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ABSTRACT

Crossing Borders: Labor Market Effects of European Integration*

This paper investigates an EU policy reform that granted Czech citizens full access to the German labor market. Exploiting the fact that the reform specifically impacted the Czech and German border regions, I use a matched difference-in-differences design to estimate local labor markets effects in both countries. I show that the Czech border region experienced a decline in unemployment rates and an increase in vacancies, while local labor markets in Germany remained unaffected. Overall, my findings suggest that the Czech border region faced labor shortages, while local labor markets in Germany were able to fully absorb the migrant inflow.

JEL Classification: J61, J15, R23

Keywords: out-migration, in-migration, local labor markets

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1 Introduction

The impact of worker outflows and inflows is at the center of recent policy debates in OECD countries. Origin countries, some of which struggle with ageing populations and skilled worker shortages[1], are concerned about dampened economic growth as a result of talent outflows. In destination countries, the policy debate often revolves around fears that migrant inflows may depress wages and result in job losses for native workers. In both types of countries, there are public discussions on whether emigration and immigration may have contributed to the rise in populism in recent years.

While there are extensive bodies of literature on the labor market effects of in-migration on destination countries (e.g., Beerli et al. 2021; Dustmann et al. 2017; Ottaviano and Peri 2012; Borjas 2003; Card 1990) and on the consequences of out-migration on origin countries (e.g., Bütikofer et al. 2024; Dustmann et al. 2015; Elsner 2013b; Clemens 2011; Aydemir and Borjas 2007), almost no study analyzes the impact of one immigration policy on both origin and destination countries simultaneously. Previous studies often treat the destination and origin country labor markets as separate; however, in many real-world settings, they are integrated local labor markets with substantial cross-border exchange.

In this paper, I investigate the long-term labor market effects of both out-migration and in-migration using the 2004 EU enlargement as a case study. To estimate causal effects, I exploit the spatial variation in the extent to which the policy affected Czech and German regions: I show that when Germany opened its labor market to workers from its neighboring country the Czech Republic in 2011, the majority of Czech migrants began commuting to German municipalities in close proximity to the border, suggesting that location, rather than the economic situation in a given German municipality, played a role in Czech workers' mobility decisions. On the German side of the border, the labor supply of medium-skilled workers (i.e., workers with vocational training) increased as a result of the Czech worker inflow, which is consistent with the findings from previous studies that migrants from Eastern Europe are relatively high-skilled (Kahanec and Pytliková 2017; Zaiceva and Zimmermann 2008). The great advantage of this setting is that it allows me to investigate the effects of

[1]For example, half of all Central, Eastern, and Southeastern European countries are expected to lose 5% of their population by 2030, and 15% by 2050 (Batog et al., 2019).

the *same* migration flow on both the origin and destination country.

The opening of the German labor market to Czech workers in 2011 was the result of one of the largest policy reforms in the history of the EU: the accession of eight Central and Eastern European countries in 2004. When Germany opened its labor market to Czech workers in 2011, they were allowed to work in Germany without a visa or work permit and with exactly the same rights as German nationals.[2] Given the substantially lower wages in Eastern Europe than Western Europe, this policy reform predominantly led to migration flows from east to west.[3]

To study the labor market effects of this worker outflow and inflow, I analyze a novel dataset on Czech regions provided by the Czech Statistical Office and detailed social-security data for Germany, provided by the Institute for Employment Research (IAB). For each country, I estimate separate difference-in-differences regression models, comparing the border region to a set of matched control regions before and after the policy change.

As a starting point, I provide evidence on the inflow of Czech workers to Germany. I show that by 2017, the share of Czech workers in the West German border region had increased by 5 percentage points relative to 2010 and compared to matched control regions.[4] For the border regions in the Czech Republic, this corresponded to a similarly strong outflow of about 2-4ppt of the working age population in 2011-2017. There was a much smaller inflow of Czech workers to East Germany, amounting to only about .4ppt in the post-opening period.

[2]Germany, together with Austria, had delayed access to its labor market for fear of negative effects on native workers for the maximum possible amount of time (e.g., Sinn, 2000), but it was legally obliged to open it in 2011 (see Section 2 for more details). Other countries such as the UK and Sweden opened their borders immediately. See Figure C1 for the details.

[3]According to data provided by the Czech Statistical Office, the average monthly gross wage in the Czech regions bordering West Germany in 2010 was approximately 840 EUR. The average monthly gross wage of a German worker on the other side of the border in 2010 was approximately twice that. Figure 1, Panel (d), shows that the share of German residents in the Czech border region increased by about .2% in the post-enlargement period.

[4]The average yearly increase in 2011-2017 was 2.6ppt, representing a 198% increase of the baseline mean. The Czech immigrants were predominantely medium-skilled, male, and earned about 83% of native workers' wages (see Table 1 and Figure E3). One caveat of the policy reform for my empirical analysis is that it granted labor market access not only to Czech workers, but to workers from any EU8 country (the EU8 countries include the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia). This means that migration to the matched control regions also increased after 2011, making the labor market shock less sharp. As a result, the increase in the *overall* migrant share was lower but still substantial, reaching 3ppt by 2017, with an average yearly increase in 2011-2017 of 1.7ppt (or 49% of the baseline mean). This suggests that my estimates for Germany represent lower bounds compared to a scenario without other migrant flows to the country.

In my baseline analysis, I therefore focus on West Germany.

In a next step, I show how the Czech worker outflow affected the labor market in the Czech border region relative to matched controls. Following 2011, unemployment rates in Czech border counties relative to matched control regions substantially decreased (-6.5% relative to the average in 2010), while vacancies increased by 138% relative to the mean in 2010. In line with this, the number of applicants per job decreased by almost 11% relative to the average in 2010, indicating an increasingly tight labor market. This suggests that the integration of the Czech and the German labor market benefited Czech workers while causing labor shortages for Czech firms.

For West Germany, I find no aggregate effects on unemployment rates, native employment, or native full-time wages. If anything, the overall unemployment rate slightly decreased (-0.7ppt after 2011). Consistent with these findings, I show that there were no displacement effects for a cohort of German workers employed in the matched regions in 2010. Moreover, there was no decline in vacancies in the German border region; if anything, vacancies began to increase around 2015. Overall, this suggests that the German border region was characterized by highly elastic labor demand, with firms taking advantage of the increase in labor supply.

One challenge for my analysis is that, due to their geographic location, border regions may have been affected differently by changes in trade or outsourcing. While both barriers to trade flows and German FDI in the Czech Republic dropped with the fall of the iron curtain, and began to expand, in the 1990s (e.g., Dauth et al. (2014) and Schäffler et al. (2017)), the improved connectedness between the two regions after 2011 may have reduced information frictions and thus altered these dynamics (as in Burchardi et al. (2019)). To address this, I start by matching regions based on industry shares. In addition, I exploit a unique dataset with information on the share of German firms with Czech affiliates in Germany and German subsidiaries in the Czech Republic (Schäffler and Moritz, 2018). I also show that import and export exposure evolved similarly for matched regions in Germany and that my results for the Czech Republic are robust to detailed industry share reweighting.

My estimates hold up to a variety of robustness checks. For example, I show that they are robust to variations in the matching specification, such as adding additional matching

variables, varying the year in which I measure the matching variables, or using propensity score matching instead of mahalanobis distance matching as in the baseline. A synthetic difference-in-differences estimation likewise yields largely comparable results. I also present specifications where I change the border region definition for Germany, and where I focus on the Czech border region to Germany, only. Results from placebo treatment regressions show no effects.

This paper contributes to the literature on the labor market effects of the 2004 EU Enlargement. Most existing studies concentrate on the impact of immigration on destination countries, often in specific industries such as construction (e.g. Kuosmanen and Meriläinen, 2023; Bratsberg et al., 2023; Åslund and Engdahl, 2019; Schmieder and Weber, 2018; Lemos and Portes, 2014). Hammer and Hertweck (2022) is a comparable study for Germany, which shows how immigration after 2011 affected native workers' wages and employment. Using an instrumental variable approach, they find negative short-term wage effects and positive effects on native employment.

I add to these studies by showing how local labor markets evolved in response to the policy reform in both the destination and origin country. The conclusions I draw are not only relevant for policymakers interested in evaluating the labor market effects of the EU enlargement. More generally, I provide insights into the dynamics involved in the event of the large-scale, long-term labor market integration of two neighboring countries during a period of economic growth. Another study that analyzes both origin and destination country simultaneously is Dodini et al. (2024), who examine worker reallocations in Sweden and Norway in response to a labor demand shock caused by rising oil prices. The setting in Dodini et al. (2024) differs from the Czech-German labor market integration for two reasons: First, the labor markets of the two countries were already integrated before the labor demand shock. Second, ex-ante wage differentials between Sweden and Norway were much lower than between Germany and the Czech Republic.

This paper is also related to studies on the labor market effects of cross-border commuting, in particular to Dustmann et al. (2017) and Beerli et al. (2021). Dustmann et al. (2017) assess a commuting policy in the Czech-German border region from 1991-1993, 20 years prior to the policy studied here. Focusing on the German side of the border only,

they report a sharp decline in regional-level native employment and a moderate decline in regional-level native wages. Beerli et al. (2021) consider a commuting reform that granted European cross-border workers free access to the Swiss labor market in 2004, showing that it led to increased labor demand in skill-intensive firms.

Studies on the labor market effects of immigration have shown that immigration has the potential to reduce native workers' wages (e.g., Bratsberg and Raaum (2012)), but that it can also benefit some groups like low-skilled workers (e.g., Docquier et al. (2014)). This is because natives and migrants may be only imperfectly substitutable: Ottaviano and Peri (2012) and Foged and Peri (2016) show that low-skilled natives can benefit from immigration by upgrading to better-paid occupations. It is therefore important to take into account immigrants' skills relative to natives (Peri, 2016).

In addition, my analysis is inspired by studies investigating the effects of out-migration. DiCarlo (2022) studies a Swiss commuting policy and shows that worker outflows resulted in decreased productivity for Italian firms. Bütikofer et al. (2024) and Hafner and Hedtrich (2024) find positive wage and employment effects for stayers as a result of out-migration in relatively wealthy European border regions. Studies on out-migration more generally, such as Dustmann et al. (2015), Elsner (2013a), Elsner (2013b) and Aydemir and Borjas (2007), document that stayers benefit from worker outflows in terms of wage increases. Clemens (2011) shows that there are large efficiency gains to eliminating barriers to emigration from low-income countries. I contribute to this literature by providing evidence on regional unemployment rates and vacancies in a context with high cross-country wage differentials and cross-border flows.

The remainder of the paper is organized as follows. Section 2 describes the 2004 EU enlargement and the free movement of labor policy, followed by a conceptual framework in Section 3. Section 4 provides an overview of the Czech and German data. Section 5 discusses the empirical strategy, including the matching method. Section 6 presents the results, with a discussion of robustness checks in Section 7. Section 8 concludes.

2 Institutional Background

The Policy Reform: EU Enlargement The focus of this paper is the 2004 EU enlargement in which eight Central and Eastern European countries (EU8) as well as Malta and Cyprus joined the EU.[5] The enlargement corresponds to one of the largest policy reforms in the history of the EU, resulting in 75 million new citizens, a number just below the overall population of the EU's largest member state, Germany.

Within the EU, the "four freedoms" apply: the free movement of capital, goods, services, and labor.[6] I focus on the free movement of labor, a regulation entailing that any EU citizen can work in another EU country without the need to apply for a visa or work permit. This means that the same hiring conditions apply for a worker from, e.g., the Czech Republic as for a German worker, and native workers are not given priority.

Fearing downward wage pressure and displacements, Germany and Austria delayed access to their labor markets for workers from the new EU countries until May 2011.[7] The opening of the German labor market was widely discussed in advance, and both firms and workers may have anticipated the incoming worker flows. Pre-reform adjustments to firms' capital may have helped local labor markets better absorb the shock.

Trade and FDI Figure C1 provides an overview of the Eastern-Western European integration process, which began with the fall of the iron curtain in 1989. Around this time, German citizens began crossing the border into the Czech Republic to buy, e.g., relatively cheap cigarettes and fuel. In 2004, the Czech Republic became a member of the EU, resulting in increased political and economic exchanges between the two countries. Cross-border exchanges increased once more with the elimination of border controls (the *Schengen Agreement*) in 2007.

It is possible that during the period under study, not only migration flows changed, but trade flows between Germany and the Czech Republic increased, potentially reinforced by

[5] The full list of EU8 countries is the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia.

[6] See Dorn and Zweimüller (2021); Kahanec and Zimmermann (2016, 2010) for more general overviews on migration in the course of European integration.

[7] For workers from Malta and Cyprus, the German labor market was opened immediately in 2004. Therefore, in this paper, I mostly refer to the EU8 countries excluding Malta and Cyprus.

migration flows (Muñoz, 2024). This was indeed the case: According to the UN Comtrade Database (UN Comtrade, 2024), goods exports from Germany to the Czech Republic increased by a factor of 1.3 between 2007 and 2017. This rate was, however, almost three times as large in the 1990s and early 2000s.[8] Similarly, while German firms had already begun investing in the Czech Republic in the 1990s and 2000s (Körner et al., 2021), the 2011 labor market opening, through a reduction in information frictions, may have further reinforced these investments (Burchardi et al., 2019). In this study, I address these potential confounding factors by carefully accounting for the local industry mix in my matching algorithms. To address concerns related to FDI, I moreover utilize a dataset that includes all German firms with affiliates in the Czech Republic, along with their locations in both Germany and the Czech Republic.

Comparison of the Setting to Dustmann et al. (2017) In terms of the setting, this paper is most closely related to Dustmann et al. (2017), who assess a commuting policy in the Czech-German border region from 1991-1993, 20 years prior to the policy studied here. Compared to the labor market opening in the course of the EU Enlargement that I study in this paper, the commuting policy was much smaller: Czech worker migration was locally restricted to specific border counties in West Germany and the inflow led to a backlash among native workers in the mid 1990s, with a subsequent reduction in the share of Czech workers (see Dustmann et al. (2017)). In addition, the German border region at that time was much less well connected to the rest of Europe than in the 2010s, when, e.g., a number of German firms with affiliates in the Czech Republic had moved to the German border region (see Hecht, 2017; Schäffler et al., 2017). Finally, Czech workers in the early 1990s were, on average, less skilled than those who arrived following the labor market opening in 2011, implying a different type of competition for native workers.

Dustmann et al. (2017) report a sharp decline in regional native employment and a moderate decline in native wages, while I find no such effects. The main reason for this is probably higher labor demand in the 2010s relative to the 1990s. As Figure E1 shows, the share of firms reporting labor shortages in Germany was substantially higher in the

[8] See Dauth et al. (2014) for detailed evidence on German trade with Eastern European countries.

2010s (13%) than in the 1990s (8%). Labor demand around the 2011 opening was therefore presumably much more elastic than in the early 1990s. In addition, the border region had moved from the periphery of the EU in the early 1990s to its heart; this improved geographic position may have helped absorb the labor supply shock. Through my empirical strategy, I am able to rule out that differences in import and export intensity between German border regions and matched controls confound the estimated labor market effects.

3 Conceptual Framework

The canonical model of labor supply shocks offers predictions for the potential effects of a migration policy reform. I base my discussion in this section on Borjas (2014).

Let us assume a world according to neoclassical theory, where labor markets are fully competitive, workers are perfectly substitutable, labor and capital are the sole production inputs, and both inputs are fully mobile. Imagine that one country in this frictionless world - the Czech Republic - offers relatively low wages, whereas another country - Germany - offers high wages. This is the steady state as long as there is no exchange of workers between these two countries. If the two countries' labor markets integrate, theory predicts that the workers will move from the Czech Republic to Germany until the wages in both countries equalize. If we allow for mobility to be costly, the Czech workers would not move to just anywhere in Germany but would prefer the border region.

For the Czech Republic, this means the following: a negative labor supply shock, as would be induced by a worker outflow, increases the return to labor and decreases the return to capital. The standard model predicts that in the long term, firms would adjust their stock of capital to return to the original capital/labor ratio. However, in the case of Czech-German labor market integration, there are two factors that may make it harder for firms to react optimally. First, the outflow of Czech workers was not sharp and sudden but happened gradually over time. The share of Czech workers in the German border region increased slightly even during 2016-2017, the last years in my data. Firms have thus faced a constant outflow of workers and may have had to constantly update their expectations. Second, 76% of Czech workers employed in Germany commute across the border (see Table 1). This means that the majority of Czech consumption of goods and services occurs in their home

country; given Czech workers' higher wages in Germany, demand for local goods is likely to increase. Firms in the border region could thus find themselves in a situation in which they must produce more but face difficulties hiring new workers.

For Germany, theory predicts the opposite pattern: a positive labor supply shock decreases native wages and increases the return to capital in the short term. Given the context of cross-border commuting, the increase in labor supply would not be offset by a rise in demand for domestic goods in the German border region.[9]

Why might the labor market opening not affect German workers? There are several potential explanations. For example, in one extension of the canonical model, Borjas (2014) proposes a nested CES framework that takes into account heterogeneous labor. In this model, the aggregate production function has two distinct labor inputs: high-skilled labor and low-skilled labor. The impact of the labor supply shock on native wages thus depends on the degree of substitutability between the two types of workers, i.e., their elasticity of substitution. It is possible that Czechs were complements, rather than substitutes for Czech workers.

In addition, although the standard model assumes that except for labor, all other production units remain the same, this assumption has caveats, as discussed in Peri (2012) and Beerli et al. (2021). The Czech commuter flow could have increased firm productivity in Germany and the Czech Republic, thus raising firm demand. This is consistent with my finding that vacancies in the German border region increased after 2011.

4 Czech and German Labor Market Data

For my empirical analysis, I use two datasets on establishments and workers from the Institute for Employment Research (IAB) as well as regional-level data from the Czech Statistical

[9]Note that the setting at hand, in contrast to e.g., Dustmann et al. (2017), does not entail a clear-cut commuting policy. As Figure E4, Panel (a), suggests, a small share of Czech workers actually relocated to Germany. Moreover, Figure E4, Panel (b), shows that about one fifth of the EU8 worker inflow to the border region stemmed from other nationalities (e.g., Slovaks or Poles) many of whom fully relocated to Germany. The opening of the German labor market thus must have increased the demand for goods and services in the German border region, even though this increase would have been much larger had all Czech workers fully relocated to Germany.

