial data from the ongoing Zaniklé obce a objekty (2018) project. The aim of this project is to document abandoned and destroyed sites in the Czech lands, with observations stemming not just from the expulsion but from throughout history. Yet given that records of capital loss were not kept during the expulsion, this data set provides a unique opportunity to visualise how the expulsion impacted borderland capital. In particular, one can use the LBC approach to examine whether there is more observed loss of relevant physical capital associated with former-German areas. To do this, I use the data set to derive a measure of capital loss, an indicator for whether a municipality contains abandoned or destroyed mills, mines, quarries, factories, breweries, or distilleries. I also consider the loss of other urban structures (rail stations, hotels and inns, cottages, churches, synagogues, castles and courtyards). Table 8 shows that the probability that capital loss is observed more than doubles at the MAL, holding municipal size and geographic factors such as ruggedness fixed, with somewhat smaller increases observed for other urban loss.[35]

As the data are generated by a large number of users, giving rise to potential measurement error and especially observational selection for areas with higher probabilities of abandonment (i.e., the borderlands), these coefficients should be taken with caution. However, the presence of significant capital loss in the borderlands is corroborated by a large and well-established historical literature (Radvanovský, 2001; Glassheim, 2001; 2016; Gerlach, 2017). Nevertheless, other potential issues threaten the interpretation of such capital loss as a causal channel. In particular, one important concern is that, rather than resulting from the expulsion, some of the

[35] See Table A.22 in the Supplemental Material for probit estimates, which are similar.

Table 8. *Observed Capital Loss.*

	Capital loss		Other urban loss	
	(1a)	(1b)	(2a)	(2b)
In borderlands (linear in distance)	0.125 (0.029)***	–	0.043 (0.022)*	–
In borderlands (linear in x and y)	–	0.130 (0.028)***	–	0.077 (0.018)***
R^2	0.253	0.256	0.272	0.269
Mean dep. var. in interior	0.088 (0.284)		0.068 (0.252)	
Observations	4,049	4,049	4,049	4,049
Clusters	71	71	71	71
Border segments	50	50	50	50
Bandwidth	25 km	25 km	25 km	25 km

Notes: All regressions exclude Prague and Polish Zaolzie, include border segment and district fixed effects as well as exogenous controls for elevation, ruggedness, precipitation, temperature and river density (km per km^2) and utilise a local linear running variable of either distance from the MAL interacted with the treatment or longitude and latitude. I also control for municipal size (km^2). Units of observation are municipalities. Capital loss indicates whether a municipality has any observed abandoned or destroyed mills, mines, quarries, factories, breweries, or distilleries. Other urban loss indicates whether a municipality has any observed abandoned or destroyed rail stations, hotels and inns, cottages, churches, synagogues, castles, or courtyards. Robust standard errors are clustered by district, with ***, ** and * denoting significance at the 1%, 5% and 10% levels, respectively.

relative capital loss in Table 8 may actually have preceded it and thus influenced the borderlands' subsequent development independent of it.

For instance, Germany's annexation of the borderlands during WWII would have left it vulnerable to bombings by the Allied Powers. To address this, Figure A.3 in the Supplemental Material confirms bombings to be few and concentrated around major urban areas regardless of region. At the same time, the end of WWII saw Czechoslovakia's liberation by Soviet and US forces. Historical evidence suggests that some areas experienced a loss of capital at that time. In particular, violent and appropriative behaviour was reported to have taken place by Soviet Red Army soldiers (Gerlach, 2017). This might have hurt the borderlands' development independent of the expulsion (Feigenbaum *et al.*, 2019).

Unfortunately, no data exist regarding capital flight during Soviet liberation. One can, however, test for differences in capital loss and subsequent convergence by dividing the Czech lands into Red Army and US liberation zones (see Figures A.15–6) and testing for heterogeneous effects. Doing this, I do find some evidence that US zones have better long-run economic outcomes relative to Soviet ones, as in Ochsner (2017). However, I find no evidence that being in a Soviet zone exacerbates borderland effects, suggesting that any initial plundering of borderland capital that took place by Red Army forces is not driving the main expulsion effect. For these results, see Table A.23 in the Supplemental Material.

Altogether, this sheds some light on why effects persist here yet may not after other population shocks (Davis and Weinstein, 2002; 2008). In other settings, pre-existing property rights may help coordinate economic activity back to its initial equilibrium (Nunn, 2014). In contrast, those displaced by the expulsion here were not the same as those with the potential to restore prior economic geography thereafter, leaving large amounts of property unowned in the interim. As a result, other factors such as physical capital were also removed from the borderlands after the expulsion, making convergence even less probable.

Table 9. *Urban Change Around the MAL, 1930–47.*

	ln Population density (1)	Agricultural sector (2a)	Secondary sector (2b)	Transport sector (2c)	Business sector (2d)
$\Delta_{'47-'30}$ln borderlands	−0.190	4.046	−0.311	−0.221	−1.306
(linear in distance)	(0.048)***	(1.868)**	(1.810)	(0.400)	(0.515)**
R^2	0.919	0.590	0.760	0.673	0.635
$\Delta_{'47-'30}$ln borderlands	−0.296	6.390	−3.389	−0.003	−1.959
(linear in x and y)	(0.028)***	(1.129)***	(1.064)***	(0.294)	(0.244)***
R^2	0.914	0.584	0.748	0.685	0.624
Mean dep. var.	4.738	27.921	41.238	3.472	6.067
in 1930	(0.703)	(13.711)	(12.950)	(1.962)	(2.677)
Observations	330	330	330	330	330
Clusters	98	98	98	98	98
Border segments	24	24	24	24	24
Bandwidth	25 km	25 km	25 km	25 km	25 km
Year	1930–47	1930–47	1930–47	1930–47	1930–47

Notes: All regressions exclude Prague and Polish Zaolzie, include census year, year×border segment and judicial district fixed effects as well as exogenous controls for elevation, ruggedness, precipitation, temperature and river density (km per km^2), all interacted with census year and utilise a local linear running variable of either distance from the MAL interacted with the treatment and year or longitude and latitude interacted with year. Coefficients denote differences in discontinuities in 1947 from the corresponding estimates in Tables 2 and 3. Units of observation are judicial districts. Robust standard errors are clustered by political district, with ***, ** and * denoting significance at the 1%, 5% and 10% levels, respectively.