Office.[10] In addition, I combine my German data with spatial data from the German Federal Institute for Research on Building, Urban Affairs, and Spatial Development (BBSR).

4.1 Regional-Level Data

Czech Republic For the Czech Republic, I use county- and municipality-level data from the Czech Statistical Office from 2005-2017. The county-level data have the advantage of containing a rich set of labor market variables that I use for my matching analysis (see Section 5 for more information on the matching procedure). Importantly, the county-level data provide information on unemployment rates and vacancies. In addition, they contain information on population size by age group, the number of firms in a given industry, and crime statistics. I define all counties bordering either Germany or Austria as the treatment region. After matching these counties to suitable controls, I enrich the data using information on unemployment rates and vacancies, which is available at the municipality level. Altogether, there are 6258 Czech municipalities and 77 Czech counties.

Germany For Germany, I start with establishment-level data, the *Establishment History Panel (BHP)*[11], which contains the universe of German establishments with at least one employee subject to social security contributions as of June 30 each year (Eberle and Schmucker (2017)). The data include an extensive set of establishment variables such as the number of (native) employees, average and median (native) wages, an establishment's skill composition, and its industry. Importantly for my analysis, the data also contain information on the municipality where an establishment is located. I aggregate the data to the municipality level.[12]

In the next step, I combine the municipality data with spatial data provided by the BBSR. These data contain information on each municipality's centroid, allowing me to compute the driving time in minutes to the nearest road border crossing into the Czech Republic. I define my treatment group as all German municipalities located within 60-minutes driving

[10] Note that throughout this paper, I use the terms "firm" and "establishment" interchangeably. What I observe in the German data are establishments, where several establishments could belong to the same firm.

[11] I use the following version: IAB Betriebs-Historik-Panel (BHP) 1975-2019 version, Grundgesamtheit.

[12] As of December 2018, there were 11,014 municipalities in Germany. The size of a municipality is much smaller than that of a NUTS-3 region (county), of which Germany has 401.

time to the nearest border crossing. I then use mahalanobis distance matching to match the treatment municipalities to suitable control municipalities. In Section 5 and in the Appendix Section A3, I describe the matching process in more detail.

Figure 1, Panel (a), provides an intuition for why I chose 60-minutes as the threshold for my definition of the border region. It plots the share of Czech workers (by 2010 employment) in a given German municipality by the municipality's driving time to the nearest border crossing into the Czech Republic. In this figure, I use the complete set of German social security data, restricting it to all municipalities located up to 120 minutes from the nearest border crossing. The four lines correspond to different years before and after the policy reform (2008, 2011, 2015, and 2017). The figure shows that the closer a municipality is located to the border, the greater the share of Czech workers. For municipalities located more than 60 minutes away from the border, the Czech worker share is close to 0.

4.2 Worker-Level Data for Germany

For the second part of my paper, I follow Dauth and Eppelsheimer (2020) in preparing worker-level data from the *Integrated Employment Biographies (IEB), Version 16*, which comprise the universe of workers subject to social security contributions in Germany. From this dataset, I draw a 10% sample of workers in matched municipalities from 2005-2017. This dataset contains a rich set of variables and comes with several advantages. Importantly, it includes administrative information on worker nationalities, which enables me to cleanly identify Czech workers. It moreover reports both native and Czech workers' exact workplaces at the municipality level, helping me to identify the treated workers. For the Czech workers, I also know whether they live in Germany or abroad. In addition, the data include information on days worked, daily wages, and skill group for each worker. From the spell data, I construct a yearly panel based on observations on June 30. I correct implausible education entries following Fitzenberger et al. (2006) and deflate wages using the consumer price index for Germany with base year 2010.

Czech and German Workers Table 1 presents the summary statistics for native and Czech workers in the German border region. Column (1) reports native worker characteristics

in 2010, and Column (2) reports Czech worker characteristics in 2012.[13] Perhaps unsurprisingly, Czech workers' yearly earnings are substantially lower (16,200 EUR vs. 19,300 EUR). This is because they earn lower wages (difference of 8 EUR/day) while they work almost exactly the same number of days per year (270 vs. 269). A total of 67.5% of Czech workers are male, and 76% report that they do not live in Germany. The Czech migrants are somewhat younger (39.1 vs. 41.3 years), and most of them - 62.7% - are medium-skilled, meaning that they acquired vocational training.[14]

5 Empirical Strategy: Difference-in-Differences and Matching

The aim of my study is to estimate the effect of cross-border commuting by Czech workers on local labor markets in both the Czech Republic and Germany as well as on native incumbent workers' labor market outcomes. To achieve this, I proceed in three steps. First, I apply mahalanobis distance matching to match (i) border municipalities to suitable control municipalities in Germany and (ii) border counties to suitable control counties in the Czech Republic.[15] I match without replacement, meaning that each region is assigned one distinct control observation.[16] Second, I use a dynamic difference-in-differences regression analysis to estimate the effect of the labor supply shock on labor market outcomes in the regions on either side of the border.

Third, I conduct an additional analysis focusing on native incumbent workers in Germany. Here, I use a combination of exact matching and mahalanobis distance matching to find a

[13]Note that to understand the inflows of workers to Germany, a comparison of native workers with EU8 workers may be more relevant. I include such a table in the Online Appendix (Table B4) showing that the main patterns are very similar.

[14]The vocational training systems in the Czech Republic and Germany are comparable in type and length; in both countries, training lasts approximately 2-3 years. In the Czech Republic, vocational training is referred to as *Střední odborné učiliště*. It includes a 2-3 year curriculum with alternating periods of education and apprenticeship work for individuals without a high school diploma. The typical occupations are craft trades. Previous studies have found that migrants are often downgraded upon entering the German labor market, as labor market experience is not fully transferable across countries (see, e.g., Brücker et al. (2021)). It is thus not clear that a Czech worker with vocational training is a perfect substitute for a German worker with vocational training.

[15]The reason why I match on the county level in the Czech Republic is that for the Czech Republic, there is no detailed labor market data available on the municipality level. For Germany, I decided to make use of the much more detailed municipality-level data which enables a more precise treatment definition (by distance to the Czech-German border).

[16]See Appendix Section A3 for more details on the variables used in the matching process.

unique match for each native worker in the border region (under common support) from the pool of workers in the control municipalities. All workers are employed in the matched regions in 2010.

5.1 Mahalanobis Distance Matching

Czech Republic I start with 1:1 mahalanobis distance matching for the Czech counties. The treatment region is defined as all Czech counties bordering either Germany or Austria. I match these counties to suitable control counties using a number of matching variables that are plausible predictors of the future development of wages and employment in the Czech regions. These are the population's working age share, the share of firms in manufacturing, the share of firms in agriculture, the unemployment rate, log vacancies, log population size (all measured in 2010), the share of firms that are subsidiaries of a German firm (quartiles), and the share of firms with 1-49 employees. Panel (b) of Figure C2 shows how the treatment and control counties are spatially distributed across the Czech Republic.

Germany For Germany, I complete a similar matching exercise. Using data on the universe of German establishments aggregated to the municipality level, I first identify my treatment region as all German municipalities located within 60-minutes driving time from the nearest Czech-German road border crossing. I then match these municipalities, separately for East and West Germany, to suitable German control municipalities using the following variables: share of workers in the age groups 15-29 and 30-49, share of low- and medium-skilled workers, share of female workers, share of migrant workers, share of firms in the service sector (2010), share of firms in the manufacturing sector, share of firms in agriculture, log wages, unemployment rate, the share of firms that have an affiliate in the Czech Republic (quartiles), export exposure to EU10 countries (all measured in 2010). In addition, I match on the growth in EU workers' employment in 2004-2010, and the employment growth in 2008-2010. From the pool of potential controls, I drop municipalities located less than 80km from the German-Polish border, since they could be subject to increased immigration from Poland. See Appendix Section A3 for more details.

Note that I match on the growth in EU workers' employment in 2004-2010 to ensure that

treated and control regions are on a similar track with respect to their pre-reform experience in migrant employment. Moreover, I do so to ensure that if there were network effects in the sense that EU8 workers moved to municipalities with a high share of workers of the same nationality, these effects would be similar across treatment and control regions. Panel (a) of Figure C2 shows how the treatment and control municipalities are spatially distributed across Germany.

Summary Statistics for the Czech Republic Tables 2 presents summary statistics on how the Czech matched regions differ before the policy change in 2011, and how they compare to the average Czech region. A comparison of all regions (Column 1) to the matched regions (Columns 2 and 3) shows that the matched regions are slightly negatively selected: their unemployment rates were, on average, higher. There were no large differences with respect to firm composition or demographics, except that the border region has the highest share of German-owned firms (.255%).[17] Column (4) reports the differences between Columns (2) and (3) and shows that the mahalanobis distance matching generally worked well in terms of balancing treatment and control group. Besides the share of German-owned firms, the two variables that are statistically significantly different are the average age in the region (slightly lower in the border region), and the average number of deaths (lower in the border region).

Summary Statistics for West Germany Table 3 provides summary statistics for West Germany. Comparing the matched regions (Columns 2 and 3) to all West German municipalities in the dataset (Column 1) shows that the matched regions have a lower average share of migrant workers (Panel A), and both lower import and export exposure (Panel D). With respect to the demographic composition, the matched regions have a somewhat higher percentage of medium-skilled workers in their workforce. Comparing the matched regions, Column (4) shows that there are small differences between treated and control regions, which - albeit statistically significant - are not large in economic terms. The share of migrant workers in border municipalities is slightly lower (difference of 0.77ppt), and the share of EU

[17] I will address this in a robustness check where I exclude the two counties with the top shares of German-owned firms.

migrants slightly higher (difference of 0.48ppt). Reassuringly, as I show in Figure E4, the trend in the share of workers from the EU8 is similar, and constant, in both groups. In addition to the share of migrant workers, mean (native) daily wages are somewhat higher in the matched controls relative to the border region (EUR 2 per day). Despite this difference in levels, my event study coefficients in Figure 3 show that native wages were on the same trend before 2011. Importantly, as Panel (d) shows, import and export exposure of matched regions are very similar. The share of firms with an affiliate in the Czech Republic is considerably higher in the border region (.35%); I will address this in a robustness check where I replicate my main results when excluding these firms. Note that B8 presents summary statistics for all of Germany (including East and West) and shows largely similar patterns.

5.2 Dynamic Difference-in-Differences Regression

After completing the matching procedure, I estimate dynamic difference-in-differences (event study) regressions at the regional level, which - for German municipalities - take the following form:

$$y_{prt} = \sum_{t=2007}^{2017} \beta_t * I(year = t) * [I(treated = r)] + \alpha_r + \gamma_{pt} + X_{it}\delta + \varepsilon_{prt} \quad (1)$$

where y_{prt} is the outcome variable, e.g., native wages, for matched pair p of treatment-control regions r in year t. I interact each year t with a dummy indicating whether region r is in the treatment group $I(treated = r)$, i.e., whether it is located 60-minutes driving time from the nearest border crossing into the Czech Republic.[18] The coefficients of interest are β_t, which indicate the differential development of treatment municipalities compared with that of control municipalities by year. I estimate all coefficients relative to the base year, 2010, which I omit. The municipality fixed effects α_r in the regression model account for time-invariant municipality characteristics and year trends. Following Dube et al. (2010), I moreover add matched pair $\times$ year fixed effects γ_{pt} to the regression model, such that I only use variation within each matched treatment-control pair. For employment and wage

[18]Note that the regression model for the Czech regional-level analysis is very similar, with the exception that my treatment region is defined as all counties with a direct border with Germany or Austria. For the Czech Republic, I do not include $X_{it}\delta$ because the necessary data to construct it is unavailable.

outcomes, I additionally add a Bartik-style control $X_{it}\delta$ that accounts for industry-driven local demand shocks (see Section A1.3 for details). I report standard errors clustered at the county level. The key identifying assumption of my regression model is that in the absence of the labor supply shock, the treatment and control regions would have evolved in the same way. I cannot test this assumption, but I can show how the two groups evolved pre-treatment. Ideally, I would not observe any significant differences pre-treatment. As Figures 1, 2 and 3 show, my main results largely pass the visual inspection of no statistically significant pre-treatment trends across groups.

5.3 Worker-Level Matching and Regression Analysis

Next, I prepare the worker-level data for Germany. I consider only incumbent workers; these are workers who were employed in the treated and control municipalities on June 30 in 2010. In a next step, I use a combination of exact matching with mahalanobis distance matching to find matched worker pairs (see Section A3.3 for details).

The reason for the additional matching is that while I could simply compare all workers in the border region to all workers in the control region, this comparison is not necessarily valid. This is because for the regional matching, I considered solely regional-level outcomes stemming from the establishment-level data. These characteristics, such as wages or workforce composition, also reflect worker outcomes, but they do not necessarily ensure that native incumbent workers are on the same labor market trajectories before 2011.

This is also evident from the data. Table B1 presents summary statistics for all treated and control workers in the matched regions (columns 1 and 2) and for the sample in which each treated worker has a unique control match (columns 3 and 4). While several characteristics, such as days worked per year and age, are already similar in the unmatched sample, control workers in this sample are 1.4ppt less likely to have a full-time job; treated workers are almost twice as likely to work in a firm with an affiliate in the Czech Republic. As shown in Tables B3 and B2, while the overall distributions are comparable, there are non-negligible differences in the distribution across 1-digit industries and occupations for unmatched workers. My goal with the worker-level matching is to ensure that such differences do not bias my results.

For the worker-level analysis, the baseline regression equation is as follows:

$$y_{pit} = \sum_{t=2007}^{2017} \beta_t * I(year = t) * [I(treated = i)] + \alpha_i + \gamma_{pt} + \varepsilon_{pit} \quad (2)$$

where y_{pit} is the outcome variable, e.g., native wages, for matched pair p of treatment-control workers i in year t. I interact each year t with a dummy indicating whether a worker i is in the treatment group $I(treated = i)$, meaning that they were employed in the German border region to the Czech Republic in 2010. As in Equation 1, I estimate coefficients relative to 2010. I add worker fixed effects α_i and matched pair $\times$ year fixed effects γ_{pt}, and cluster standard errors at the worker level.

5.4 Challenges for the Empirical Strategy

One important assumption for my empirical strategy to identify the plain effects of both out-migration and in-migration is that the Czech control regions did not experience emigration, while the German control regions did not experience immigration. In both cases, this is unlikely to fully hold: Neither were there mobility restrictions in other parts of the Czech Republic, nor did Germany limit immigration to the border region. The policy reform was moreover widely discussed and could have been anticipated by firms on both sides of the border, meaning that they might have, e.g., adjusted their capital in advance. Taking all of this into account, my point estimates are likely lower bounds of the true effect of both emigration and immigration. However, from a policy perspective, my estimates may hold more external validity than estimates from a setting of sudden migration flows that are limited both geographically and temporarily.

I provide evidence to alleviate some of these concerns. While I do not have data on Czech emigration by region within the Czech Republic, I can demonstrate that the vast majority of Czech workers are concentrated in the German border region adjacent to the Czech Republic. Figure 1, Panel (a), provides evidence that the share of Czech workers declines sharply with increasing distance from the border. Figure E2 further supports this, illustrating on a map that the highest share of Czech workers is found in German counties bordering the Czech Republic. In Figure E4, Panel (a), I show that the vast majority of

Czech workers are reported as residing abroad, strongly suggesting that they commute across the border. This serves as further evidence that the Czech border region was particularly affected by worker outflows. While the absence of relevant data prevents me from displaying Czech out-commuting rates by region, it is highly unlikely that large numbers of Czechs commute to Germany from the country's interior. Finally, Figure D1, Panels (a) and (b), indicates that emigration – defined as permanent relocation — from Czech control regions was minimal.[19]

For Germany, I show that the share of migrant workers also increased in German control regions post 2011, although not as much as in the border region (Figure C4). Overall, this points to a relatively high labor demand in the years following Germany's quick economic recovery after the financial crisis.[20]

6 The Impact of Out-Migration and In-Migration on Local Labor Markets

6.1 Cross-Border Migration Flows

The Inflow of Czech Workers to West Germany Figure 1, Panel (b), shows that the share of Czech workers increased by about 5ppt between 2010 and 2017 in the West German border region compared to matched control municipalities. In contrast, the inflow of Czech workers to the East German border region was much lower, reaching approximately 1ppt by 2017 (Figure E6). This is why I focus on West Germany for the main analysis.

One potential concern is that while the share of Czech workers increased in the border region, the matched control regions were subject to an inflow of workers from other EU8 countries. In Figure C4, I thus plot the inflow of EU8 workers and all migrant workers. Panel (a) plots the raw means, and Panel (c) plots the respective event study coefficients. It shows that the inflow of both EU8 and migrant workers was stronger in the border region compared to matched controls, resulting in an increase of 4.2ppt and 3ppt by 2017, respectively (see Table F2 for the exact coefficients). This increase is not as pronounced as the inflow of Czech

[19] See A1 for details on data construction.

[20] Migrant inflows to Germany increased not only from EU8 countries. Many migrants from Southern Europe, which had been hit particularly hard by the financial crisis, began working in Germany in the 2010s. For example, according to numbers provided by the German Statistical Office (Destatis), yearly inflows from Italy more than doubled between 2008-2013, increasing from 20,087 to 47,485.

workers, meaning that my results for Germany provide a lower bound for the labor market effects in a (hypothetical) scenario where migration was restricted solely to the border region.

The Outflow of Czech Workers from the Czech Republic Figure 1, Panel (c), descriptively plots the change in the share of Czechs commuting abroad between 2011 and 2021, reported in the Czech Population Census on the regional level of *kraje*[21]. It shows two things: First, Czech administrative districts bordering Poland and Slovakia did not experience any increase in the share of citizens commuting abroad. In contrast, the share of commuters in the districts bordering Germany almost doubled, reaching 2% of the total population by 2021.

Figure D1 shows the Czech commuter outflow for border vs. control counties in the Czech Republic, implying a substantial outflow of almost 4ppt between 2011-2017 as a share of the working age population in the border region to West Germany. At less than 2ppt, the outflow from the regions bordering East Germany is much lower, probably reflecting worse employment opportunities in this part of the border region.[22] See Appendix Section A1 for details on the data construction.

German Residents in the Czech Republic While I do not observe German workers or commuters in the Czech Republic, the Czech Statistical Office provides information on the number of German residents by county. Panel (d) of Figure 1 shows a steady increase in the share of German residents, with a concentration in the Czech border region. This increase began as early as 2005 — unlike Germany, the Czech Republic immediately opened its labor market to German workers. There is moreover a noticeable jump in 2007 following the elimination of border controls. Between 2010 and 2017, the share of German residents rose by approximately 0.2 percentage points in the Czech border region compared to matched controls. By 2017, there were 11,500 German residents in the Czech border region, amounting to 0.8% of the German workforce on the German side of the border in that year.

Most of these Germans emigrated from East Germany; Figure C14 shows almost no

[21]There are 14 *kraje*, or administrative districts, in the Czech Republic. The next lower regional level, on which I base my baseline analysis, consists of 77 *okresy*, or counties.

[22]I exclude the border region to Austria from the sample, because I do not have data on commuter figures for adjacent regions in Austria.

increase in the share of Germans in Czech regions bordering West Germany. It is therefore unlikely that the outflow of German workers somehow affects my main results for West Germany.

6.2 The Effect of Out-Migration on Regions in the Czech Republic

Figure 2 presents the evolution of unemployment rates (Panels a and c) and vacancies relative to vacancies in 2009 (Panels b and d) in the Czech border region compared to matched control counties. Panels (a) and (b) report the raw means, while Panels (c) and (d) plot the β_t coefficients from Equation 1. In line with the standard assumptions of the difference-in-differences approach, there are no statistically significant differences between treated and control counties in the years leading up to the policy change.

Starting in 2011, there is a clear downward trend in the unemployment rates in the Czech border region, amounting to 1.1ppt by 2017 (see Table F1 for the exact coefficients by year).[23] For context, the average border county reported unemployment rates of approximately 9% in 2010. For vacancies, we observe the reverse pattern: relative vacancies started to increase in the border region relative to the control municipalities after 2011, peaking at 184% in 2017 (to put this into context: the average border county had 240 vacancies in 2009). Note, however, that the coefficients are estimated with low precision, such that only one of the post-treatment coefficients is statistically significant. In addition, the raw means in Panel (b) show diverging pre-trends in 2006-2008; in 2009-2012, the trend in border and matched control counties is, however, very similar.[24] In line with the trend for vacancies, Panel (d) of Figure C3 shows a strong decrease in log applicants per job, starting in 2013.

In addition to these event study results, I report regression coefficients from a standard difference-in-differences regression model on the county level in Table 4. These corroborate

[23] Figure D2 plots corresponding event study coefficients for a set of Czech municipalities, showing very similar trends.

[24] Most of the studies that investigate the effects of out-migration on labor markets focus on wages, which makes it difficult to compare these employment effects to those in the existing literature. Two exceptions are Elsner (2013a) and Škuflić and Vučković (2018), who find no or positive effects of worker outflows on unemployment rates in the context of European immigration. These studies investigate general out-migration and not cross-border commuting, which suggests that increased labor demand rather than decreased labor supply may play an important role in explaining my effects. Note that, unfortunately, the Czech Statistical Office data do not allow me to study wage adjustments on a fine-grained regional level.

the findings from the event study regressions, showing a statistically significant decline in unemployment rates, which is of similar size for men and women (see also Figure D3). Overall, unemployment rates declined by 6.45% compared to the average county unemployment rate in the border region in 2010.

In terms of vacancies, the diff-in-diff evidence again confirms the results of the event study regressions: relative vacancies increased by 170% relative to their value in 2009. At the same time, the number of applicants per job strongly decreased, by 10.7% compared to the pre-policy average. Figure D2 moreover shows that the pattern is even more pronounced when using municipality-level data.

In Table 4, I then investigate a variety of additional outcomes that could have been affected by the policy change: population inflows, the size of the population, and the age composition of the population. Neither of these change differentially following the labor market opening.

Overall, my results suggest that open positions due to the Czech commuter outflow were only partially filled by unemployed individuals or Czechs moving to the border region from other places. The policy change thus likely resulted in labor shortages and subsequent productivity constraints for local Czech firms.[25] It is possible that the increase in vacancies was a result not only of the negative labor supply shock but also of the positive demand shock due to increased consumption by Czech commuters. As Panels (a) and (b) of Figure 2 show, vacancies were increasing and unemployment rates were decreasing in both the border region and its controls, reflecting the overall positive economic situation in the Czech Republic in the 2010s. The coefficients from the event study analysis thus reflect the fact that in the border region, this process happened even quicker than in the rest of the country.

Selection of Czech Workers The decrease in unemployment rates in the Czech border region could be either due to unemployed individuals in the Czech Republic moving to Germany, or due to already employed individuals switching their jobs (with the vacant positions then being taken up by unemployed individuals).

[25] This is also supported by anecdotal evidence from German employment agencies that provide information to Czech workers about job opportunities in Germany. Reportedly, Czech firms in the border region requested a reduction in the frequency of such informational events in the late 2010s.

The selection of Czech commuters has different implications for wage and employment effects on the Czech side of the border: If Czech commuters were negatively selected, wages and employment in the border region should not change. If only the most productive workers emigrated, harming Czech firms' productivity, wages and employment may decrease.

Unfortunately, the missing wage data for the Czech Republic means that I cannot investigate this further. Yet Table 1 shows that the majority of Czechs working in Germany had at least some form of training (63% were reported to have vocational training, and 7.8% were reported to have a university degree). This does suggest that it was not the least productive workers who started commuting to Germany.

6.3 The Effect of In-Migration on Regions in West Germany

West German Municipalities Figure 3, Panels (a) and (b), shows the raw evolution of unemployment rates and log native full-time wages in the matched German municipalities. Panels (c) and (d) plot the corresponding event study coefficients from Equation 1.

Panel (c) shows that the border region had much higher unemployment rates in 2005 and 2006, when German unemployment was at a record high since reunification. From 2007, unemployment rates in border and control regions show largely similar trends, including in the post-opening period. If anything, unemployment rates in the border region were somewhat lower in 2012-2014, though not statistically significant. The raw means in Panel (a) show very similar unemployment rates in treated and control regions in the post-treatment period. In line with this result, as Panels (b) and (d) of Figure C4 show, native employment rates were similarly unaffected by the free movement policy.

Even though (native) employment in the border region was unaffected by the policy, it may have introduced downward pressure on native wages. Panels (b) and (d) of Figure 3 shows that this was not the case. Native full-time wages in the border region evolved very similarly to those in the matched controls, both pre and post 2011.

These null effects for native workers do not align with standard economic theory, which would predict a decrease in wages and possibly an increase in unemployment rates following a positive labor supply shock. One possible explanation is that Czech workers complemented native workers. Another is that labor demand was not saturated and remained highly elas-

tic. The German labor market in the 2010s was characterized by high tightness and labor shortages (e.g., Dustmann et al. (2025) and Figure E1). The inflow of migrant workers may thus have contributed to firm productivity, as in Beerli et al. (2021) and Clemens and Lewis (2022). As shown in Figure C6, Panel (d), vacancies in the German border region did not decrease after 2011; if anything, they began to rise around 2015.

East Germany Appendix Figure E6 presents baseline results for East German municipalities. The figure shows that the Czech worker inflow to East German regions was much lower, amounting to approximately 1ppt by 2017. After 2011, East German border regions experienced a long-term decline in unemployment rates (approximately 1ppt by 2017), and a corresponding noisy increase in employment rates. Native full-time wages decreased relative to matched control municipalities through 2013, and subsequently increased. Panels (e) and (f) of Figure E6 show that this was not due to changing import or export exposure; given the low increase in the number of Czech workers, it is however unlikely that these patterns are related to the migrant inflow. If anything, part of the decrease in the unemployment rate may be driven by German worker outflows to the Czech Republic, as documented in Figure 1.

Labor Market Effects by Demographic Group Studies such as Dustmann et al. (2017); Foged and Peri (2016); Ottaviano and Peri (2012) have shown that the labor market effects of labor supply shocks can vary greatly by demographic group, in particular by skill. Given the composition of Czech workers as described in Table 1, I would expect Czech workers to compete in particular with low- and medium-skilled natives and with men. It is thus possible that the null results presented for the whole region mask heterogeneity across worker groups. To investigate to what extent the commuter inflow affected groups of native workers differently, I estimate difference-in-differences regressions where I compute the main outcome variables - native unemployment (Panel a) and wages (Panel b) - by gender, skill groups, and age groups.

Column (1) of Table B10 presents estimates for native workers only, while column (2) includes outcomes for both natives and migrants. The coefficient on native unemployment

rates in Column (1) implies a small post-2011 decrease in unemployment rates for workers in the border region (-.72ppt), and a zero effect for native wages. The decrease in unemployment rates was driven by men (-.57ppt) and medium-skilled workers (-.43ppt), suggesting an increase in labor demand for these groups. No group faced an increase in the unemployment rate.

Panel B shows that the null result for native wages indeed masks some heterogeneity: male native workers' wages increased by 1.5% in the post-opening period. The wage increase is particularly large for low-skilled workers (4.4%). This result is in line with Foged and Peri (2016) who show that low-skilled natives may upgrade their positions in response to a migrant worker inflow.

Native Incumbent Workers in West Germany Finally, I examine a group of workers who may have been particularly affected by the worker inflow: native workers employed in the matched regions in 2010. Figure 4 presents event study coefficients for their labor market outcomes in the years before and after the policy change. To ensure valid comparisons, I include only similar workers matched based on demographics and labor market characteristics (see Section 5.3 for details on the matching algorithm). Figure 4 plots four worker-level outcomes: log earnings (Panel a), full-time log wages (Panel b), employment (Panel c), and days worked per year (Panel d).

Coefficients for both pre- and post-treatment years are close to zero and insignificant in most cases. Thus, Figure 4 aligns with the regional-level labor market effects, showing that incumbent workers were not negatively affected by the 2011 opening of the German labor market.

6.4 Trade and FDI Flows

The labor market opening may have affected trade and/or FDI between the Czech Republic and Germany. For example, increased interactions between German and Czech workers may have increased interactions between German and Czech firms (Burchardi et al., 2019).

To disentangle the migration effect from the potential trade/FDI effect, I proceed in the following steps: First, I match Czech and German regions based on information on the share

of German-owned firms/German firms with Czech affiliates in 2010 (for details on the data, see Schäffler (2014) and Appendix Section A1). In robustness checks, I moreover drop the regions with the highest share of German-owned firms in the Czech Republic, and German firms with Czech affiliates from the baseline sample (Tables 5 and 6). The baseline results do not change, suggesting that they are not driven by these firms.

Next, I want to ensure that my baseline results are not driven by differences in trade flows between the matched regions. Since I do not observe trade flows on the county level, I exploit information on a county's industry composition.

The Czech Republic For the Czech Republic, I have information on the share of firms by 1-digit industry. Table A1 presents coefficients on how the industry composition in the Czech border region changed after 2011. Reassuringly, the changes are minimal: the share of information technology firms decreased by 0.1

To ensure that differences in industry composition across treatment groups do not drive my results, I conduct the following robustness check: I reweight the border region to match control regions based on their industry composition in 2010 (see Section A3 for details). I then re-run the main analysis using these weights. Figure D4 presents the results, which closely resemble the baseline findings. One exception is Panel (c), which plots event study coefficients for vacancies. While it still shows an increase in vacancies, this effect is limited to the period from 2013 to 2015.

Germany For Germany, I have detailed information on industry composition. Combined with trade data for Germany provided by UN Comtrade (2024), I use this information to construct an indicator of import and export intensity for German municipalities with all countries that joined the EU in 2004 (EU10) and the Czech Republic. This approach follows the literature on trade and labor markets, particularly Dauth et al. (2014).

I then use these indicators as outcome variables in my baseline regression. Figure E5 presents the results: Reassuringly, both import and export exposure to the Czech Republic and the EU10 countries evolved similarly, supporting my argument that differential trade flows are not driving my baseline results.

7 Robustness Checks

I implement several robustness checks regarding the matching specification for both Germany and the Czech Republic. For the Czech Republic, Table 5 presents the results. Column (1) starts with the baseline analysis sample, while Column (2) reports results when restricting the sample to the border region with Bavaria. Column (3) further restricts the sample to the border region with Germany, and Columns (4)–(8) display coefficients using different matching specifications. Column (9) implements a placebo treatment test, and in Column (10), I exclude the two counties with the highest share of firms that are German subsidiaries.

Results for unemployment rates (Panel A), relative vacancies (Panel B), and log applicants per job (Panel C) remain robust. The scaled effects for unemployment rates range from -4.3% to -10.6%. Scaled effects for relative vacancies vary between 71% and 219%, but large standard errors mean that many of the coefficients are not statistically significant. Finally, scaled effects for log applicants per job range from -7.63% to -17.4%. Restricting the border region to Bavaria consistently produces the strongest effects, likely reflecting particularly good employment opportunities for Czech workers in that region.

For Germany, Table 6 reports the results for the baseline sample (Column 1), East Germany (Column 2), the narrow vs. wider border region (Column 3), several alternative matching algorithms (Columns 4–6), and alternative sample definitions (Columns 7–8). Across all specifications, I find either a zero effect or a post-2011 decrease in unemployment rates (Panel B). There is no effect on native wages in almost all specifications (Panel C), with one exception: using propensity score matching instead of Mahalanobis distance matching yields a statistically significant negative wage effect of 2.1%.

The total migrant worker inflow is positive in all specifications (Panel A), ranging from 0.32ppt in East Germany to 1.8ppt in the specification with additional matching variables (Column 6). When comparing municipalities in the narrow vs. wider border region, the coefficient on migrant shares loses significance, likely due to an equally strong migrant inflow to the wider border region. This suggests that the wider border region is not an ideal control group in this setting.

I present additional robustness checks in Appendix Section A4, including synthetic diff-

in-diff estimation, variations in sample definitions, and placebo treatment checks. Note that while these largely confirm robustness of my baseline results, there are some exceptions. For example, the synthetic diff-in-diff estimation suggests that the decrease in unemployment rates in the Czech Republic was statistically significant only in 2017.

8 Conclusion

This paper investigates the labor market effects of out-migration and in-migration in the Czech-German border region. I use a dynamic difference-in-differences analysis, exploiting the fact that many Czech workers started commuting across the joint border following the opening of the German labor market in 2011. A novel dataset on Czech regions allows me to investigate the labor market effects of the same immigration policy reform on both origin and destination country, simultaneously. The setting has the advantage that it features migration from an emerging economy to the largest economy in the EU, with large cross-country wage differentials.

I show that the integration of the two countries' labor markets resulted in a positive labor supply shock on the West German side of the border, with a 5ppt increase in the share of Czech workers by 2017. In the Czech border region, the size of the outflow corresponded to approximately 3% of the working age population by 2017. I conclude that the worker outflow from the Czech Republic led to a persistent decrease in unemployment rates, accompanied by an increase in vacancies and a decrease in applicants per job. For West Germany, I find no regional effects on unemployment, employment, and native full-time wages. If anything, wages of low-skilled workers increased, pointing to highly elastic labor demand. I ensure that these results are not confounded by differential developments in trade or FDI.

While existing studies typically treat the labor markets of the destination and origin countries as separate, considering both sides provides a more complete picture. I show that workers in the origin country consistently benefit, but concerns about brain drain and tighter labor markets due to emigration are valid. Conversely, my results indicate that under favorable economic conditions, incumbent native workers in destination countries do not need to fear displacement by migrant workers. If anything, they may benefit from positive productivity effects for firms. It is crucial for policymakers to be aware of these dynamics.

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Tables

Table 1: Native Worker vs. Czech Worker Characteristics

	(1) German Workers 2010		(2) Czech Workers 2012		(3) (2)-(1)	
	Mean	SD	Mean	SD	Difference	p-Value
Panel A: Earnings and Employment						
Total yearly earnings	19268.7	[15261.0]	16151.1	[12655.0]	**-3117.6**	1.4e-10
Daily Wage (EUR)	60.84	[40.43]	53.29	[33.10]	**-7.54**	4.6e-09
Full-time Daily Wage (EUR)	76.48	[36.37]	63.50	[29.43]	**-13.0**	4.6e-22
Days worked per year	270.1	[133.8]	268.8	[123.2]	-1.29	0.76
Panel B: Demographics						
Female	0.502	[0.500]	0.325	[0.469]	**-0.18**	9.4e-29
Age in years	41.33	[12.91]	39.09	[10.75]	**-2.24**	0.000000054
Share without vocational training	0.137	[0.344]	0.296	[0.457]	**0.16**	4.0e-47
Share with vocational training	0.752	[0.432]	0.627	[0.484]	**-0.13**	7.4e-20
Share with university degree	0.111	[0.314]	0.0777	[0.268]	**-0.033**	0.00099
Residency outside Germany	0.000523	[0.0229]	0.761	[0.427]	**0.76**	0
Manufacturing sector	0.440	[0.496]	0.481	[0.500]	**0.042**	0.0084
Service sector	0.538	[0.499]	0.496	[0.500]	**-0.042**	0.0089
Agriculture	0.0100	[0.0997]	0.00807	[0.0895]	-0.0020	0.53
Observations	145384		991			

Notes: This table presents the characteristics of native workers (Column 1, in 2010) and workers from the Czech Republic (Column 2, in 2012) in the German border region (both East and West) in the 10% worker sample of the German social-security data. Column (3) shows the difference in means and respective p-values from a t-test for equal means. Panel A shows how Czech and native workers differ in terms of earnings, log wages, and employment. Panel B shows how Czech and native workers differ with respect to demographics such as gender, age, and education. Residency outside Germany is a dummy indicating whether a worker is reported to 'live abroad' in the administrative data. I show the characteristics of Czech workers in 2012 because this is a year where a substantial number of them is already commuting across the border. In contrast, native workers' characteristics are reported in 2010, to ensure that they are not yet affected by the inflow. Differences in bold signal statistical significance at the 5%-level. The border region is defined as all municipalities located within 60-minute driving time to the next Czech-German border crossing.