4.3. *Urban Decay*

Today, over 1,000 abandoned settlements dot the borderlands, while countless others remain sparsely populated seven decades since the expulsion of their former German residents (Glassheim, 2015). The origins of such 'urban decay' can be traced to the immediate post-expulsion period, when smaller towns failed to attract enough settlers, while local authorities and 'gold-diggers' exploited and looted confiscated German property.

To see this, I modify the LBC approach above to estimate differences between relative outcomes in 1930, prior to the expulsion, and those in mid-1947, after the expulsion and the borderlands' initial resettlement had wound down but prior to the advent of communism in 1948. In particular, I adopt a 'local' difference-in-differences (DD) model,

$$y_{dbt} = \alpha + \beta InBorderlands_d \times \mathbb{Y}_{1947} + f(location_{dt}) + \mathbf{X}_d'\Gamma_t + \mathbb{Y}_t + \Sigma_{bt} + \Delta_d + \varepsilon_{dbt},$$

which is equivalent to differencing (1) across years t, indicated by the dummy $\mathbb{Y}_t$, using time-invariant district fixed effects Δ_d while allowing the effects of the running variable $f(location_{dt})$, border segments Σ_{bt}, and geography $\mathbf{X}_d$ to vary over time. This estimates the effect of being in the borderlands at the MAL in mid-1947 *relative* to the same effect in 1930. I use the same running polynomials and bandwidths as above, with robustness for these and other short-run outcomes in Tables A.29–32 in the Supplemental Material.

I begin by estimating a local DD for population density. Whereas differences in population density between the regions were relatively smooth and stable over time prior to the expulsion, as shown in Table 2, Table 9 shows that population density had become relatively lower in the borderlands after the expulsion and remained as such following the large-scale resettlement discussed above—even in easily accessible areas near the MAL. This is consistent with the historical literature, in which only 1.3 million settlers had arrived and remained by mid-1947

(Daněk, 1995; Gerlach, 2017). In combination with Czechs living in the borderlands pre-1938, its population was still below two thirds its prior size.

This suggests that the expulsion of the Germans indeed triggered a 'de-urbanisation' of the borderlands as a region, relative to the interior, with the region becoming more rural *on average* relative to before.[36] To explore this further, I consider a second important dimension of urban development: sectoral structure. Columns (2a–d) in Table 9 show a structural shift toward agriculture occurring alongside declines in density by the time expulsion and resettlement had concluded in mid-1947. I estimate a relative increase in the share of the labour force in the borderlands working in agriculture of about 4 pp at the MAL—about a 15% increase in the size of the local agricultural labour force from 1930. Much of this shift stems from a shrunken business sector, i.e., finance, insurance, trade and other commerce.

These patterns also persist over the long-run, i.e., through the communist period as well as since transition. Because more highly-aggregated district boundaries were established after the coup, I adopt a more 'global' DD approach that uses all districts to compare differences in interior and borderland districts' population density and sectoral structure from 1921 to 2011 relative to pre-expulsion differences.[37] Table 10 shows that, while differences in density appear to shrink somewhat during the communist period due to relatively high fertility offsetting negative net migration,[38] they have grown since liberalisation, suggesting that state investments under central planning may have cushioned the borderlands somewhat.

I also find the shift toward agriculture to be persistent, offset by growing industry differences. This reflects how, after resettlement wound down in the late 1940s, migration *out* of the borderlands occurred by many skilled workers as 'administrative conflicts, a lack of suitable settlers, labour shortages, and property squabbles' beset them (Gerlach, 2017, p. 14).[39] After transition—when state investments in steel, coal and other industries were reduced and their labour forces transitioned into sectors like banking and the auto industry—industry differences shrank and service sector differences widened (Illner and Andrle, 1994). This mirrors Table 5, in which borderland municipalities in 2011 showed lower employment shares in many service-based sectors.[40] Hence, the data show that the expulsion of the Germans generated an immediate urban divergence within in the Czech lands, at the expense of the former Sudetenland, that persists long after the conclusion of intervening shocks.

Beyond showing that urban decay followed from the expulsion, implications of such decay as it pertains to the persistence of effects can be drawn using the same data set as used above for capital loss but for abandoned urban areas (i.e., villages, settlements, hamlets, and parts of towns). In Table A.26 in the Supplemental Material, I show that having one documented abandoned urban area per square km coincides with additional relative increases in unemployment and decreases in education in the borderlands. This suggests that a decrease in the size and number of local markets as entailed by this sustained loss of cities fed into declines in local demand for labour and human capital, hindering subsequent upward mobility in those places. Combined with the

[36] This is not to say the borderlands experienced a de-urbanisation *within*. In fact, the relative decline of many of its smaller towns likely left a *higher* percentage of its residents in large urban areas.

[37] To aggregate districts, I utilise a harmonisation approach previously used in Hornbeck (2010) and Bazzi *et al.* (2020). This procedure is also used in Table A.24, which replicates this global DD using only districts within 50 km of the MAL while dropping those that overlap it, and described in the Supplemental Material.

[38] See Table A.25 for migration patterns using the same DD approach.

[39] See Figure A.9 for a heatmap of out-migration by 1950 districts.

[40] In contrast, agriculture has tended to remain dispersed smoothly through the MAL over time, despite still being relatively more prominent in the borderlands 'globally'.