Table 2: Summary Statistics of Czech Counties in 2010

(5)	(1)		(2)		(3)		(4)	
	All Counties		Non-Border Counties		Border Counties		(3)-(2)	
	Mean	SD	Mean	SD	Mean	SD	Difference	p-Value
Panel A: Employment								
Unemployment Rate	7.840	[2.070]	7.842	[1.844]	8.945	[1.916]	1.10	0.071
Number of Unemployed	7292.9	[4885.0]	8222.2	[5110.4]	6970.6	[2541.8]	-1251.7	0.33
Vacancies per Working Age Population	0.00379	[0.00175]	0.00388	[0.00157]	0.00374	[0.00157]	-0.00014	0.78
Number of applicants per job	26.13	[14.50]	24.40	[11.37]	30.17	[16.61]	5.77	0.21
Panel B: Firms								
Share Firms in Agriculture in %	0.0511	[0.0238]	0.0482	[0.0208]	0.0563	[0.0339]	0.0082	0.36
Share Firms in Manufacturing in %	0.139	[0.0229]	0.134	[0.0148]	0.126	[0.0193]	-0.0086	0.12
Share Firms in Construction in %	0.133	[0.0192]	0.131	[0.0163]	0.131	[0.0201]	-0.00046	0.94
Share German-Owned Firms	0.00138	[0.00141]	0.00120	[0.000893]	0.00255	[0.00209]	**0.0014**	0.011
Panel C: Population								
Working Age Population	95828.6	[100153.1]	98828	[47856.9]	76102.8	[24882.3]	-22725.2	0.067
Average age in region	40.66	[0.770]	40.72	[0.578]	40.18	[0.672]	**-0.54**	0.0097
Deaths	1387.6	[1396.4]	1465.9	[767.9]	1079.3	[358.9]	**-386.6**	0.048
Births	1521.5	[1672.4]	1532.5	[715.6]	1180.7	[427.4]	-351.8	0.067
Observations	77		20		20			

Notes: This table presents the characteristics of Czech counties in the year before the policy change. Column (1) presents all Czech counties, column (2) presents all matched non-border counties, column (3) presents all matched border counties, and column (4) shows the difference between non-border vs. border counties and respective p-values from a t-test for equal means. Counties are matched using mahalanobis distance matching. See Appendix A3.1 for a detailed description of the baseline mahalanobis distance matching algorithm. Border counties are all counties bordering either Germany or Austria. Differences in bold signal statistical significance at the 5%-level.

Table 3: Summary Statistics of West German Municipalities in 2010

	(1) All Regions		(2) Matched Controls		(3) Border Region		(4) (3)-(2)	
	Mean	SD	Mean	SD	Mean	SD	Difference	p-Value
Panel A: Employment								
Native Mean (levels))	3052.3	[18462.2]	2532.3	[5280.2]	2002.8	[4531.8]	-529.5	0.24
Share Migrant Workers	0.0511	[0.0512]	0.0361	[0.0189]	0.0284	[0.0168]	**-0.0077**	0.0000040
Share Migrant Workers from EU	0.0238	[0.0341]	0.0139	[0.00881]	0.0186	[0.0149]	**0.0048**	0.000031
Share Full-time Workers	0.470	[0.145]	0.513	[0.0863]	0.528	[0.0920]	0.015	0.065
Panel B: Daily Wages (EUR)								
Native Average Wages	65.64	[11.70]	67.24	[4.766]	65.06	[4.987]	**-2.18**	0.0000018
Mean Wages	64.79	[11.24]	66.65	[4.676]	64.64	[4.931]	**-2.01**	0.0000080
Panel C: Workforce Characteristics								
Share Workers Aged 15-29	0.173	[0.0655]	0.187	[0.0329]	0.188	[0.0358]	0.00096	0.76
Share Workers Aged 30-49	0.470	[0.0840]	0.485	[0.0259]	0.486	[0.0304]	0.0012	0.65
Share Female Workers	0.480	[0.127]	0.493	[0.0846]	0.492	[0.0931]	-0.00051	0.95
Share High-skilled Workers	0.0626	[0.0519]	0.0495	[0.0198]	0.0432	[0.0222]	**-0.0063**	0.0013
Share Medium-skilled Workers	0.758	[0.0845]	0.793	[0.0339]	0.807	[0.0371]	**0.014**	0.000038
Share Low-skilled Workers	0.148	[0.0632]	0.139	[0.0259]	0.137	[0.0304]	-0.0014	0.59
Panel D: Other Characteristics								
Share FDI Firms	0.00280	[0.00672]	0.00514	[0.00623]	0.00868	[0.0102]	**0.0035**	0.0000071
Import Exposure (in 1000 EUR)	24.42	[68.40]	19.62	[15.86]	20.07	[18.73]	0.45	0.78
Export Exposure (in 1000 EUR)	21.48	[67.08]	17.81	[14.90]	18.27	[15.90]	0.46	0.75
Distance to CZ Border (km)	293.1	[120.2]	205.2	[109.5]	28.28	[14.74]	**-176.9**	9.9e-86
Observations	8365		234		234			

Notes: This table presents the characteristics of West German municipalities in the year before the policy change. Column (1) presents all German municipalities, Column (2) presents all matched non-border municipalities, Column (3) presents all matched border municipalities, and Column (4) shows the difference between non-border vs. border municipalities and respective p-values from a t-test for equal means. Municipalities are matched using mahalanobis distance matching, separately within East vs. West Germany. See Appendix A3.1 for a detailed description of the baseline mahalanobis distance matching algorithm. High-skilled workers have a university degree, medium-skilled workers have completed vocational training, low-skilled workers have no vocational training. FDI establishments are German establishments with affiliates in the Czech Republic. Import and export exposure are measured in 1000 EUR per worker. Treated municipalities are all municipalities located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. Differences in bold signal statistical significance at the 5%-level.

Table 4: Difference-in-Differences Estimates for County Outcomes - Czech Republic

	(1)	(2)	(3)	(4)
Panel A:	Unemployment Rate (UR)	UR Men	UR Women	Log Unemployed
Diff-in-Diff	-0.0058	-0.0063	-0.0052	-0.098
	(0.0026)**	(0.0028)**	(0.0027)*	(0.047)**
Observations	560	560	560	560
Dep. Var Mean in BR in 2010	0.089	0.092	0.087	8.77
Scaled Effect (% of Mean)	-6.45	-6.86	-5.99	-1.12
County FE	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes
Panel B:	Relative Vacancies	Log Applicants per Job	Log Vacancies f. Youth	Inflows
Diff-in-Diff	1.70	-0.35	0.41	-7.20
	(0.73)**	(0.10)***	(0.23)*	(84.6)
Observations	560	510	552	560
Dep. Var Mean in BR in 2010	1.23	3.24	3.35	1411.7
Scaled Effect (% of Mean)	137.7	-10.7	12.2	-0.51
County FE	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes
Panel C:	Total Population	Aged 0-14	Aged 15-64	Aged 65+
Diff-in-Diff	-405.7	-611.0	648.2	-442.8
	(1354.4)	(366.1)	(1276.0)	(454.0)
Observations	480	480	480	480
Dep. Var Mean in BR in 2010	107557.6	16053.8	76102.8	15401.0
Scaled Effect (% of Mean)	-0.38	-3.81	0.85	-2.88
County FE	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes

Notes: This table shows how a number of regional characteristics in the Czech border region changed following the outflow of Czech workers. It presents coefficients from a difference-in-differences regression with matched pair id × year and county fixed effects and standard errors clustered at the county level. Diff-in-Diff reports the coefficient on the interaction of a dummy for being located in the border region with a dummy for all years from 2011. Panel A reports results for different unemployment outcomes. Panel B reports results for different vacancy outcomes. Note that while 'vacancies' in Column (1) contains all vacancies as reported on December 31 in a given year, 'vacancies for youth' in Column (3) reports the number of vacancies reported specifically for young people or recent graduates. 'Inflows' in Column (4) reports the number of individuals of all ages who moved to a given region in a given year. Panel C reports results for different population size outcomes. *, ** and *** correspond to 10, 5 and 1 percent significance levels, respectively.

Table 5: Robustness Checks - Czech Republic

	(1) Baseline	(2) BR to Bavaria	(3) BR to Germany	(4) Propensity Score	(5) Adding Industry	(6) Matching on Ind. Comp.	(7) Matching on 2008	(8) Matching on Crime Vars.	(9) Placebo Treatment	(10) Exclude High FDI
Panel A: Unemployment Rate										
Diff-in-Diff	-0.58	-0.83	-0.88	-0.57	-0.47	-0.38	-0.51	-0.53	-0.055	-0.48
	(0.26)**	(0.55)	(0.29)***	(0.24)**	(0.21)**	(0.21)*	(0.23)**	(0.16)***	(0.34)	(0.27)*
Observations	560	140	392	560	560	560	560	560	240	504
Dep. Var Mean in BR in 2010	8.94	7.78	9.11	8.94	8.94	8.94	8.94	8.94	7.24	8.96
Scaled Effect (% of Mean)	-6.45	-10.6	-9.71	-6.33	-5.29	-4.30	-5.68	-5.91	-0.77	-5.38
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Relative Vacancies										
Diff-in-Diff	1.70	3.24	1.72	1.63	1.06	0.87	1.13	1.27	-0.13	1.02
	(0.73)**	(2.08)	(0.87)*	(0.80)**	(0.84)	(0.85)	(0.86)	(0.76)	(0.12)	(0.57)*
Observations	560	140	392	560	560	560	560	560	240	504
Dep. Var Mean in BR in 2010	1.23	1.48	1.28	1.23	1.23	1.23	1.23	1.23	2.00	1.14
Scaled Effect (% of Mean)	137.7	218.8	134.6	132.3	86.2	70.7	91.7	103.1	-6.43	89.4
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Log Applicants per Job										
Diff-in-Diff	-0.35	-0.48	-0.37	-0.37	-0.26	-0.25	-0.25	-0.35	0.013	-0.32
	(0.10)***	(0.094)***	(0.13)**	(0.11)***	(0.089)***	(0.12)**	(0.11)**	(0.092)***	(0.12)	(0.11)***
Observations	510	118	356	496	512	510	516	506	232	462
Dep. Var Mean in BR in 2010	3.24	2.74	3.13	3.24	3.24	3.24	3.24	3.24	1.86	3.28
Scaled Effect (% of Mean)	-10.7	-17.4	-11.7	-11.5	-8.16	-7.74	-7.63	-10.9	0.72	-9.81
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each column in this table represents a different robustness check for different samples of Czech counties. Each column presents coefficients from a difference-in-differences regression with matched pair id × year and county fixed effects and standard errors clustered at the county level. Diff-in-Diff reports the coefficient on the interaction of a dummy for being located in the border region with a dummy for all years from 2011. Column (1) reports the baseline coefficients. Column (2) reports coefficients for a matching specification with treatment counties bordering West Germany (i.e. Bavaria), only. Column (3) reports coefficients for a matching specification with treatment counties bordering Germany, only. Column (4) reports coefficients for a sample of regions that is matched via propensity score matching, where the following variables enter the probit regression to compute propensity scores: The share of the working age population, the share of firms in manufacturing, the share of firms in agriculture, unemployment rate, number of vacancies, population size, number of applicants per job, average age, and the number of individuals receiving benefits (all measured in 2010). Column (5) reports coefficients when adding the share of firms in a given 1-digit industry (all measured in 2010) to the set of mahalanobis matching variables. Column (6) reports coefficients when only matching on the share of firms in a given 1-digit industry. Column (7) reports results with baseline mahalanobis matching variables measured in 2008 instead of 2010. Column (8) reports coefficients when adding deciles of figures for all crimes, robbery, and burglary (all measured in 2010) to the set of mahalanobis matching variables. Column (9) reports results from a placebo regression for 2005-2010 where the placebo treatment is assigned to the year 2007. Column (10) reports results when excluding the two counties with top shares of German-owned firms in 2010 from the sample. These are Tachov and Domažlice (shares of .6% and .8%, respectively). In Panel B, the outcome is vacancies relative to vacancies in 2009. For the placebo regression in column (9), the dependent variable mean is reported for 2006, and relative vacancies are computed relative to 2005. See Appendix A3.1 for a detailed description of the baseline mahalanobis distance matching algorithm. *, ** and *** correspond to 10, 5 and 1 percent significance levels, respectively.

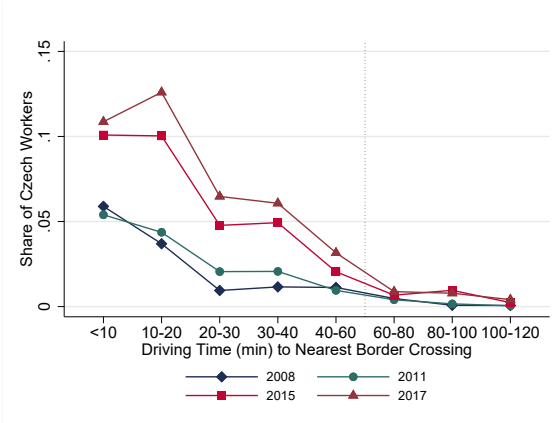
Table 6: Robustness Checks - West Germany

	(1) Baseline	(2) East Germany	(3) Narrow vs. Wider BR	(4) Propensity Score Matching	(5) Matching in 2008	(6) Add. Matching Var.	(7) Exclude FDI Firms	(8) Exclude Same Comm. Zone
Panel A: Migrant Worker Share								
Diff-in-Diff	0.013	0.0032	0.0072	0.016	0.012	0.018	0.011	0.0082
	(0.0056)**	(0.0016)**	(0.0059)	(0.0072)**	(0.0052)**	(0.0063)***	(0.0056)**	(0.0060)
Observations	5148	3586	5940	5568	5390	3806	5148	5126
Dep. Var Mean in BR in 2010	0.034	0.0064	0.039	0.041	0.035	0.035	0.034	0.034
Scaled Effect (% of Mean)	37.6	49.7	18.3	40.3	34.4	51.5	32.9	23.9
Muni. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bartik Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Unemployment Rate								
Diff-in-Diff	-0.0070	-0.0040	-0.0011	-0.013	-0.0068	-0.011	-0.0099	-0.0056
	(0.0029)**	(0.0039)	(0.0041)	(0.0046)***	(0.0028)**	(0.0033)***	(0.020)	(0.0030)*
Observations	5148	3586	5947	5594	5400	3806	5148	5126
Dep. Var Mean in BR in 2010	0.096	0.16	0.10	0.10	0.097	0.092	1	0.096
Scaled Effect (% of Mean)	-7.35	-2.57	-1.05	-12.3	-6.97	-11.8	-0.99	-5.79
Muni. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bartik Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Native Log Full-time Wages								
Diff-in-Diff	0.0022	-0.0041	-0.012	-0.021	0.0029	0.0073	0.0036	-0.0030
	(0.0068)	(0.0051)	(0.0075)	(0.0088)**	(0.0062)	(0.0078)	(0.0071)	(0.0067)
Observations	5148	3586	5927	5506	5398	3804	5148	5126
Dep. Var Mean in BR in 2010	4.35	4.12	4.34	4.34	4.35	4.37	4.33	4.35
Scaled Effect (% of Mean)	0.051	-0.100	-0.28	-0.47	0.066	0.17	0.084	-0.069
Muni. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bartik Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

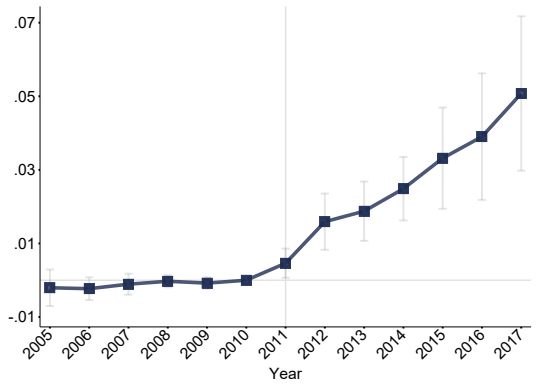
Notes: Each column in this table represents a different robustness check for different samples of German municipalities. Each column presents coefficients from a difference-in-differences regression with year and municipality fixed effects and standard errors clustered at the municipality level. Diff-in-Diff reports the coefficient on the interaction of a dummy for being located in the border region with a dummy for all years from 2011. Column (1) reports the baseline coefficients for West Germany. Column (2) reports the corresponding coefficients for East Germany. Column (3) reports coefficients for the wider vs. narrow border region. I define the narrow border region as all municipalities that are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The wider border region comprises all municipalities that are located within a 60-120-minute driving distance from the nearest road border crossing. Column (4) reports coefficients for a sample of municipalities matched via propensity score matching instead of mahalanobis distance matching. The matching variables remain the same. Column (5) reports coefficients when measuring the constant matching variables in 2008 instead of 2010. Column (6) reports coefficients when, in addition to the baseline matching algorithm, matching exactly on regional type (5 types: i) large city, ii) medium-sized city, iii) larger town, iv) smaller town, v) rural municipality). Three additional industry shares enter the list of matching variables: Share of firms in mining, the electric industry, and construction. Column (7) reports results when excluding German firms with an affiliate in the Czech Republic from the sample. Column (8) reports results from a sample where the control units are restricted to always lie outside the commuting zones of treated units. See Appendix A3.1 for a detailed description of the baseline mahalanobis distance matching algorithm. I match within West/East Germany, and I drop control municipalities located less than 80km from the German-Polish border. I restrict the sample to 2007-2017. *, ** and *** correspond to 10, 5 and 1 percent significance levels, respectively.

Figures

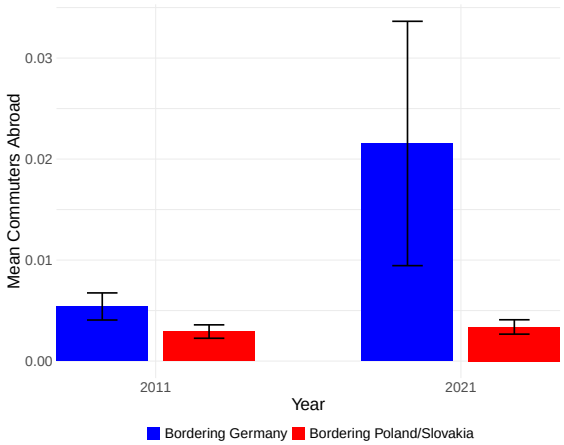
Figure 1: Migration Flows across the Czech-German Border



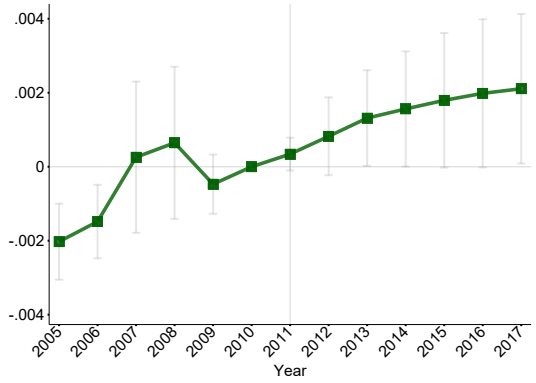
(a) Czech Worker Share in West Germany



(b) Czech Worker Share in West Germany



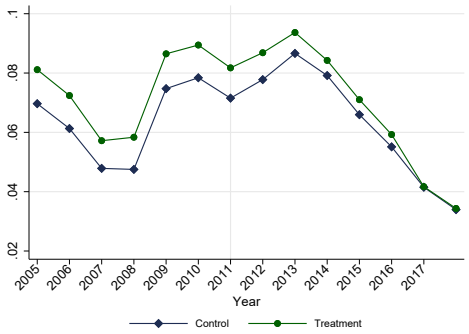
(c) Czechs Commuting Abroad 2011 vs. 2021



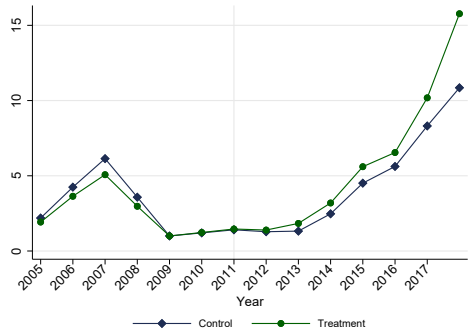
(d) German Resident Share in the Czech Republic

Notes: This figure describes migration flows on both sides of the Czech-German border. Panels (a) and (b) show the inflow of Czech workers to the West German border region. Panel (c) shows the 2011-2021 increase in Czech citizens who commute abroad by type of region, and Panel (d) shows the increase of residents with German citizenship in the Czech border region. Panel (a) descriptively plots the share of Czech workers by driving time (in mins) to the nearest Czech-German road border crossing for 4 points in time: 2008 (blue diamonds), 2011 (green circles), 2015 (red squares), and 2017 (darkred triangles). Panel (b) reports event study coefficients on the differential inflow of Czech workers to border municipalities, relative to employment in 2010. The regression includes a Bartik-style employment control. Panel (c) provides a descriptive plot of the number of Czech citizens commuting abroad as a share of the total population in 2011 and 2021, based on data from the Czech Population Census for administrative districts. Jihočeský kraj, Karlovarský kraj, Plzeňský kraj, and Ústecký kraj are regions bordering Germany, and Královéhradecký kraj, Moravskoslezský kraj, Olomoucký kraj, Pardubický kraj and Zlínský kraj are regions bordering Poland or Slovakia. Panel (d) reports event study coefficients on the differential inflow of German residents to treated vs. control counties in the Czech Republic. Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. The Czech border region includes all counties that share a direct border with Germany or Austria. Treated municipalities in Germany are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The German labor market opened for EU8 workers in 2011.

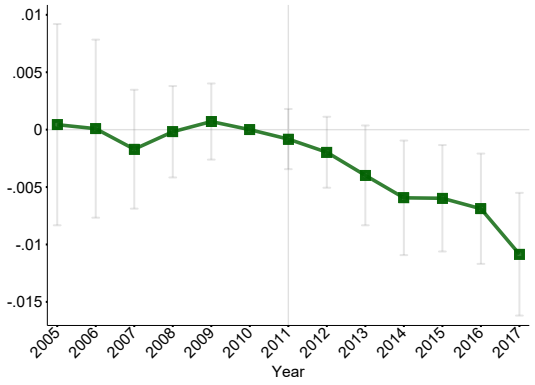
Figure 2: The Impact of Out-Migration on Local Labor Markets in the Czech Republic



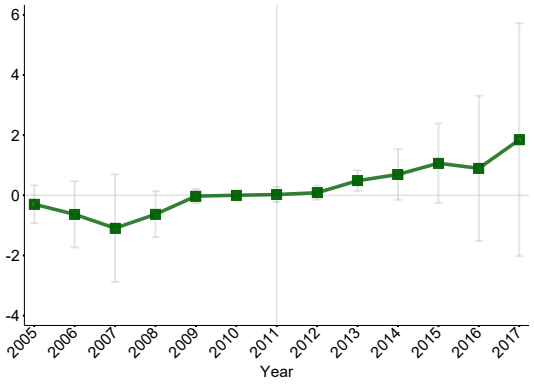
(a) Unemployment Rates - Raw Means



(b) Relative Vacancies - Raw Means



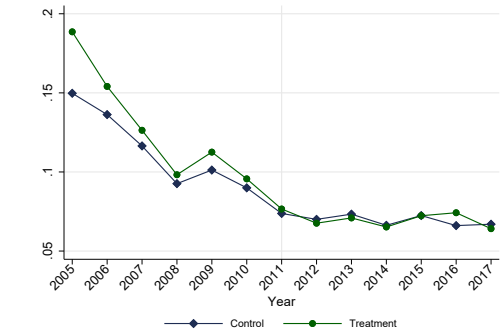
(c) Unemployment Rates - Event Study



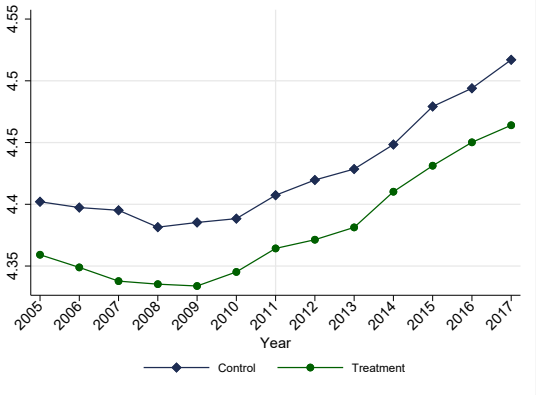
(d) Relative Vacancies - Event Study

Notes: This figure shows outcomes for Czech border counties compared to matched control counties. Panels (a) and (b) plot raw averages for unemployment rates and vacancies relative to vacancies in 2009, respectively. Panels (c) and (d) report the corresponding event study coefficients. All outcomes are recorded on December 31 in a given year. Event study regressions include pair id × year and county fixed effects. Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. The border region includes all counties that share a direct border with Germany or Austria. The German labor market opened for Czech workers in 2011.

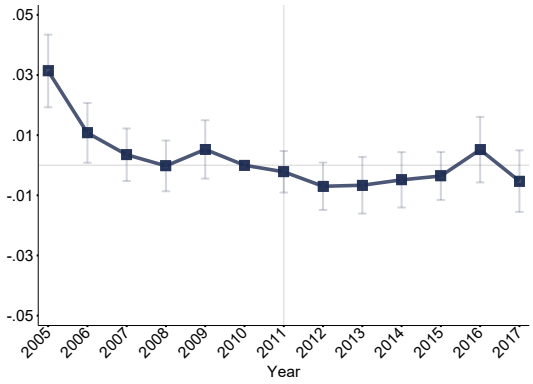
Figure 3: The Impact of In-Migration on Local Labor Markets in West Germany



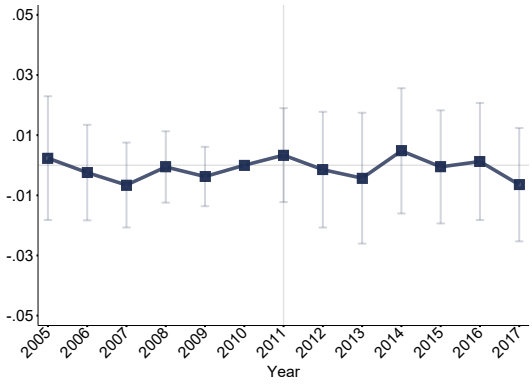
(a) Unemployment Rates - Raw Means



(b) Log Native Full-time Wages - Raw Means



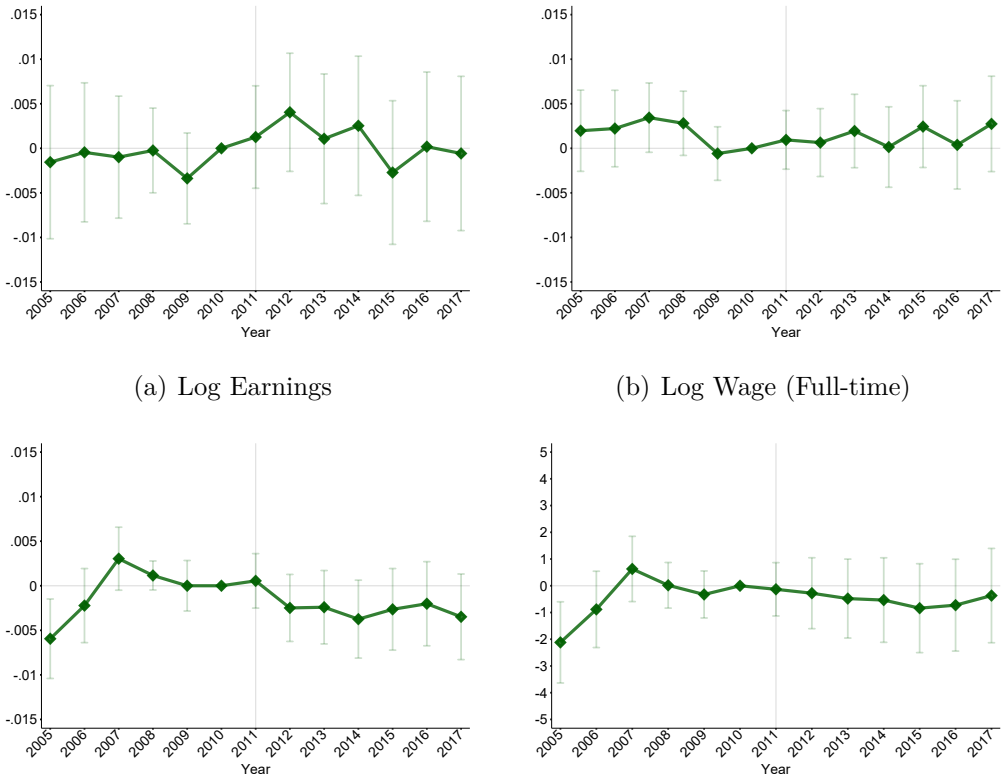
(c) Unemployment Rates - Event Study



(d) Log Native Full-time Wages - Event Study

Notes: This figure shows outcomes for West German border municipalities compared to matched control municipalities. Panels (a) and (b) plot raw averages for unemployment rates and native employment by employment in 2010, respectively. Panels (c) and (d) plot the corresponding event study coefficients. Event study regressions include pair id × year and municipality fixed effects, and Bartik controls (see Appendix Section A1.3 for details). The gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. Treated municipalities are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The German labor market opened to EU8 workers in 2011.

Figure 4: Labor Market Outcomes for Cohort of Matched Native Workers in West Germany



(a) Log Earnings

(b) Log Wage (Full-time)

(c) Employment

(d) Days Worked per Year

Notes: This figure reports labor market outcomes for a cohort of native workers who were employed in the matched regions in West Germany in 2010. Within these regions, I use a combination of exact matching and mahalanobis distance matching to find unique matched worker pairs. I match workers exactly within cells of gender, 1-digit industry, 1-digit occupation, and a dummy for whether they work at a German firm with an affiliate in the Czech Republic. Within these cells, I use mahalanobis distance matching to find unique matches based on age (2010), experience (2010), education (2010), full-time job status (2010, 2008). Days worked refer to social-security employment (excluding minijobs). Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level.

Online Appendix

List of Tables

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A1 Data Appendix

A1.1 Import and Export Exposure in Germany

Since trade data are not available on the regional level, I follow Dauth et al. (2014) and construct a measure for import and export intensity that is based on the regional industry composition. For this purpose, I first obtain data on imports and exports between Germany and the Czech Republic/the countries that entered the EU in 2004 (EU10)[26] from the UN Comtrade (2024) database. These data exist on a 3-digit industry level. I use the code provided by Dauth et al. (2014) to map the SITC codes used by UN Comtrade (2024) to the industry codes in the IAB data (industry variable *wz73*).

I next convert values into EUR based on yearly exchange rates provided by U.S. Internal Revenue Service (IRS). I then deflate the values using a consumer price index provided by the German Statistical Office with reference year 2010.

In a next step, I construct two measures for import and export exposure, again following Dauth et al. (2014). I construct import exposure as follows:

$$Import\,exp._{it}^{EU10} = \sum_{j} \frac{E_{ijt}}{E_{jt}} \frac{Im_{jt}^{D \leftarrow EU10}}{E_{it}} \tag{A1}$$

where $Im_{jt}^{D \leftarrow EU10}$ are German imports from EU10 countries in industry j at time t, which I divide by total county employment in year t, E_{it}. $\frac{E_{ijt}}{E_{jt}}$ denotes a county i's share of national industry employment in industry j and year t.

I construct a region's export exposure analogously as:

$$Export\,exp._{it}^{EU10} = \sum_{j} \frac{E_{ijt}}{E_{jt}} \frac{Ex_{jt}^{D \rightarrow EU10}}{E_{it}} \tag{A2}$$

where $Ex_{jt}^{D \rightarrow EU10}$ represents German exports to EU10 countries in industry j at time t, again normalized by total county employment and weighted by the county's share of national industry employment.

[26] The full list of countries is Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia.

A1.2 Czech Data

Czech Population Census The commuting data presented in Figure 1, Panel (c), comes from information collected every ten years by the Czech Population Census and provided by the Czech Statistical Office. The data for the 2021 census was collected online, with 86% of the population participating.

Data on the Czech Worker Outflow Figure D1 combines (i) Czech data on emigration to other countries, (ii) Czech data on the working age population and (iii) German data on commuter figures. Given this combination of data, it comes with some important caveats. The Czech data on emigration stems from de-registrations and does not comprise commuters, meaning that it is likely an under-estimation of true out-migration rates.

It is, however, highly unlikely that there were large worker outflows from the Czech control regions following 2011. All European countries except Germany and Austria opened their labor markets to Czech workers prior to 2011, so such outflows should have occurred much earlier. In fact, according to data from Eurostat (2020), the share of Czechs leaving their country fell from 0.6% in 2009 to just above 0.2% in 2013.

To account for commuter figures, I made the assumption that Czechs would predominantly commute to adjacent counties in Germany. I therefore assigned a given Czech border county the number of commuters in its "German twin" on the other side of the border. I then added the number of emigrants to Germany to this figure. Under the assumption that emigration rates are similarly biased for border and control counties, and assuming there were few out-commuters from control counties, the pattern in the figure should come close to the true difference.

A1.3 German Data

Data on German Firms with Affiliates in the Czech Republic The data on German firms with affiliates in the Czech Republic comes from the *ReLOC* firm database provided by the IAB (Schäffler, 2014). It provides information on German firms with a Czech affiliate through 2010. It consists of 3406 German firms in total.

The data base combines information from the Czech business register on Czech firms with German subsidiaries with names and addresses of firms in Germany. Via a record linkage process and through a unique identifier, the respective firms can then be linked to the administrative establishment data at the IAB. This data has been used in a variety of research projects analyzing FDI in both countries (e.g., Münich et al. (2014), Hecht (2017), Körner et al. (2021)).

In addition, the data base contains information on the county-level location of Czech subsidiaries in the Czech Republic. I use this information to construct regional shares of German-owned firms in the Czech Republic, and of German firms with Czech affiliates in Germany.

Unemployment rates Since no harmonized data on unemployment rates on the municipality level is publicly available, I construct unemployment rates myself using a 10% sample of the German administrative employee data. This data comprises employed and unemployed individuals.

For this purpose, I proceed as follows: Using the code povided by Dauth and Eppelsheimer (2020), I construct a yearly panel based on information on June 30 each year. If an individual has several spells on June 30, I keep the spell with the higher wage. If an individual is unemployed and has a minijob (marginal employment that is exempt from social-security contributions), I count them as unemployed.

I construct unemployment rates as follows:

$$UR_{it} = \frac{\sum UE_{it}}{E_{it} + UE_{it}} \tag{A3}$$

i.e., the unemployment rate corresponds to the number of unemployed individuals in a given county i and year t, divided by the sum of unemployed and employed individuals in that county i and year t.

Bartik control For part of my analysis, I use Bartik-style employment and wage controls to control for industry-driven local demand shocks. For the construction, I follow Beerli et al. (2021) and construct the Bartik-style employment indicator as follows:

$$\widetilde{EMP}_{i,t} = \sum_{j=1}^{17} \left(EMP_{i,j,2003} \frac{EMP_{-i,j,t}}{EMP_{-i,j,2003}} \right) \tag{A4}$$

where $EMP_{i,j,2003}$ is employment in a given county i and 1-digit industry j in 2003, the last year before the EU enlargement. $\frac{EMP_{-i,j,t}}{EMP_{-i,j,2003}}$ indicates the ratio of employment in t to employment in 2003, excluding the county i. I control for the Bartik employment indicator in regression equations analyzing employment outcomes, including migrant shares, unemployment rates, and employment rates.

The Bartik-style wage control is constructed analogously:

$$\widetilde{w_{i,t}} = \sum_{j=1}^{17} s_{i,j,2004} \left(w_{i,j,2003} \frac{w_{-i,j,t}}{w_{-i,j,2003}} \right) \tag{A5}$$

where $w_{i,j,2003}$ refers to log wages in a given county i and 1-digit industry j in 2003. $\frac{w_{-i,j,t}}{w_{-i,j,2003}}$ indicates the ratio of wages in t to wages in 2003, excluding the county i. $s_{i,j,2004}$ is each industry's employment share in a given county i in 2004. I control for this Bartik wage indicator in regression equations where the outcome variable is native wages.

A2 Descriptive Patterns

A2.1 Access to the German Labor Market for Czech Workers Prior to 2011

Czechs first started to work in Germany after the fall of the iron curtain in the beginning of the 1990s (Dustmann et al., 2017; Moritz, 2011). They were allowed to work in Germany under the so-called *Anwerbestoppausnahmeverordnung*, a regulation that allowed specific groups of workers to take up employment, despite a more general ban on immigration. Czech workers were able to take up work in specified counties in the German border region, as long as they i) commuted across the border daily, or ii) worked in Germany not more than 2 days a week. This regulation was valid with minor modifications up to 2011, when it was repealed altogether. This is the reason why the share of Czech workers prior to the reform was not 0, but stayed relatively constant at around 1% (cf. Figure E4).