Table 10. *Long-Run Panel, 1921–2011.*

	ln Population density (1)	Agricultural sector (2a)	Industry (2b)	Service sector (2c)
In borderlands×1921	−0.011	−0.954	0.115	0.835
	(0.015)	(0.739)	(0.691)	(0.323)**
In borderlands×1930	0	0	0	0
In borderlands×1947	−0.310	3.277	–	−1.466
	(0.036)***	(0.847)***		(0.662)**
In borderlands×1950	−0.298	3.725	−2.676	−1.272
	(0.036)***	(0.889)***	(1.026)**	(0.844)
In borderlands×1961	−0.299	–	−4.639	–
	(0.054)***		(1.238)***	
In borderlands×1970	−0.272	3.025	−4.297	−0.284
	(0.056)***	(0.982)***	(1.201)***	(0.904)
In borderlands×1980	−0.238	3.186	−3.538	−0.862
	(0.058)***	(1.125)***	(1.339)**	(0.862)
In borderlands×1991	−0.214	3.148	−3.975	−0.523
	(0.060)***	(1.200)**	(1.450)***	(0.842)
In borderlands×2001	−0.203	2.839	−1.840	−2.282
	(0.059)***	(1.600)*	(1.998)	(0.952)**
In borderlands×2011	−0.245	2.845	−2.621	−5.050
	(0.056)***	(1.748)	(2.057)	(1.070)***
R^2	0.423	0.872	0.719	0.958
Observations	730	657	657	657
Clusters	73	73	73	73

Notes: All regressions exclude Prague and Polish Zaolzie and include census year and district fixed effects as well as controls for longitude, latitude and each interacted with census year. Units of observation are districts (1991 boundaries). To construct common district boundaries used for this panel analysis and others, I use the harmonisation procedure described in the Supplemental Material. All other districts are included in this regression, with districts assigned to the region with >50% of their area. See Table A.24 for a more restrictive approach. Robust standard errors are clustered by district, with ***, ** and * denoting significance at the 1%, 5% and 10% levels, respectively.

persistent time paths of effects for density and interregional migration in Tables 10 and A.25, this is consistent with theoretical work in economic geography linking differences in regional agglomeration with labour market disparities, reinforced by labour mobility and pooling (Epifani and Gancia, 2005; Francis, 2009), and speaks to the overall coincidence of regional agglomeration and unemployment disparities observed in Section 3.

4.4. *Regional Human Capital Inequalities*

Recall that there was little difference in average literacy around the MAL prior to the expulsion of the Germans. However, compositional changes associated with post-expulsion migration and the borderlands' subsequent urban decay may have generated differences in human capital between the regions, making it relatively more concentrated in the interior. This in turn could have fed back into sectoral change (Moretti, 2004), locking in human capital inequalities between the regions over the longer-run. Such a pattern would be consistent with the historical narrative that settlers were disproportionately unskilled (Radvanovský, 2001; Glassheim, 2016), as well as the finding that the borderlands is less educated today.

While no data exist on educational attainment for the post-war Czech lands until 1961, some evidence that the borderlands already had lower human capital post-resettlement can be found by examining regional school enrollment patterns in mid-1947, after the main waves of expulsion

Table 11. *Short-Run Educational Effects, Mid-1947.*

	Primary & lower secondary		Upper secondary		Tertiary
	Enrollment, general$_{5\text{-}14}$ (1a)	Enrollment, civic$_{10\text{-}14}$ (1b)	Enrollment, agricultural$_{15\text{-}19}$ (2a)	Enrollment, vocational$_{15\text{-}19}$ (2b)	Enrollment, college$_{15\text{-}24}$ (3)
In borderlands (linear in distance)	5.651 (0.967)***	−8.204 (2.661)***	7.174 (1.817)***	−12.980 (5.15)**	−2.926 (0.449)***
R^2	0.867	0.589	0.485	0.241	0.734
In borderlands (linear in x and y)	6.959 (0.728)***	−7.669 (2.395)***	5.562 (1.374)***	−6.293 (4.398)	−2.574 (0.374)***
R^2	0.86	0.591	0.517	0.214	0.724
Mean dep. var. in interior	52.694 (2.398)	57.142 (5.513)	5.762 (3.951)	17.031 (11.208)	3.215 (1.358)
Observations	115	115	115	115	115
Border segments	16	16	16	16	16
Bandwidth	50 km	50 km	50 km	50 km	50 km
Year	1947	1947	1947	1947	1947

Notes: All regressions exclude Prague and Polish Zaolzie, include border segment fixed effects as well as exogenous controls for elevation, ruggedness, precipitation, temperature and river density (km per km^2) and utilise a local linear running variable of either distance from the MAL interacted with the treatment or longitude and latitude. Units of observation are political districts. All outcomes represent enrollment in a given type of schooling as a share (out of 100) of the relevant age population. Robust standard errors reported in brackets, with ***, ** and * denoting significance at the 1%, 5% and 10% levels, respectively.

and resettlement had wound down. Until the coup in 1948, Czechoslovakia had eight years of compulsory education. For primary education, children attended a general school (*obecná škola*) for five years. Following this, one could either complete his or her education with three more years at a general school or pursue a more advanced lower secondary education. Commonly, this entailed attending a civic school (*měšťanská škola*) for three years. This in turn was a prerequisite for subsequent upper secondary (e.g., vocational) education.[41]

Upon examining differences in school enrollment in mid-1947 between the post-expulsion, post-resettlement borderlands and nearby interior areas, I find that rates of enrollment in general schools among the relevant age group were significantly *higher* in the borderlands. Given that all primary school-age children were enrolled in general schools regardless of region, this had to have been driven by differences at the lower secondary level—namely, a greater share of 10- to 14-year-olds in the borderlands forgoing civic schooling in favour of the terminal general school track. Consistent with this, I find that civil school enrollment rates among 10- to 14-year-olds were significantly *lower* in the borderlands in mid-1947 relative to those of nearby interior areas. This can be seen in Table 11.

This also means that there would have been relatively fewer students in the borderlands going on to pursue more advanced education. Column (3) confirms strikingly lower rates of college enrollment in the borderlands relative to the interior in mid-1947, about a 90% decrease from crossing the MAL. Yet there were also differences in the *types* of schooling being pursued among advanced students. To show this, I examine enrollment data from mid-1947 for two common types of upper secondary schools: basic vocational schools (*základní odborná škola*) and agricultural folk schools (*lidová škola zemědělská*). The former provided education specific to a variety of trades, while the latter were meant for those going into agriculture. Examining these, I observe another striking trend, which mirrors the sectoral changes observed above: while

[41] For more, see Michalička and Svojtkova (1972) and Greger *et al.* (2012).

basic vocational schooling was significantly less popular among those living in the borderlands in mid-1947 relative to those in nearby interior areas, enrollment in agricultural folk schools among the relevant age group was >100% higher. This suggests that even among those in the borderlands who *did* go on to pursue advanced education, there was a tendency to invest in agricultural skills over other, more technical skills.

Overall, these findings are consistent with the notion that those who selected into the borderlands after the expulsion of three million Germans had less demand for advanced and technical education, relative to those who stayed in nearby interior areas. In contrast, I do not find consistent evidence that these early patterns were driven by supply-side factors. Table A.27 in the Supplemental Material shows that, while the borderlands' civic schools may have had slightly fewer teachers per pupil relative to nearby interior ones, its general and agricultural schools exhibited similar shortages despite having higher relative enrollment, while its vocational schools had *greater* teacher–pupil ratios on average. Moreover, the college enrollment measure in Table 11 exclusively measures demand, insofar as the location of college enrollment is not restricted to the district of observation in the data.

Hence, despite Germans and Czechs previously having similar levels of education, the expulsion of the Germans generated a loss of human capital in former-German areas beginning with compositional changes they endured during their resettlement. Of course, it is difficult to discern to what extent this was driven by a lack of skilled workers selecting into the borderlands versus fewer incentives to become skilled there due to a lack of skill-intensive sectors. More than likely there was a feedback between the two, reinforced by more permanent labour market changes. Consistent with this, long-run trends show alongside the sectoral changes in Table 10 downturns in education that persist to today (see Table A.28). Given similar changes in density, this is also consistent with recent theoretical and empirical work in economic geography, showing human capital spillovers to be an important force driving urban and labour market density (Duranton and Puga, 2004; Moretti, 2004).

4.5. *Additional Channels*

This article shows a persistent spatial divergence in local development within the Czech lands following the 1945 expulsion of three million Germans from its borderlands. It has also discussed the origins of these patterns, which emerged immediately following the expulsion and persist decades after. That being said, there may be other forces contributing to the persistence of or variation in such differences. I now consider three additional channels.

4.5.1. *Natural geography*

The analysis thus far controls for locational fundamentals, with physical geography being smooth through the MAL. Alternative specifications using only geographically cohesive (i.e., flat through the MAL) parts of the sample yield similar long-run effects, as shown in Table A.15 in the Supplemental Material. Yet strong locational fundamentals may nonetheless have helped mitigate the expulsion's long-run effects within the borderlands. Since access to water may contribute to economic performance through improved agriculture or transport, I expand the analysis by interacting the treatment variable (and running variable, where applicable) with a mean-normalised river density control, which indicates km of waterways per square km in each municipality. Estimates suggest a possible, albeit noisy, attenuation effect from the presence of rivers on some

long-run effects. These can be found in Table A.33. I find minimal evidence of any such effect for ruggedness.

4.5.2. *Central planning*

The expulsion and the borderlands' resettlement occurred prior to the communist coup of 1948, when Czechoslovakia's labour economy still operated to a large extent via the market mechanism (Bernàšek, 1970). However, it is important to consider to what extent central-planning institutions helped *preserve* this divergence post-1947. If signs of convergence are observed as having occurred around the MAL since transition, then it might mean that this persistence had more to do with active central-planning decisions, whereas local losses in, e.g., density may not have persisted to the same extent in a market economy.

To test this, I consider in Table A.34 trends in relevant outcomes between 2001 and 2011, after the end of communism and the restructuring of the 1990s. Differences in density and unemployment remain highly stable near the MAL. I find similar stability for sector shares, although the construction sector declines somewhat *more* as a share of the labour force in the borderlands relative to the interior in both specifications. Yet overall, and despite large-scale structural change since transition, differences remain remarkably flat. This, combined with the overall persistence of patterns during communism and through transition (e.g., those in Table 10), downplays the importance of central-planning institutions. That being said, the communist regime itself plays a key role here, as discussed in Subsection 4.2.

4.5.3. *Market access and international relations*

For various reasons, the borderlands was likely a less appealing place to live during the Cold War: for instance, its proximity to West Germany and Austria (e.g., due to damaged trade networks, as well as poor international relations and fear of expellee return), as well as economic isolation associated with the Iron Curtain in places closer to Poland and East Germany (Redding and Sturm, 2008). However, it is unclear whether such factors would have mattered *at the MAL*, where borderland and interior areas were similarly distant from the national border.

I begin by examining whether living in the borderlands ever entailed greater economic isolation in areas near the MAL. To measure this, I look for differences in the density of railways through the MAL in 1930, 1940, 1960 and today (Donaldson and Hornbeck, 2016). I find no evidence of decreased market access in the borderlands relative to the interior in any time period. Furthermore, upon comparing effects in areas closer to the Eastern Bloc (East Germany and Poland) versus West Germany and Austria, I do not find smoothness to vary across space.[42] Note that this does not imply a lack of increased isolation closer to the national border, where trade might be more limited in one direction. Indeed, one advantage of my identification strategy is that borderland areas being studied are close to the interior and often quite far from the national border. Hence, economic isolation does not seem to be driving short- or long-run local effects, either overall or associated with, e.g., the Iron Curtain. These results can be found in Table A.35 in the Supplemental Material.