The opening of the German labor market under the free-movement-policy in 2011 resulted in two key changes: First, Czech workers could now work in Germany without needing a

visa or work permit, significantly reducing the bureaucratic burden and thus costs for both firms and workers. Second, the principle of prioritizing native workers was lifted, meaning that firms no longer had to demonstrate that there were no suitable native workers available for the job. According to Seibert and Wiethölter (2020), this policy change led to a tripling of cross-border commuters in Germany between 2011-2019, with Czech workers comprising the third-largest origin group.

Figure D1, Panels (c) and (d), uses aggregate statistics provided by the German Federal Employment Agency on the number of Czech cross-border commuters to show how the number of Czech cross-border commuters increased in levels (Panel c) and as a share of the working age population (Panel d). It shows that the number of Czech commuters in the German border region almost tripled between 2010-2022, with the working age population share increasing from about 0.25% in 2010 to 1.25% in 2021.

It is possible that Czech or EU8 workers worked in the informal sector prior to 2011, in which case the migrant inflows I measure may partially reflect a shift from non-formal to formal employment.[27] In that scenario, Figure 1 should exhibit a substantial increase in the share of Czech workers when the reform was implemented, between 2010 and 2011. The increase between 2010 and 2011 is, however, marginal. In a robustness check (Figure E12), I moreover show that my worker-level results are robust to dropping the three sectors that are most susceptible to informal work (construction, services for private households and car repair).

A2.2 EU8 and German Workers

Table B4 presents summary statistics for native and EU8 workers in the German border region. Similar to Table 1 for a comparison with native and Czech workers, it shows that EU8 workers' yearly earnings are substantially lower. This is both due to lower wages (-6 EUR/day) and fewer days worked per year (-15). Most EU8 workers are men, and the marjority of them is medium-skilled (58%).

In Table B6, I provide additional evidence on the industries in which EU8 migrants

[27] According to a study by Schneider and Boockmann (2022), Germany ranks low in estimates of its shadow economy relative to GDP: In 2022, it placed 7th, behind the US and Switzerland but with a smaller share than Canada, Norway, or France.

work in compared to natives. The table shows the share of EU8/native workers in a given industry relative to overall EU8/native employment. EU8 workers are clearly overrepresented in industries such as production goods, restaurants, and construction. In turn, they are underrepresented in sectors such as public administration and education. As Table B5 shows, EU8 workers are even more concentrated in certain occupations. Their employment share is particularly large in machine operations and maintenance, and food and cleaning.

Finally, Table B7 provides an intuition on the establishments where EU8 migrants work at compared to natives. Panel A shows that they work in establishments with a lower share of high-skilled workers and a higher-share of marginally employed workers. In Panel B, we see that they also work for establishments that pay lower average wages (73 vs. 80 EUR). They are equally likely as Germans to work in a firm that has an affiliate in the Czech Republic.

A3 Matching and Reweighting

A3.1 Mahalanobis Distance Matching of Regions

For my baseline analysis, I match German municipalities and Czech counties using exact matching combined with mahalanobis distance matching. I use the stata command *kmatch* provided by Jann (2017). Note that since the labor market variables available differ by country, I cannot use the exact same matching algorithm for both Germany and the Czech Republic.

Mahalanobis distance matching computes the distance between two observations, e.g., a treatment region X_t and its potential control regions X_c, and then assigns the control region with the smallest distance. The mahalanobis distance is computed as follows: $M(X_t, X_c) = \sqrt{(X_t - X_c)' S^{-1} (X_t - X_c)}$ where S corresponds to the sample covariance of X (King et al., 2011).

The Czech Republic For the Czech Republic, I use county-level data provided by the Czech Statistical Office to match border counties to suitable controls using mahalanobis distance matching (without replacement). The following variables enter the matching algorithm

(all measured in 2010):

- The share of the working age population (individuals aged 15-64) by the total population in a given county.
- The logarithm of the total population in a given county.
- The number of unemployed individuals relative to the full population in a given county.
- The logarithm of available vacancies.
- The share of firms in manufacturing by all firms in the county (where the number of manufacturing firms is pre-computed by the Czech Statistical Office).
- The share of firms in agriculture by all firms in the county (where the number of firms in agriculture is pre-computed by the Czech Statistical Office).
- The share of firms with 1-49 employees.
- The share of German-owned firms (quartiles) according to the ReLOC data provided by Schäffler (2014).

Germany For Germany, the variables used in the matching are provided by the IAB in the *Establishment History Panel (BHP7519)*, which is a firm-level dataset that I aggregate to the municipality level. I match within cells of East and West Germany. From the pool of potential controls, I drop municipalities located less than 80km from the German-Polish border, since they could be subject to increased immigration from Poland. To improve the quality of the matching, I drop treatment-control pairs with a mahalanobis distance greater than 2. I then use the following variables to minimize the mahalanobis distance between treated and control municipalities without replacement (unless indicated otherwise, all variables are measured in 2010):

- The share of workers aged 15-29, and the share of workers aged 30-49, where the shares are computed as the number of workers in the respective age range and municipality by total employment in the municipality.

- The share of low-skilled workers (workers without vocational training) and the share of medium-skilled workers (workers with vocational training), relative to total municipality employment.
- The share of female workers and the share of migrant workers by total municipality employment.
- The share of firms in the service sector by the total number of firms in a given municipality. I define the service sector as industries in wholesale trade, hospitality, transport, finance, real estate, public administration, education, and an additional category for "other services" (including, e.g., accountants or architects).
- The share of firms in the manufacturing sector by the total number of firms in a given municipality. I define the manufacturing sector as industries focused on the processing of food, textiles/leather, wood , paper, coke, chemicals, rubber, non-metallic products, basic metal, machinery, electronics, transport goods, and other goods such as furniture, instruments or toys.
- The share of firms in agriculture.
- The growth in EU workers' employment as a share of total employment in a given municipality from 2004 to 2010.
- Employment growth in 2008-2010.
- Log wages, where the wage corresponds to the average across mean establishment wages in a given municipality, deflated with base year 2010.
- Export exposure to EU10 countries.
- The share of firms with a Czech affiliate (quartiles) according to the ReLOC data provided by Schäffler (2014).

A3.2 Worker-Level Matching for Germany

For an additional analysis, I match incumbent workers in Germany; these are workers who were employed in the treated and control municipalities on June 30 in 2010. I use a combination of exact matching with mahalanobis distance matching to find matched worker pairs. I match workers exactly using gender, East/West Germany, working at a firm with a Czech affiliate as defined by Schäffler (2014), 1-digit industries[28], and 2-digit occupations[29]. I then minimize the distance between worker pairs based on the following variables (all measured in 2010 if not indicated otherwise):

- Age in years.
- Work experience in Germany in years, which sums up the duration of all of a worker's employment spells that are part of the social-security data.
- Years of education.
- A dummy indicating whether a worker was employed in a full-time job (measured both in 2008 and 2010).

[28]These are: (i) Agriculture, (ii) mining and energy, (iii) food, (iv) consumption goods, (v) production goods, (vi) investment goods, (vii) construction, (viii) retail, (ix) traffic, telecommunication, (x) credit, insurance, (xi) restaurants, (xii) education, (xiii) health, (xiv) commercial services, (xv) other services, (xvi) non-profit, (xvii) public adminsitration.

[29]These follow a definition by the German Federal Institute for Vocational Education and Training and comprise the following: These are: (i) Agriculture, animal husbandry, forestry, horticulture, (ii) Miners, mineral extractors, (iii) Stone processing, building materials production, ceramics, glass professions, (iv) Chemical, plastics professions, (v) Paper manufacturing, -processing, -printing, (vi) Metal production, -processing, (vii) Metal-, plant engineering, sheet metal construction, installation, assemblers, (viii) Industrial-, tool mechanic, (ix) Driving-, aircraft construction, maintenance professions, (x) Precision engineering, related professions, (xi) Electrical Professions, (xii) Textile processing, leather production, (xiii) Chefs, (xiv) Beverages, luxury food production, other food professions, (xv) Building trades, wood, plastics processing and machining, (xvi) Unskilled laborer, (xvii) Engineer, (xviii) Chemists, physicists, natural scientists, (xix) Technicians, (xx) Technical draftsmen and draftswomen, related professions, (xxi) Surveying, (xxii) Special technical forces, (xxiii) Sales professions (retail), (xxiv) Wholesale, retail salesmen, (xxv) Banking, insurance professionals, (xxvi) Other commercial professions (excluding wholesale, retail, banking), (xxvii) Advertising professionals, (xxviii) Transport Professions, (xxix) Aviation, shipping professions, (xxx) Packers, warehouse-, transport workers, (xxxi) Management, auditing, management consulting, (xxxii) Administrative professions in the public sector, (xxxiii) Finance, accounting, bookkeeping, (xxxiv) Core IT Professions, (xxxv) Commercial office professions, (xxxvi) Office assistant, telephone operator, (xxxvii) Personal security, guard professions, (xxxviii) Janitor, (xxxix) Security Professions, (xl) Legal professions, (xli) Artists, musicians, (xlii) Designers, photographers, advertising producers (xliii) Health professions with license, (xliv) Health professions without license, (xlv) Social professions, (xlvi) Teachers, (xlvii) Journalism, library-, translation-, related science professions, (xlviii) Professions in personal care, (xlix) Hotel-, restaurant professions, housekeeping, (l) Cleaning-, waste disposal professions, (li) Other professions.

A3.3 Synthetic Difference-in-Differences Estimation

For a robustness check, I use synthetic difference-in-differences estimation following the procedure described by Arkhangelsky et al. (2021), where I compare the border regions in Germany and the Czech Republic to an artificial control group created from the pool of all available controls.[30] To compute point estimates and standard errors, I use the stata command and code described in Clarke et al. (2023). Standard errors are computed using 100 bootstrap resamples. For the choice of variables, I partly follow Dustmann et al. (2017) (Online Appendix) who use synthetic control matching following Abadie et al. (2010) in a similar context.

The Czech Republic For the Czech Republic, I use county-level data provided by the Czech Statistical Office to construct the variables that enter the synthetic control group matching. These are the following:

- The value of the outcome variable in each pre-treatment year from 2007-2010.
- The growth in the total population between 2005 and 2010.
- The pre-treatment (2007-2010) mean in the share of the working age population.
- The pre-treatment (2007-2010) mean in the share of firms in manufacturing.
- The pre-treatment (2007-2010) mean in the share of firms in agriculture.
- The pre-treatment (2007-2010) mean in the share of firms in construction.
- The pre-treatment (2007-2010) mean in the share of firms in retail/wholesale.
- The pre-treatment (2007-2010) mean in the share of firms in the hospitality sector.
- The pre-treatment (2007-2010) mean in the share of firms in the transport sector.
- The share of German-owned firms.

[30] This is a new method that combines principles from standard diff-in-diff estimation with those from synthetic control matching as in Abadie et al. (2010). The main advantage of synthetic difference-in-differences as described by Arkhangelsky et al. (2021) is that it (i) allows for a violation of parallel trends, (ii) optimally weighs time periods, and (iii) allows for level differences by treatment group.

Germany For Germany, I use data provided by the IAB in the *Establishment History Panel (BHP7519),* aggregated to the county level. I define treated counties as depicted in Figure E14. I then restrict the sample to West Germany. The following variables are used in the algorithm:

- The value of the outcome variable in each pre-treatment year from 2007-2010.
- Native wage growth between 2007 and 2010, where the wage corresponds to the average across mean establishment wages in a given municipality, deflated with base year 2010.
- The growth in EU workers' employment as a share of total employment between 2004 and 2010.
- Native employment growth in 2007-2010.
- The pre-treatment (2007-2010) mean in the share of low-skilled workers (workers without vocational training), relative to total municipality employment in 2010.
- The pre-treatment (2007-2010) mean in the share of migrant workers, relative to total municipality employment in 2010.
- The pre-treatment (2007-2010) mean in the share of workers aged 15-29 and 30-49, relative to total municipality employment in 2010.
- The pre-treatment (2007-2010) mean in the share of firms in the manufacturing sector.
- The pre-treatment (2007-2010) mean in the share of firms in the service sector.
- The pre-treatment (2007-2010) mean in the share of firms in agriculture.
- The pre-treatment (2007-2010) mean in export exposure.
- The share of firms with a Czech affiliate.

A3.4 Industry Reweighting for the Czech Republic

For a robustness check, I use a reweighting algorithm following DiNardo et al. (1996) to investigate whether my baseline results change when I reweight Czech border counties to matched controls with respect to their industry composition in 2010.

For this purpose, I regress a dummy for being located in the control regions on the share of firms in a given 1-digit industry. I have information on the following industries: Manufacturing, agriculture, construction, wholesale/retail, hospitality, transport, IT, finance and insurance, real estate, and science.

I then use the predicted propensity scores $\hat{p}$ to construct the weights as $\hat{\phi} = \hat{p}/(1-\hat{p})$. Control regions are assigned a weight of 1.

A4 Additional Robustness Checks

Synthetic Difference-in-Difference Estimation I show that my results are robust to a variety of different specifications. First, I use synthetic difference-in-differences estimation as proposed by Arkhangelsky et al. (2021) where I use a synthetic control group instead of the control group generated via mahalanobis matching (see more details on how I implement this in Appendix Section A3.3). In each regression, I compute standard errors using 100 bootstrap resamples.

Figure C5 presents the results for the four main outcome variables for the Czech Republic: the share of German residents (Panel a), unemployment rates (Panel b), relative vacancies (Panel c), and log applicants per job (Panel d). One difference to the baseline results is that the result for unemployment rates is estimated much more noisily. The only significant coefficient is in 2017 (.1ppt, corresponding roughly to the baseline estimate for 2017). In contrast, the coefficients for relative vacancies are less noisy. The synthetic diff-in-diff results show a significant increase in border counties in 2012-2015.

Figure C6 presents the results for West Germany. Panels (a) to (c) display unemployment, log native full-time wages, and employment. The coefficients are highly variable and indicate no significant labor market effects, consistent with my baseline findings. One notable difference is that, in the synthetic difference-in-differences specification, unemployment

rates declined significantly by 1 percentage point in 2017.

Consistent with this, Panel (d) shows vacancies relative to their 2010 levels. It indicates that vacancy trends in the border and control regions remained similar throughout the post-opening period, except in 2017, when vacancies in the border region were 40% higher than in 2010.

Figure C7 presents additional outcomes for West Germany. Panel (a) displays the share of migrant workers, which increased from 0% to approximately 2% between 2010 and 2017. This is slightly lower than in the baseline analysis (3ppt). Panels (b) and (c) show import and export exposure to EU10 countries. Despite similar matching variables, the synthetic difference-in-differences method fails to select a control group that ensures parallel trends in import and export exposure after 2011.

Therefore, the synthetic difference-in-differences results should be interpreted with caution. For example, the lower unemployment rates and higher vacancy levels observed in Figure C6 may reflect a combination of trade and migration effects.

Random Control Group For another robustness check, instead of matching, I randomly select a control region for each treated region. I report the results for the Czech republic in Figure C8. Using a random control group yields very similar results, and pre-treatment trends align well.

In contrast, for West Germany (Figure C9), several variables exhibit pre-trends, indicating that the two types of regions are not a suitable comparison. Additionally, Panel (a) of Figure C9 shows a small differential migrant inflow to the border region, likely because some control regions also experienced significant migrant inflows. In the baseline analysis, I address this issue by explicitly matching on the increase in EU workers' employment between 2004 and 2010.

Alternative Definitions of Treatment Region in West Germany I define the German border region as all municipalities within 60-minute driving distance to the nearest road border crossing into the Czech Republic. My results are, however, robust to adjusting this definition. As Figure E7 shows, the main outcome variables, unemployment rates

and log native full-time wages, look very similar when instead defining the border region as all municipalities within 40km airline distance from the nearest border crossing, or all municipalities within 60km driving distance from the nearest border crossing.

Narrow vs. Wider Border Region in West Germany A natural question is whether, as in Beerli et al. (2021) and Dustmann et al. (2017), the "wider border region", i.e., the municipalities bordering those in the treatment group, would be an alternative control group. I examine this more closely, defining the wider border region as all municipalities located within a 60-to-120-minute driving distance from the nearest road border crossing into the Czech Republic. There are two main reasons why I do not use them as the control group in my baseline specification:

First, as evident from Figure E8, there was no differential treatment in terms of migrant worker shares in the narrow vs. wider border region. Second, as Table B9 shows, narrow and wider border region differ in a number of key characteristics. This holds, for example, with respect to the workforce composition, with the narrow border region reporting a higher share of younger workers, medium-skilled and low-skilled workers.

The structural difference in narrow and wider border region is also evident from Panels (e) and (f) of Figure E8. Both import and export intensity are considerably lower in the narrow border region, suggesting that it is less well integrated in overall trade flows. The comparison between narrow and wider border regions therefore does not appear to be ideal.

Changing the Reference Year to 2009 One potential concern is that labor markets in the border region were already affected by anticipation effects in 2010, and using this year as the reference could introduce bias into the results. Therefore, in Figures C12 and C13, I examine the impact of using 2009 instead of 2010 as the reference year. The results remain largely unchanged.

Placebo Analysis As another robustness check, I conduct a placebo treatment analysis for the Czech Republic and West Germany, presented in Figures C10 and C11. For this purpose, I change my sample period to 2005-2011 and pretend that the policy reform took

place in 2007, the year when border controls were eliminated. I then re-estimate the baseline regression model (see Equation 1), where I omit 2006 as the reference year.

There are zero effects for most outcome variables. The only exception are migrant worker flows which marginally increase post 2007 both on the German side of the border (Panel a of Figure C11) and on the Czech side (Panel a of Figure C10). For Germany, the increase is substantially lower than in the years following the labor market opening. For the Czech Republic, however, there is a substantial increase in the share of German residents. This also reflects the trends in Figure 1, Panel d, which shows that the share of German residents started to increase as early as 2006.

Bartik Controls for West Germany In my main regression specification for West Germany, I include Bartik controls, which I construct following Beerli et al. (2021) (see Appendix Section A1.3 for details). I construct two separate controls: The *Bartik employment control* controls for region- and sector-specific employment trends, and the *Bartik wage control* controls for region-and sector-specific wage trends.