It is still possible that proximity to West Germany and Austria would have entailed other economic disadvantages, given the tensions of the post-war era. For instance, after WWII, the Czechoslovak government intentionally kept parts of the borderlands on the West German border emptied as a military buffer zone (Illner and Andrle, 1994). Table A.36 shows

[42] See Figure A.17 in the Supplemental Material for these maps.

several of the baseline long-run regressions with an interaction term for whether a municipality was closer to Eastern Bloc areas prior to 1989. I find no differential effects here either.

5. Discussion and Conclusion

For centuries, Czech- and German-speaking peoples lived alongside each other, growing the whole of the Czech lands into one of the most developed parts of Europe by the early twentieth century (Klein and Ogilvie, 2016). Yet the rise of nationalism and the events of WWII changed that forever, culminating in the expulsion of three million Germans in 1945. This article documents how that event continues to influence the relative development of former-German areas and economic geography of the Czech lands more than half a century later.

Though this analysis has focused extensively on how these effects emerged and persisted, numerous questions inevitably remain. For instance, what role did communism play in driving persistence relative to what would have persisted regardless? On one hand, the persistence of effects through transition and the relative stability of trends around the former German 'language border' today suggests that central planning was unnecessary *ex post* for persistence. On the other hand, this article documents how the communists extracted capital and raw materials from the borderlands following its initial de-urbanisation, as discussed in Section 4. As such, it remains unclear how effects might have differed had Czechoslovakia been more like Austria or Finland during the Cold War. Future work should delve deeper into how this period of central planning matters for long-run effects (i.e., post-transition). This would tell us more about both the channels of persistence in this particular setting, as well as the extent to which policy can influence long-run development more generally.

Household-level data collection and analysis is also needed. This might entail examining narrow areas around the former language border, as in Karaja and Rubin (2017), to better understand the choice to resettle the borderlands as well as transmission mechanisms at play at a more micro level.

Finally, external validity remains a concern in the literature on forced migration, as expulsion and similar events often occur during wartime and in poorly institutionalised settings. Given the continued importance of studying forced migration, future research should examine and compare effects in a variety of institutional and historical settings, including forced migration as a result of non-political factors such as climate change.

This article provides several important lessons for understanding forced migration, at a time when the number of forcibly displaced worldwide is about 80 million. First, it illustrates how such events may affect not only targeted groups but also have long-term implications for development and regional inequality within the origin economy. Moreover, it shows that forced migration can have strong and persistent effects even when compositional factors such as human capital are similar across treated and control areas. This is no trivial insight. While previous research has focused on expulsions involving relatively high-skilled minorities, forced migration has plagued groups from many backgrounds throughout history. This should give political leaders pause when considering the displacement of any minority group, as doing so may leave a lasting mark on the places left behind.

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Additional Supporting Information may be found in the online version of this article:

Online Appendix
Replication Package

References

Abramitzky, R., Boustan, L.P. and Eriksson, K. (2014). 'A nation of immigrants: assimilation and economic outcomes in the Age of Mass Migration', *Journal of Political Economy*, vol. 122(3), pp. 467–506.

Acemoglu, D. and Dell, M. (2010). 'Productivity differences between and within countries', *American Economic Journal: Macroeconomics*, vol. 2(1), pp. 169–88.

Acemoglu, D., Johnson, S. and Robinson, J.A. (2002). 'Reversal of fortune: geography and institutions in the making of the modern world income distribution', *Quarterly Journal of Economics*, vol. 117(4), pp. 1231–94.

Acemoglu, D., Hassan, T.A. and Robinson, J.A. (2011). 'Social structure and development: a legacy of the Holocaust in Russia', *Quarterly Journal of Economics*, vol. 126(2), pp. 895–946.

Agnew, H. (2004). *The Czechs and the Lands of the Bohemian Crown*, Stanford: Hoover Institution Press.

Akbulut-Yuksel, M. and Yuksel, M. (2015). 'The long-term direct and external effects of Jewish expulsion in Nazi Germany', *American Economic Journal: Economic Policy*, vol. 7(3), pp. 58–85.

Allen, T. and Donaldson, D. (2018). 'Persistence and path dependence in the spatial economy', published as Working Paper 28059 by the National Bureau of Economic Research (NBER) in Nov. 2020.

Amtliches Deutsches Ortsbuch für das Protektorat Böhmen und Mähren. (1940). Prague: Reichsprotektor in Böhmen und Mähren.

Arbatli, C.E. and Gokmen, G. (2019). 'Ethnic capital and sub-national development: Armenian and Greek legacy in post-expulsion Turkey', Working Paper, CESifo Working Paper Series.

von Arburg, A. (2001). *Die Besiedlung der Grenzgebiete der böhmischen Länder 1945–1950*, Vienna: University of Vienna.

ARCDATA PRAHA. (2017). https://www.arcdata.cz/ (last accessed: 2 August 2020).

Armstrong, H.F. (1939). 'Armistice at Munich', *Foreign Affairs*, vol. 17(2), pp. 197–290.

Bach, T. (1923). 'Education in Czechoslovakia', *Department of the Interior Bureau of Education*, Bulletin, 1922, No. 39, pp. 1–26.

Bauer, T.K., Braun, S.T. and Kvasnicka, M. (2013). 'The economic integration of forced migrants: evidence for postwar Germany', Economic Journal, vol. 123(571), pp. 998–1024.

Bazzi, S., Fiszbein, M. and Gebresilasse, M. (2020). 'Frontier culture: the roots and persistence of 'rugged individualism' in the United States', *Econometrica*, vol. 88(6), Forthcoming.

Becker, S.O. and Ferrara, A. (2019). 'Consequences of forced migration: a survey of recent findings', *Labour Economics*, vol. 59(C), pp. 1–16.

Becker, S.O., Grosfeld, I., Grosjean, P., Voigtländer, N. and Zhuravskaya, E. (2020). 'Forced migration and human capital: evidence from post-WWII population transfers', *American Economic Review*, vol. 110(5), pp. 1430–63.

Bell, B., Fasani, F. and Machin, S. (2013). 'Crime and immigration: evidence from large immigrant waves', *Review of Economics and Statistics*, vol. 21(3), pp. 1278–90.

Bernàšek, M. (1970). 'Czechoslovak planning, 1945–48', *Soviet Studies*, vol. 22(1), pp. 94–109.

Bleakley, H. and Lin, J. (2012). 'Portage and path dependence', *Quarterly Journal of Economics*, vol. 127(2), pp. 587–644.

Bosker, M., Brakman, S., Garretsen, H. and Schramm, M. (2007). 'Looking for multiple equilibria when geography matters: German city growth and the WWII shock', *Journal of Urban Economics*, vol. 61(1), pp. 152–67.

Braun, S.T., Kramer, A., Kvasnicka, M. and Meier, P. (2020). 'Local labour markets and the persistence of population shocks: evidence from West Germany, 1939–70', *Journal of Economic Geography*, Forthcoming.

Bryant, C. (2002). 'Either German or Czech: fixing nationality in Bohemia and Moravia, 1939–1946', *Slavic Review*, vol. 61(4), pp. 683–706.

Bryant, C. (2007). *Prague in Black: Nazi Rule and Czech Nationalism*, London: Harvard University Press.

Chaney, E. and Hornbeck, R. (2016). 'Economic dynamics in the Malthusian era: evidence from the 1609 Spanish expulsion of the Moriscos', Economic Journal, vol. 126(594), pp. 1404–40.

Conley, T. (1999). 'GMM estimation with cross sectional dependence', *Journal of Econometrics*, vol. 92(1), pp. 1–45.

Cornwall, M. (1994). 'The struggle on the Czech-German language border, 1880–1940', *English Historical Review*, vol. 109(433), pp. 914–51.

Daněk, P. (1995). 'Towards cultural regionalization of the Czech lands: Sudeten half a century after the transfer', *Geography*, vol. 1995(25), pp. 41–60.

Davis, D.R. and Weinstein, D.E. (2002). 'Bones, bombs, and break points: the geography of economic activity', *American Economic Review*, vol. 92(5), pp. 1269–89.

Davis, D.R. and Weinstein, D.E. (2008). 'A search for multiple equilibria in urban industrial structure', *Journal of Regional Science*, vol. 48(1), pp. 29–65.
Dell, M. (2010). 'The persistent effects of Peru's mining *mita*', *Econometrica*, vol. 78(6), pp. 1863–903.
Dell, M. and Olken, B.A. (2019). 'The development effects of the extractive colonial economy: the Dutch Cultivation System in Java', *Review of Economic Studies*, vol. 87, pp. 164–203.
Donaldson, D. and Hornbeck, R. (2016). 'Railroads and American economic growth: a "market access" approach', *Quarterly Journal of Economics*, vol. 131(2), pp. 799–858.
Droller, F. (2017). 'Migration, population composition, and long-run economic development: evidence from settlements in the Pampas', Economic Journal, vol. 127(614), pp. 1–32.
Duranton, G. and Puga, D. (2004). 'Micro-foundations of urban agglomeration economies', in (J.V. Henderson and J. Thisse, eds.), *Handbook of Regional and Urban Economics*, vol. 4, pp. 2063–117, New York: North Holland.
Epifani, P. and Gancia, G.A. (2005). 'Trade, migration, and regional unemployment', *Regional Science and Urban Economics*, vol. 35(6), pp. 625–44.
Erlikhman, V. (2004). *Poteri Narodonaseleniia v XX Veke: Spravochnik*, Moscow: Russkaia Panorama.
Eugster, B., Lalive, R., Steinhauer, A. and Zweimüller, J. (2017). 'Culture, work attitudes, and job search: evidence from the Swiss language border', *Journal of European Economic Association*, vol. 15(5), pp. 1056–100.
Feigenbaum, J.J., Lee, J. and Mezzanotti, F. (2019). 'Capital destruction and economic growth: the effects of Sherman's March, 1850–1920', NBER Working Paper 25392.
Foged, M. and Peri, G. (2016). 'Immigrants' effect on native workers: new analysis on longitudinal data', *American Economic Journal: Applied Economics*, vol. 8(2), pp. 1–34.
Francis, J. (2009). 'Agglomeration, job flows and unemployment', *Annals of Regional Science*, vol. 43(1), pp. 181–98.
Gelman, A. and Imbens, G. (2018). 'Why high-order polynomials should not be used in regression discontinuity designs', *Journal of Business and Economic Statistics*, vol. 37(3), pp. 447–56.
Gerlach, D. (2017). *The Economy of Ethnic Cleansing: The Transformation of the German–Czech Borderlands after WWII*, New York: Cambridge University Press.
Glassheim, E. (2001). 'The mechanics of ethnic cleansing: the expulsion of Germans from Czechoslovakia, 1945–47', in (P. Ther and A. Siljak, eds.), *Redrawing Nations: Ethnic Cleansing in East-Central Europe*, pp. 197–219, Lanham, MD: Rowman & Littlefield.
Glassheim, E. (2015). 'Unsettled landscapes: Czech and German conceptions of social and ecological decline in the postwar Czechoslovak borderlands', *Journal of Contemporary History*, vol. 50(2), pp. 318–36.
Glassheim, E. (2016). *Cleansing the Czechoslovak Borderlands: Migration, Environment, and Health in the Former Sudetenland*, Pittsburgh: University of Pittsburgh Press.
Goldstein, E. (1999). 'Neville Chamberlain, the British official mind and the Munich crisis', *Diplomacy & Statecraft*, vol. 10(2–3), pp. 276–92.
Greger, D., Levínská, M. and Smetáčková, I. (2012). 'Priority education policies in the Czech Republic: redesigning equity policies in the post-communist transformation', in (M. Demeuse, D. Frandji, D. Greger, and J.Y. Rochex, eds.), *Educational Policies and Inequalities in Europe*, London: Palgrave Macmillan.
Grosfeld, I., Rodnyansky, A. and Zhuravskaya, E. (2013). 'Persistent antimarket culture: a legacy of the Pale of Settlement after the Holocaust', *American Economic Journal: Economic Policy*, vol. 5(3), pp. 189–226.
Guzi, M., Huber, P. and Mikula, Š. (2019). 'Old sins cast long shadows: the long term impact of the resettlement of the Sudetenland on residential migration', Working Paper, IZA.
HGISe. (2020). http://europa.udl.cat (last accessed: 2 August 2020).
Hornbeck, R. (2010). 'Barbed wire: property rights and agricultural development', *Quarterly Journal of Economics*, vol. 125(2), pp. 767–810.
Hornung, E. (2014). 'Immigration and the diffusion of technology: the Huguenot diaspora in Prussia', *American Economic Review*, vol. 104(1), pp. 84–122.
Hsiang, S.M. (2010). 'Temperatures and cyclones strongly associated with economic production in the Caribbean and Central America', *Proceedings of the National Academy of Sciences*, vol. 107(35), pp. 15367–72.
Illner, M. and Andrle, A. (1994). 'The regional aspect of post-communist transformation in the Czech Republic', *Czech Sociological Review*, vol. 2(1), pp. 107–27.
Jedwab, R. and Moradi, A. (2016). 'The permanent effects of transportation revolutions in poor countries: evidence from Africa', *Review of Economics and Statistics*, vol. 98(2), pp. 268–84.
Jedwab, R., Johnson, N. and Koyama, M. (2019). 'Pandemics, places, and populations: the effects of the Black Death on urban development', Working Paper, Centre for Economic Policy Research.
Johnson, N.D. and Koyama, M. (2017). 'Jewish communities and city growth in preindustrial Europe', *Journal of Development Economics*, vol. 127(C), pp. 339–54.
Jelínek, J. (2011). *Analýza Topografických Map 1:50000 z Období Protektorátu Čechy a Morava*, Bachelor thesis, Masaryk University, Masaryk University Information System.
Judson, P.M. (2006). *Guardians of the Nation: Activists on the Language Frontiers of Imperial Austria*, Cambridge: Harvard University Press.
Karaja, E. and Rubin, J. (2017). 'The cultural transmission of trust norms: evidence from a lab in the field on a natural experiment', Working Paper, Chapman University.