Table B11 shows regression coefficients with and without Bartik controls. Adding the Bartik controls does not alter the main conclusions, although the coefficients change somewhat. For instance, as shown in Panel A of Table B11, controlling for region- and sector-specific employment trends slightly reduces the diff-in-diff coefficients on post-2011 migrant worker shares, suggesting that part of the inflow to the border region may have been driven by labor demand.[31] The coefficient on the migrant share decreases by .5ppt, from 1.7 to 1.3ppt.

Turning to the main labor market outcome variables in Panel B, I find that the post-2011 coefficient on the unemployment rate (Columns 1 and 2) slightly decreases when adding the Bartik control. However, the change only affects the fourth decimal place. The coefficient on native employment changes from -0.012 to 0.0034, but both estimates are statistically insignificant (Columns 3 and 4). The Bartik wage control moreover has little effect on log native full-time wages (Columns 5 and 6).

[31]Note that, following Beerli et al. (2021), I add the Bartik employment control to the migrant share regressions.

Informal Work in West Germany One concern for my analysis is that a substantial share of EU8 workers might have worked in informal employment before the 2011 policy change, such that the documented increase in migrant worker shares merely reflects a transition from informal to formal employment contracts in Germany. To the best of my knowledge, there is no individual-level data on informal employment available, but a study by Enste (2017) documents the sectors most susceptible to informal work based on survey data from 2007.

According to Enste (2017), the three sectors that comprised almost 50% of illegal employment contracts in 2007 were (i) construction, (ii) services for private households, and (iii) car repair. Including these sectors may therefore downward-bias the regression coefficients for the labor market effects on natives in Germany. As Figure E12 shows, however, excluding these sectors from the main regression analysis hardly changes the worker-level event study results.

Border Region to West Germany in the Czech Republic In my baseline analysis, I include both the Czech border region to East and West Germany. However, I show that the Czech migrant outflow to East Germany was considerably lower. In a robustness check, I therefore restrict my sample to Czech counties bordering West Germany, only.

Figure C14 plots the main results for the share of migrant/German residents (Panel a), unemployment rates (Panel b), relative vacancies (Panel c), and log applicants per job (Panel d). Coefficients remain largely unchanged; one exception are unemployment rates, where the coefficients are quantitatively similar, but very noisy and therefore statistically insignificant.

Incumbent Worker Matching In a final robustness check, I show what happens if I change the matching for the incumbent worker analysis in West Germany to a more restrictive version. In variations to the baseline matching (see Section 5.3), I add years of education to the list of exact matching variables. I then vary the list of mahalanobis distance matching variables to include age, experience, and employment status, all measured in 2010. As Figure E13 shows, this yields largely similar results.

A5 Labor Market Effects by Occupations and Industries

In an additional analysis, I investigate how the inflow of migrants from EU8 countries was distributed across 1-digit industries and 1-digit occupations in West Germany. Figure E9 shows that the worker inflow was concentrated in three sets of occupations in particular: "manufacturing & repair", "traffic & security", and "food & cleaning"[32]. In 2010, these three occupations altogether accounted for about 28.5% of employment in my analysis sample, split approximately equally among the three.[33] The figure plots difference-in-differences coefficients from a regression with municipality and year fixed effects. In the figure, "pre 2010" refers to an interaction of the average effect for 2005-2009 with a dummy for border region, and "post 2010" refers to the average effect for 2011-2017 interacted with a dummy for border region. All effects thus must be interpreted relative to 2010.

As Panel (a) of Figure E9 shows, the sector "manufacturing & repair" received the highest inflow of EU8 workers, amounting to approximately 1 percentage point in the post-reform period. This inflow was similar for "traffic & security" (0.9 ppt) and somewhat lower for "food & cleaning" (0.23 ppt). The inflow to all other occupations was substantially lower.

Panel (b) shows that in line with the migrant worker inflow, native employment grew more slowly in "traffic & security" (coefficient statistically insignificant) and "food & cleaning" (-1ppt). There is also a negative coefficient for "law, management & economics" occupations, but given the 0 effect on migrant shares in Panel (a), this must be unrelated to the migrant worker inflow. Interestingly, Panel (c) of Figure E9 reports a positive wage effect for workers in "food & cleaning". This could be due to the changing composition of workers, i.e., because lower-earning workers leave the "food & cleaning" occupation.

[32]This follows a classification provided by the German Federal Institute for Vocational Education and Training. "Manufacturing & repair" consists of the following 2-digit occupations: (i) stone processing, building materials production, ceramics, glass professions; (ii) metal-, plant engineering, sheet metal construction, installation, assemblers; (iii) driving-, aircraft construction, maintenance professions; (iv) precision engineering, related professions; (v) electrical professions; (vi) textile processing, leather production; (vii) building trades, wood, plastics processing and machining; (viii) unskilled laborers; (ix) janitors. "Traffic & security" consists of the following 2-digit occupations: (i) transport professions; (ii) aviation, shipping professions; (iii) packers, warehouse-, transport workers; (iv) personal security, guard professions; (v) security Professions. "Food & cleaning" consists of the following 2-digit occupations: (i) chefs; (ii) hotel-, restaurant professions, housekeeping; (iii) cleaning-, waste disposal professions.

[33]These are the precise numbers: 7.5% for "manufacturing & repair", 11% for "traffic & security", and 10% for "food & cleaning".

Figure E10 presents the corresponding graphs for 1-digit industries, showing that the share of EU8 workers increased in 9 industries by up to .4ppt. Three industries report the slowest growth in employment relative to controls (not statistically significant):"retail", "production goods", and "commercial services". Wage effects are mostly insignificant; a small positive wage increase in "retail" may be due to compositional changes in the workforce.

Table A1: Difference-in-Differences Estimates for Industry Composition - Czech Republic

	(1)	(2)	(3)	(4)	(5)
Panel A:	Agriculture	Manufacturing	Construction	Wholesale/Retail	Transport/Storage
Diff-in-Diff	-0.00053	-0.00077	-0.00019	-0.0084	0.00031
	(0.0012)	(0.0019)	(0.0017)	(0.0051)	(0.00051)
Observations	360	360	360	360	360
Dep. Var Mean in BR in 2010	0.056	0.13	0.13	0.25	0.028
Scaled Effect (% of Mean)	-0.94	-0.61	-0.15	-3.29	1.12
County FE	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes
Panel B:	Hospitality	ICT	Finance/Insurance	Real Estate	Science
Diff-in-Diff	0.0012	0.0010	-0.0013	-0.00030	-0.0055
	(0.00086)	(0.00056)*	(0.00071)*	(0.00069)	(0.0020)**
Observations	360	360	360	360	360
Dep. Var Mean in BR in 2010	0.071	0.013	0.015	0.045	0.096
Scaled Effect (% of Mean)	1.76	7.86	-8.57	-0.66	-5.72
County FE	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes

Notes: This table shows how the industry composition in the Czech border region changed following the outflow of Czech workers. It presents coefficients from a difference-in-differences regression with matched pair id × year and county fixed effects and standard errors clustered at the county level. Diff-in-Diff reports the coefficient on the interaction of a dummy for being located in the border region with a dummy for all years from 2011. Industry shares correspond to the number of firms in a given industry, divided by all firms in 2010. ICT stands for "information and communication technology". *, ** and *** correspond to 10, 5 and 1 percent significance levels, respectively.

Table B1: Summary Statistics - Native Workers in Matched West German Regions in 2010

	(1)		(2)		(3)		(4)		(5)	
	All				Matched				(4)-(3)	
	Control		Treatment		Control		Treatment			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Difference	p-Value
Panel A: Earnings and Employment										
Total yearly earnings	21269.5	[17328.9]	20725.9	[16513.2]	28847.0	[14512.4]	27586.6	[14018.1]	**-1260.5**	1.0e-26
Daily wage (EUR)	62.50	[45.29]	61.10	[43.19]	80.68	[38.95]	77.47	[37.45]	**-3.20**	3.9e-24
Days per year working	275.8	[144.0]	279.3	[140.6]	353.6	[39.60]	351.5	[41.90]	**-2.09**	5.3e-10
Full-time job	0.536	[0.499]	0.550	[0.498]	0.743	[0.437]	0.742	[0.437]	-0.00072	0.84
Panel B: Demographics										
Female	0.500	[0.500]	0.502	[0.500]	0.454	[0.498]	0.454	[0.498]	0	1
Age (years)	41.15	[13.59]	41.02	[13.47]	41.86	[11.37]	41.66	[11.53]	**-0.20**	0.033
Education (years)	10.86	[1.286]	10.84	[1.312]	10.97	[1.278]	10.95	[1.317]	-0.019	0.081
Tenure (years)	7.372	[6.576]	7.445	[6.527]	9.166	[6.646]	9.002	[6.615]	**-0.16**	0.0028
Panel C: Firm Characteristics										
Log firmsize	3.929	[1.829]	3.964	[1.879]	4.104	[1.755]	4.089	[1.772]	-0.015	0.31
FDI firm	0.0455	[0.208]	0.0851	[0.279]	0.0618	[0.241]	0.0618	[0.241]	0	1
Observations	63561		49704		29362		29362			

Notes: This table presents labor market, demographic and firm characteristics of all native workers in the matched German regions (columns 1-2), and all native incumbent workers in the matched German regions (columns 3-4) in 2010. Column (5) presents the difference between non-border vs. border municipalities and respective p-values from a t-test for equal means. Incumbent workers were employed in a social-security job in the border region (or matched control municipalities) in 2010. FDI firm indicates whether workers were employed in a firm with an affiliate in the Czech Republic. Border municipalities are all municipalities located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. Differences in bold signal statistical significance at the 5%-level.

Table B2: 1-Digit Occupations - Native Workers in Matched Regions in 2010

	(1)		(2)		(3)		(4)		(5)	
	All				Matched				(4)-(3)	
	Control		Treatment		Control		Treatment			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Difference	p-Value
Raw Materials	0.0128	[0.112]	0.00976	[0.0983]	0.00875	[0.0931]	0.00875	[0.0931]	0	1
Education	0.0124	[0.110]	0.0113	[0.106]	0.00937	[0.0963]	0.00937	[0.0963]	0	1
Machine Operations/Maintenance	0.0992	[0.299]	0.102	[0.302]	0.117	[0.321]	0.117	[0.321]	0	1
Trade/Sales	0.111	[0.314]	0.107	[0.309]	0.0996	[0.299]	0.0996	[0.299]	0	1
Traffic/Security	0.116	[0.321]	0.114	[0.318]	0.101	[0.302]	0.101	[0.302]	0	1
Food/Cleaning	0.105	[0.307]	0.109	[0.312]	0.0642	[0.245]	0.0642	[0.245]	0	1
Services	0.173	[0.379]	0.168	[0.374]	0.189	[0.391]	0.189	[0.391]	0	1
Technicians	0.0628	[0.243]	0.0609	[0.239]	0.0686	[0.253]	0.0686	[0.253]	0	1
Law/Management/Economics	0.0236	[0.152]	0.0234	[0.151]	0.0269	[0.162]	0.0269	[0.162]	0	1
Arts	0.00685	[0.0825]	0.00664	[0.0812]	0.00419	[0.0646]	0.00419	[0.0646]	0	1
Health/Care	0.126	[0.332]	0.122	[0.327]	0.133	[0.340]	0.133	[0.340]	0	1
Education	0.0124	[0.110]	0.0113	[0.106]	0.00937	[0.0963]	0.00937	[0.0963]	0	1
Observations	63561		49704		29362		29362			

Notes: This table presents the distribution across 1-digit occupations of all native workers in the matched West German regions (columns 1-2), and all native incumbent workers in the matched West German regions (columns 3-4) in 2010. Column (5) presents the difference between non-border vs. border municipalities and respective p-values from a t-test for equal means. Incumbent workers were employed in a social-security job in the border region (or matched control municipalities) in 2010. Border municipalities are all municipalities located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. Differences in bold signal statistical significance at the 5%-level.

Table B3: 1-Digit Industries - Native Workers in Matched Regions in 2010

	(1)		(2)		(3)		(4)		(5)	
	All				Matched				(4)-(3)	
	Control		Treatment		Control		Treatment			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Difference	p-Value
Agriculture	0.00775	[0.0877]	0.00598	[0.0771]	0.00480	[0.0691]	0.00480	[0.0691]	0	1
Mining, Energy	0.00871	[0.0929]	0.00894	[0.0941]	0.00879	[0.0933]	0.00879	[0.0933]	0	1
Food Manufacturing	0.0378	[0.191]	0.0366	[0.188]	0.0350	[0.184]	0.0350	[0.184]	0	1
Consumption Goods	0.0503	[0.219]	0.0446	[0.206]	0.0443	[0.206]	0.0443	[0.206]	0	1
Production Goods	0.0646	[0.246]	0.0765	[0.266]	0.0792	[0.270]	0.0792	[0.270]	0	1
Investment Goods	0.122	[0.327]	0.129	[0.335]	0.146	[0.353]	0.146	[0.353]	0	1
Construction	0.0589	[0.236]	0.0597	[0.237]	0.0673	[0.251]	0.0673	[0.251]	0	1
Retail	0.167	[0.373]	0.164	[0.370]	0.165	[0.371]	0.165	[0.371]	0	1
Traffic, Telecommunication	0.0450	[0.207]	0.0451	[0.208]	0.0434	[0.204]	0.0434	[0.204]	0	1
Credit, Insurance	0.0281	[0.165]	0.0253	[0.157]	0.0311	[0.174]	0.0311	[0.174]	0	1
Restaurants	0.0402	[0.197]	0.0438	[0.205]	0.0215	[0.145]	0.0215	[0.145]	0	1
Education	0.0311	[0.173]	0.0320	[0.176]	0.0300	[0.171]	0.0300	[0.171]	0	1
Health	0.121	[0.326]	0.124	[0.330]	0.139	[0.346]	0.139	[0.346]	0	1
Commercial Services	0.114	[0.317]	0.107	[0.309]	0.0927	[0.290]	0.0927	[0.290]	0	1
Other Services	0.0402	[0.197]	0.0354	[0.185]	0.0219	[0.146]	0.0219	[0.146]	0	1
Non-Profit	0.0120	[0.109]	0.0147	[0.120]	0.00903	[0.0946]	0.00903	[0.0946]	0	1
Public Administration	0.0523	[0.223]	0.0480	[0.214]	0.0617	[0.241]	0.0617	[0.241]	0	1
Observations	63561		49704		29362		29362			

Notes: This table presents the distribution across 1-digit industries of all native workers in the matched West German regions (columns 1-2), and all native incumbent workers in the matched West German regions (columns 3-4) in 2010. Column (5) presents the difference between non-border vs. border municipalities and respective p-values from a t-test for equal means. Incumbent workers were employed in a social-security job in the border region (or matched control municipalities) in 2010. Border municipalities are all municipalities located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. Differences in bold signal statistical significance at the 5%-level.

Table B4: Native Worker vs. EU8 Worker Characteristics

	(1) German Workers 2010		(2) EU8 Workers 2012		(3) (2)-(1)	
	Mean	SD	Mean	SD	Difference	p-Value
Panel A: Earnings and Employment						
Total yearly earnings	19268.7	[15261.0]	16208.8	[13653.6]	**-3059.9**	3.5e-16
Daily Wage (EUR)	60.84	[40.43]	54.68	[36.09]	**-6.16**	5.8e-10
Full-time Daily Wage	76.48	[36.37]	65.96	[32.58]	**-10.5**	9.7e-24
Days worked per year	270.1	[133.8]	255.3	[129.7]	**-14.8**	0.0000071
Panel B: Demographics						
Female	0.502	[0.500]	0.347	[0.476]	**-0.16**	1.3e-36
Age in years	41.33	[12.91]	38.76	[11.08]	**-2.57**	5.5e-16
Share without vocational training	0.137	[0.344]	0.298	[0.457]	**0.16**	2.2e-79
Share with vocational training	0.752	[0.432]	0.580	[0.494]	**-0.17**	4.0e-59
Share with university degree	0.111	[0.314]	0.123	[0.328]	0.012	0.12
Residency outside Germany	0.000523	[0.0229]	0.541	[0.498]	**0.54**	0
Manufacturing sector	0.440	[0.496]	0.437	[0.496]	-0.0031	0.80
Service sector	0.538	[0.499]	0.541	[0.498]	0.0033	0.79
Agriculture	0.0100	[0.0997]	0.00659	[0.0809]	-0.0035	0.16
Observations	145384		1670			

Notes: This table presents the characteristics of native workers (Column 1, in 2010) and workers from the EU8 countries (Column 2, in 2012) in the German border region in the 15% worker sample of the German social-security data. Column (3) shows the difference in means and respective p-values from a t-test for equal means. Panel A shows how EU8 and native workers differ in terms of earnings, log wages, and employment. Panel B shows how EU8 and native workers differ with respect to demographics such as gender, age, and education. Residency outside Germany is a dummy indicating whether a worker is reported to 'live abroad' in the administrative data. I show the characteristics of EU8 workers in 2012 because this is a year where a substantial number of them is already commuting across the border. In contrast, native workers' characteristics are reported in 2010, to ensure that they are not yet affected by the inflow. Differences in bold signal statistical significance at the 5%-level. The border region is defined as all municipalities located within 60-minute driving time to the next Czech-German border crossing.

Table B5: Summary Statistics - Native and EU8 Worker Distribution Across 1-Digit Occupations

	(1) German Workers 2010		(2) EU8 Workers 2012		(3) (2)-(1)	
	Mean	SD	Mean	SD	Difference	p-Value
Raw Materials	0.0158	[0.125]	0.0276	[0.164]	**0.012**	0.00013
Education	0.0260	[0.159]	0.0126	[0.112]	**-0.013**	0.00061
Machine Operations/Maintenance	0.0878	[0.283]	0.114	[0.318]	**0.026**	0.00016
Trade/Sales	0.101	[0.302]	0.0319	[0.176]	**-0.069**	7.7e-21
Traffic/Security	0.107	[0.309]	0.108	[0.310]	0.00045	0.95
Food/Cleaning	0.0901	[0.286]	0.195	[0.396]	**0.10**	3.6e-49
Services	0.172	[0.377]	0.0361	[0.186]	**-0.14**	1.3e-48
Technicians	0.0779	[0.268]	0.0276	[0.164]	**-0.050**	2.3e-14
Law/Management/Economics	0.0294	[0.169]	0.00901	[0.0945]	**-0.020**	0.00000089
Arts	0.00958	[0.0974]	0.00901	[0.0945]	-0.00056	0.82
Health/Care	0.128	[0.334]	0.109	[0.311]	**-0.019**	0.018
Education	0.0260	[0.159]	0.0126	[0.112]	**-0.013**	0.00061
Observations	145384		1670			

Notes: This table presents the occupational distribution (1-digit) of native workers (Column 1, in 2010) and workers from the EU8 countries (Column 2, in 2012) in the German border region in the 10% worker sample of the German social-security data. Column (3) shows the difference in means and respective p-values from a t-test for equal means. I show the characteristics of EU8 workers in 2012 because this is a year where a substantial number of them is already working in the border region. In contrast, native workers' characteristics are reported in 2010, to ensure that they are not yet affected by the inflow. Differences in bold signal statistical significance at the 5%-level. The border region is defined as all municipalities located within 60-minute driving time to the next Czech-German border crossing.