King, J. (2002). *Budweisers into Czechs and Germans: A Local History of Bohemian Politics, 1848–1948*, Princeton: Princeton University Press.
Klein, A. and Ogilvie, S. (2016). 'Occupational structure in the Czech lands under the second serfdom', *Economic History Review*, vol. 69(2), pp. 493–521.
Kline, P. and Moretti, E. (2014). 'Local economic development, agglomeration economies, and the big push: 100 years of evidence from the Tennessee Valley Authority', *Quarterly Journal of Economics*, vol. 129(1), pp. 275–331.
Krugman, P. (1991). 'Increasing returns and economic geography', *Journal of Political Economy*, vol. 99(3), pp. 483–99.
Lee, D.S. and Lemieux, T. (2010). 'Regression discontinuity designs in economics', *Journal of Economic Literature*, vol. 48(2), pp. 281–355.
Maier, S. (2006). *Das Grenzdurchgangslager Furth im Wald 1946–57*, Stamsried: Vögel.
Maloney, W.F. and Caicedo, F.V. (2015). 'The persistence of (subnational) fortune', Economic Journal, vol. 126(598), pp. 2363–401.
'Mapa o stavu vozovek Československy´ch, silnic. 1. díl, Země Česká a Moravskoslezská. 1:650000'. (1930). Prague: Autoklub RČS. https://digitool.is.cuni.cz/R/?func=dbin-jump-full&object_id=1168737 (last accessed: 2 August 2020).
Michalička, M. and Svojtkova, V. (1972). *Rozvoj Československého všeobecně vzdělávacího a odborného školství v letech 1945–1970*, Prague: Pedagogický ústav J.A. Komenského (Československá akademie věd).
Michalopoulos, S. and Papaioannou, E. (2013). 'Precolonial ethnic institutions and contemporary African development', *Econometrica*, vol. 81(1), pp. 113–52.
Moretti, E. (2004). 'Human capital externalities in cities', in (J.V. Henderson and J. Thisse, eds.), *Handbook of Regional and Urban Economics*, vol. 4, pp. 2243–91, New York: North Holland.
Moscona, J., Nunn, N. and Robinson, J.A. (2020). 'Segmentary lineage organization and conflict in sub-Saharan Africa', *Econometrica*, vol. 88(5), pp. 1999–2036.
Murard, E. and Sakalli, S.O. (2019). 'Mass refugee inflow and long-run prosperity: lessons from the Greek population resettlement', Working Paper, IZA.
Nunn, N. (2008). 'The long-term effects of Africa's slave trades', *Quarterly Journal of Economics*, vol. 123(1), pp. 139–76.
Nunn, N. (2014). 'Historical development', in (P. Aghion, and S.N. Durlauf, eds.), *Handbook of Economic Growth*, vol. 2A, pp. 347–402, Amsterdam, Netherlands: Elsevier North Holland.
Ochsner, C. (2017). 'Dismantled once, diverged forever? A quasi-natural experiment of Red Army misdeeds in post-WWII Europe', Working Paper, ifo Working Paper Series.
Kudlich, J., Prihoda, P., Grulich, R. and Odsun:, Die Vertreibung der Sudetendeutschen. (1995). Munich: Sudetendeutsches Archiv.
OECD. (2006). *OECD Economic Surveys: Czech Republic 2006*, Paris: OECD Publishing.
'Osídlení pohraničí v letech 1945–1952'. (1953). *Zprávy a rozbory*, Praha: Státní úřad statistický.
Overmans, R. (2004). *Deutsche Militärische Verluste im Zweiten Weltkrieg*, Munich: Oldenbourg.
Pascali, L. (2016). 'Banks and development: Jewish communities in the Italian Renaissance and current economic performance', *Review of Economics and Statistics*, vol. 98(1), pp. 140–58.
Peters, M. (2019). 'Market size and spatial growth: evidence from Germany's postwar population expulsions', Working Paper, Columbia University.
Puga, D. (1999). 'The rise and fall of regional inequalities', *European Economic Review*, vol. 43(2), pp. 303–34.
Radvanovský, Z. (2001). 'The social and economic consequences of resettling Czechs into Northwestern Bohemia, 1945–47', in (P. Ther and A. Siljak, eds.), *Redrawing Nations: Ethnic Cleansing in East-Central Europe*, pp. 241–60, Lanham, MD: Rowman & Littlefield.
Redding, S.J. and Sturm, D.M. (2008). 'The costs of remoteness: evidence from German division and reunification', *American Economic Review*, vol. 98(5), pp. 1766–97.
Redding, S.J., Sturm, D.M. and Wolf, N. (2011). 'History and industry location: evidence from German airports', *Review of Economics and Statistics*, vol. 93(3), pp. 814–31.
Rocha, R., Ferraz, C. and Soares, R.R. (2017). 'Human capital persistence and development', *American Economic Journal: Applied Economics*, vol. 9(4), pp. 105–36.
Ruiz, I. and Vargas-Silva, C. (2013). 'The economics of forced migration', *Journal of Development Studies*, vol. 49(6), pp. 772–84.
Schumann, A. (2014). 'Persistence of population shocks: evidence from the occupation of West Germany after WWII', *American Economic Journal: Applied Economics*, vol. 6(3), pp. 189–205.
Semrad, A. (2015). 'Immigration and educational spillovers: evidence from Sudeten German expellees in post-war Bavaria', Working Paper, Munich Discussion Paper.
Sequeira, S., Nunn, N. and Qian, N. (2019). 'Immigrants and the making of America', *Review of Economic Studies*, vol. 87(1), pp. 382–419.
Slomková, V. (2016). *Děti a válka: rok 1945 ve vzpomínkách pamětníku z Berounska a Plzeňska*, Thesis, Charles University, Charles University Digital Repository.
Spurný, M. (2013). 'Reliability and the border: the discourse of the Czech borderlands, 1945–49', *Austrian Journal of Political Science*, vol. 42(1), pp. 83–94.

Sudetendeutsches Ortsnamenverzeichnis: Amtliches Gemeinde- und Ortsnamenverzeichnis der nach dem Münchener Abkommen vom 29. 9. 1938 (Grenzfestlegung vom 20.11.1938) zum Deutschen Reich gekommenen sudetendeutschen Gebiete. (1987). Munich: Sudetendeutsches Archiv.
Tabellini, G. (2010). 'Culture and institutions: economic development in the regions of Europe', *Journal of the European Economic Association*, vol. 8(4), pp. 677–716.
Tampke, J. (2003). *Czech-German Relations and the Politics of Central Europe*, New York: Palgrave Macmillan.
Testa, P.A. (2020). 'Shocks and the spatial distribution of economic activity: the role of institutions', *Journal of Economic Behavior & Organization*, Forthcoming.
Theater History of Operations Reports (THOR). (2019). https://data.world/datamil/world-war-ii-thor-data (last accessed: 3 August 2020).
United Nations High Commissioner for Refugees. (2019). https://www.unhcr.org/globaltrends2019/ (last accessed: 3 August 2020).
URRlab. (2017). http://www.urrlab.cz/ (last accessed: 2 August 2020).
U.S. Congress, House of Representatives, Committee of Foreign Affairs. (1947). *Background Information on European Countries: Political Conditions and Economic Recovery Problems*, Washington D.C.: U.S. Government Printing Office.
U.S. Department of State Office of the Historian. (1945). 'Document 450: The Ambassador in France (Caffery) to the Secretary of State', *Foreign Relations of the United States: Diplomatic Papers*, Europe, Volume IV. https://history.state.gov/historicaldocuments/frus1945v04/d450 (last accessed: 2 August 2020).
Waldinger, F. (2010). 'Quality matters: the expulsion of professors and the consequences for PhD student outcomes in Nazi Germany', *Journal of Political Economy*, vol. 118(4), pp. 787–831.
Wiedemann, A. (2016). *'Pojd' s Námi Budovat Pohraničí!': Osídlování a Proměna Obyvatelstva Bývalých Sudet 1945–1952*, Prague: Proster.
Winkler, E. (1936). 'Nationalitätenkarte der Sudetenländer (Böhmen, Mähren-Schlesien), 1:750,000', Karlsbad-Leipzig: Karl H. Frank.
Wiskemann, E. (1938). *Czechs and Germans: A Study of the Struggle in the Historic Provinces of Bohemia and Moravia*, London: Oxford University Press.
Zahra, T. (2008). *Kidnapped Souls: National Indifference and the Battle for Children in the Bohemian Lands, 1900–48*, Ithaca: Cornell University Press.
Zaniklé obce a objekty. (2018). http://zanikleobce.cz/ (last accessed: 3 August 2020).
de Zayas, A. (1989). *A Terrible Revenge: The Ethnic Cleansing of the East European Germans, 1944–50*, New York: St. Martin's Press.