Table B6: Summary Statistics - Native and EU8 Worker Distribution Across 1-Digit Industries

	(1) German Workers 2010		(2) EU8 Workers 2012		(3) (2)-(1)	
	Mean	SD	Mean	SD	Difference	p-Value
Agriculture	0.0123	[0.110]	0.0156	[0.124]	0.0033	0.23
Mining, Energy	0.0101	[0.0998]	0.00659	[0.0809]	-0.0035	0.16
Food Manufacturing	0.0287	[0.167]	0.0324	[0.177]	0.0037	0.37
Consumption Goods	0.0414	[0.199]	0.0264	[0.160]	**-0.015**	0.0021
Production Goods	0.0516	[0.221]	0.0761	[0.265]	**0.024**	0.0000075
Investment Goods	0.118	[0.322]	0.131	[0.338]	0.014	0.086
Construction	0.0603	[0.238]	0.0923	[0.289]	**0.032**	0.000000052
Retail	0.141	[0.348]	0.0785	[0.269]	**-0.062**	3.6e-13
Traffic, Telecommunication	0.0469	[0.211]	0.0443	[0.206]	-0.0026	0.62
Credit, Insurance	0.0207	[0.142]	0.00479	[0.0691]	**-0.016**	0.0000052
Restaurants	0.0395	[0.195]	0.126	[0.332]	**0.087**	7.4e-72
Education	0.0512	[0.220]	0.0168	[0.128]	**-0.034**	2.0e-10
Health	0.122	[0.328]	0.105	[0.306]	**-0.018**	0.029
Commercial Services	0.141	[0.348]	0.183	[0.387]	**0.042**	0.00000076
Other Services	0.0383	[0.192]	0.0485	[0.215]	**0.010**	0.030
Non-Profit	0.0164	[0.127]	0.00659	[0.0809]	**-0.0098**	0.0016
Public Administration	0.0612	[0.240]	0.00539	[0.0733]	**-0.056**	2.0e-21
Observations	145384		1670			

Notes: This table presents the occupational distribution (1-digit) of native workers (Column 1, in 2010) and workers from the EU8 countries (Column 2, in 2012) in the German border region in the 10% worker sample of the German social-security data. Column (3) shows the difference in means and respective p-values from a t-test for equal means. I show the characteristics of EU8 workers in 2012 because this is a year where a substantial number of them is already working in the border region. In contrast, native workers' characteristics are reported in 2010, to ensure that they are not yet affected by the inflow. Differences in bold signal statistical significance at the 5%-level. The border region is defined as all municipalities located within 60-minute driving time to the next Czech-German border crossing.

Table B7: Summary Statistics - Native and EU8 Worker Establishment Characteristics

	(1) German Workers 2010		(2) EU8 Workers 2012		(3) (2)-(1)	
	Mean	SD	Mean	SD	Difference	p-Value
Panel A: Workforce Shares						
High-skilled	0.135	[0.196]	0.0810	[0.154]	**-0.054**	4.6e-29
Medium-skilled	0.761	[0.217]	0.722	[0.223]	**-0.039**	3.4e-13
Marginally employed	0.143	[0.229]	0.165	[0.237]	**0.021**	0.00015
Panel B: Establishment Type						
Estab. age (in years)	16.32	[9.597]	16.47	[12.04]	0.15	0.53
Affiliate in the Czech Republic	0.0519	[0.222]	0.0461	[0.210]	-0.0058	0.29
Daily ave. wage in estab. (in EUR)	80.12	[34.63]	72.76	[29.41]	**-7.36**	6.2e-17
Daily ave. native wage in estab. (in EUR)	80.12	[34.55]	75.88	[29.05]	**-4.23**	0.0000023
Observations	145384		1670			

Notes: This table presents establishment characteristics of native workers (Column 1, in 2010) and workers from the EU8 countries (Column 2, in 2012) in the German border region in the 10% worker sample of the German social-security data. Column (3) shows the difference in means and respective p-values from a t-test for equal means. Panel A presents the establishment skill composition, where high-skilled workers have a university degree, medium-skilled workers have completed vocational training, and low-skilled workers have no vocational training. Panel B presents additional characteristics on the establishment's age, whether it has an affiliate in the Czech Republic, and average full-time wages. I show the characteristics of EU8 workers in 2012 because this is a year where a substantial number of them is already working in the border region. In contrast, native workers' characteristics are reported in 2010, to ensure that they are not yet affected by the inflow. Differences in bold signal statistical significance at the 5%-level. The border region is defined as all municipalities located within 60-minute driving time to the next Czech-German border crossing.

Table B8: Summary Statistics of German Municipalities in 2010

	(1) All Municipalities		(2) Matched Controls		(3) Border Region		(4) (3)-(2)	
	Mean	SD	Mean	SD	Mean	SD	Difference	p-Value
Panel A: Employment								
Native Workers (levels)	2903.0	[20257.8]	3961.2	[14006.2]	3374.9	[14066.4]	-586.3	0.56
Share Migrant Workers	0.0414	[0.0496]	0.0242	[0.0205]	0.0194	[0.0170]	**-0.0048**	0.00034
Share Migrant Workers from EU	0.0193	[0.0319]	0.00938	[0.00880]	0.0123	[0.0139]	**0.0029**	0.00048
Share Full-time Workers	0.509	[0.160]	0.568	[0.103]	0.570	[0.0985]	0.0022	0.76
Panel B: Daily Wages (EUR)								
Native Average Wages	62.55	[12.33]	61.44	[8.192]	59.69	[7.892]	**-1.75**	0.0022
Mean Wages	61.87	[11.86]	61.02	[7.981]	59.37	[7.765]	**-1.65**	0.0032
Panel C: Workforce Characteristics								
Share Workers Aged 15-29	0.168	[0.0649]	0.172	[0.0332]	0.173	[0.0355]	0.0013	0.61
Share Workers Aged 30-49	0.468	[0.0833]	0.476	[0.0260]	0.476	[0.0308]	-0.00097	0.63
Share Female Workers	0.469	[0.131]	0.489	[0.0819]	0.489	[0.0873]	-0.00021	0.97
Share High-skilled Workers	0.0687	[0.0534]	0.0721	[0.0364]	0.0714	[0.0436]	-0.00071	0.80
Share Medium-skilled Workers	0.775	[0.0881]	0.805	[0.0382]	0.814	[0.0403]	**0.0089**	0.0014
Share Low-skilled Workers	0.128	[0.0692]	0.107	[0.0440]	0.104	[0.0474]	-0.0035	0.28
Panel D: Other Characteristics								
Share FDI Firms	0.00282	[0.00686]	0.00505	[0.00585]	0.00742	[0.00889]	**0.0024**	0.000010
Import Exposure (in 1000 EUR)	24.11	[85.85]	29.14	[53.47]	27.75	[55.09]	-1.39	0.72
Export Exposure (in 1000 EUR)	20.99	[80.91]	25.09	[47.43]	25.47	[54.43]	0.38	0.92
East Germany	0.226	[0.418]	0.411	[0.493]	0.411	[0.493]	0	1
Distance to CZ Border (km)	267.7	[129.0]	176.4	[106.6]	25.19	[14.09]	**-151.2**	1.7e-120
Observations	10806		397		397			

Notes: This table presents the characteristics of German municipalities in the year before the policy change. Column (1) presents all German municipalities, Column (2) presents all matched non-border municipalities, Column (3) presents all matched border municipalities, and Column (4) shows the difference between non-border vs. border municipalities and respective p-values from a t-test for equal means. Municipalities are matched using mahalanobis distance matching, separately within East vs. West Germany. See Appendix A3.1 for a detailed description of the baseline mahalanobis distance matching algorithm. High-skilled workers have a university degree, medium-skilled workers have completed vocational training, low-skilled workers have no vocational training. FDI establishments are German establishments with affiliates in the Czech Republic. Import and export exposure are measured in 1000 EUR per worker. Treated municipalities are all municipalities located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. Differences in bold signal statistical significance at the 5%-level.

Table B9: Summary Statistics of Narrow and Wider Border Region in Germany in 2010

	(1) All Regions		(2) Matched Controls		(3) Border Region		(4) (3)-(2)	
	Mean	SD	Mean	SD	Mean	SD	Difference	p-Value
Panel A: Employment								
Native Employment (levels))	3052.3	[18462.2]	2606.2	[12283.0]	1416.0	[3276.0]	-1190.2	0.17
Share Foreign Workers	0.0511	[0.0512]	0.0378	[0.0303]	0.0302	[0.0246]	**-0.0077**	0.0010
Share Foreign Workers from EU	0.0238	[0.0341]	0.0173	[0.0188]	0.0210	[0.0215]	**0.0037**	0.018
Share Full-time Workers	0.470	[0.145]	0.507	[0.105]	0.528	[0.108]	**0.022**	0.0099
Panel B: Wages								
Native Average Wages	65.64	[11.70]	66.87	[6.076]	64.04	[6.028]	**-2.82**	7.2e-09
Average Wages	64.79	[11.24]	66.24	[6.019]	63.73	[6.003]	**-2.50**	0.00000022
Panel C: Workforce Characteristics								
Share Workers Aged 15-29	0.173	[0.0655]	0.192	[0.0401]	0.188	[0.0483]	-0.0041	0.22
Share Workers Aged 30-49	0.470	[0.0840]	0.479	[0.0367]	0.488	[0.0400]	**0.0096**	0.0013
Share Female Workers	0.480	[0.127]	0.495	[0.0978]	0.487	[0.104]	-0.0084	0.29
Share High-skilled Workers	0.0626	[0.0519]	0.0514	[0.0327]	0.0414	[0.0285]	**-0.010**	0.000083
Share Medium-skilled Workers	0.758	[0.0845]	0.791	[0.0457]	0.800	[0.0500]	**0.0098**	0.0088
Share Low-skilled Workers	0.148	[0.0632]	0.140	[0.0328]	0.146	[0.0447]	**0.0063**	0.027
Panel D: Other Characteristics								
Share FDI Establishments	0.00280	[0.00672]	0.00535	[0.00802]	0.00865	[0.0122]	**0.0033**	0.0000060
Import Exposure (in 1000 EUR)	24.42	[68.40]	20.40	[39.42]	19.90	[23.89]	-0.50	0.86
Export Exposure (in 1000 EUR)	28.60	[89.32]	25.07	[54.14]	23.98	[27.63]	-1.09	0.78
Distance to CZ Border (km)	293.1	[120.2]	82.95	[32.46]	19.56	[9.437]	**-63.4**	3.4e-121
Observations	8365		725		201			

Notes: This table presents the characteristics of German municipalities in the year before the policy change. Column (1) presents all German municipalities, Column (2) presents all municipalities in the wider border region (located within a 60-120-minute driving distance from the nearest road border crossing to the Czech Republic), Column (3) presents all municipalities in the narrow border region (located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic), and Column (4) shows the difference between wider vs. narrow municipalities and respective p-values from a t-test for equal means. Municipalities are matched using mahalanobis distance matching, separately within East vs. West Germany. See Appendix A3.1 for a detailed description of the baseline mahalanobis distance matching algorithm. High-skilled workers have a university degree, medium-skilled workers have completed vocational training, low-skilled workers have no vocational training. FDI establishments are German establishments with affiliates in the Czech Republic. Import and export exposure are measured in 1000 EUR per worker. Treated municipalities are all municipalities located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. Differences in bold signal statistical significance at the 5%-level.

Table B10: Heterogeneity for Unemployment and Wage Effects for West Germany

	(1) Natives Only	(2) Natives+ Immigrants	(3) Part Time	(4) Women	(5) Men	(6) Low-skilled	(7) Medium-skilled	(8) High-skilled	(9) Aged < 29	(10) Aged 30-49	(11) Aged > 50
Panel A: Native Unemployment Rate											
Diff-in-Diff	-0.0072	-0.0070		-0.0015	-0.0057	-0.0027	-0.0043	-0.00054	-0.0023	-0.0027	-0.0020
	(0.0031)**	(0.0029)**		(0.0023)	(0.0024)**	(0.0020)	(0.0022)*	(0.00041)	(0.0018)	(0.0019)	(0.0018)
Observations	5148	5148		5148	5148	5148	5148	5148	5148	5148	5148
Dep. Var Mean in BR 2010	0.095	0.096		0.045	0.050	0.033	0.058	0.0020	0.030	0.038	0.025
Scaled Effect (% of Mean)	-7.57	-7.35		-3.25	-11.4	-8.11	-7.43	-27.2	-7.74	-7.05	-7.81
Muni. FE	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Log Native Full-time Wages											
Diff-in-Diff	0.0022	0.0041	0.023	0.013	0.015	0.044	0.0029	0.0099	0.0077	0.0035	0.0035
	(0.0068)	(0.0068)	(0.021)	(0.013)	(0.0065)**	(0.018)**	(0.0063)	(0.028)	(0.0095)	(0.0085)	(0.0085)
Observations	5148	5148	5040	4844	5140	4168	5138	2728	4914	5100	5100
Dep. Var Mean in BR 2010	4.35	4.35	3.70	4.09	4.43	4.16	4.35	4.84	4.19	4.39	4.39
Scaled Effect (% of Mean)	0.051	0.095	0.62	0.32	0.34	1.05	0.067	0.20	0.18	0.080	0.080
Muni. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each column in this table presents coefficients from a difference-in-differences regression with matched pair × year and municipality fixed effects and standard errors clustered at the municipality level. In each column, the outcome variables are computed for a different sample of native workers in West Germany. All regressions include Bartik-style controls. Diff-in-Diff reports the coefficient on the interaction of a dummy for being located in the border region with a dummy for all years from 2011. I restrict the sample to 2007-2017. Except for column (3), the wage measure in Panel B always refers to full-time wages. Column (1) reports the baseline coefficients (native workers only). Column (2) reports coefficients for a sample of natives and immigrants (including Czech workers). Column (3) reports coefficients for a sample of part-time workers. Column (4) reports coefficients for women, only. Column (5) reports coefficients for men, only. Column (6) reports coefficients for a sample of low-skilled workers (workers without vocational training). Column (7) reports coefficients for a sample of medium-skilled workers (workers with vocational training). Column (8) reports coefficients for a sample of high-skilled workers (workers with a university degree). Column (9) reports coefficients for a sample of workers aged below 29. Column (10) reports coefficients for a sample of workers aged 30-49. Column (11) reports coefficients for a sample of workers aged 50 years or more. *, ** and *** correspond to 10, 5 and 1 percent significance levels, respectively.

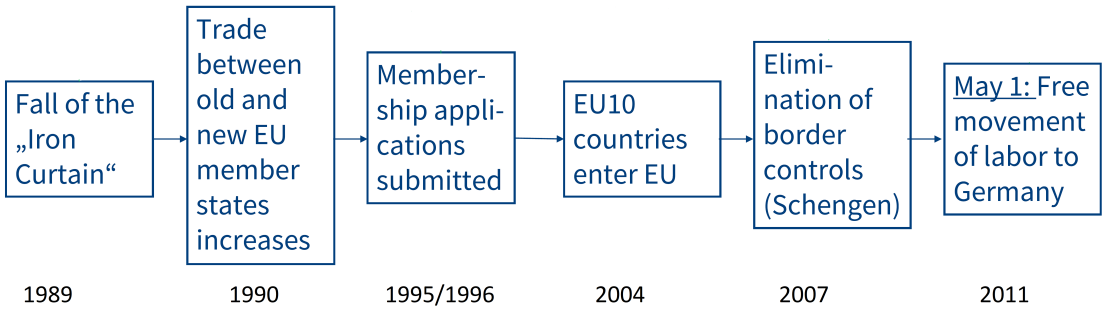
Table B11: Migrant Shares with and without Bartik Employment Control - West Germany

Panel A	(1)	(2)	(3)	(4)	(5)	(6)
	Czech Share		EU8 Share		Migrant Share	
Diff-in-Diff	0.026	0.024	0.023	0.020	0.017	0.013
	(0.0032)***	(0.0038)***	(0.0037)***	(0.0043)***	(0.0053)***	(0.0056)**
Bartik Employment Control		-0.0000013		-0.0000017		-0.0000024
		(0.00000093)		(0.0000013)		(0.0000029)
Observations	5148	5148	5148	5148	5148	5148
Dep. Var Mean in BR 2010	0.013	0.013	0.017	0.017	0.034	0.034
Muni. FE	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel B	Unemployment Rate		Native Employment		Log Native Full-time Wage	
Diff-in-Diff	-0.0078	-0.0070	-0.012	0.0034	0.0017	0.0022
	(0.0028)***	(0.0029)**	(0.015)	(0.016)	(0.0069)	(0.0068)
Bartik Employment Control		0.00000049		0.0000095		
		(0.00000071)		(0.0000040)**		
Bartik Wage Control						-0.34
						(0.22)
Observations	5148	5148	5148	5148	5148	5148
Dep. Var Mean in BR 2010	0.096	0.096	1	1	4.35	4.35
Muni. FE	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The coefficients in this table correspond to the regional event study graphs for West Germany in the main part of the paper, with and without Bartik control. See Appendix Section A1.3 for details on how the Bartik controls are defined. In Panel A, Columns (1)-(2) report coefficients for the share of Czech workers by 2010 employment, Columns (3)-(4) report coefficients for the share of EU8 workers by 2010 employment, and Columns (5)-(6) report coefficients for the share of migrant workers by 2010 employment. In Panel B, Columns (1)-(2) report coefficients for the unemployment rate, Columns (3)-(4) report coefficients for the native employment rate, and Columns (5)-(6) report coefficients for log native full-time wages. *, ** and *** correspond to 10, 5 and 1 percent significance levels, respectively. For the regression equation, see Equation 1 in the paper.

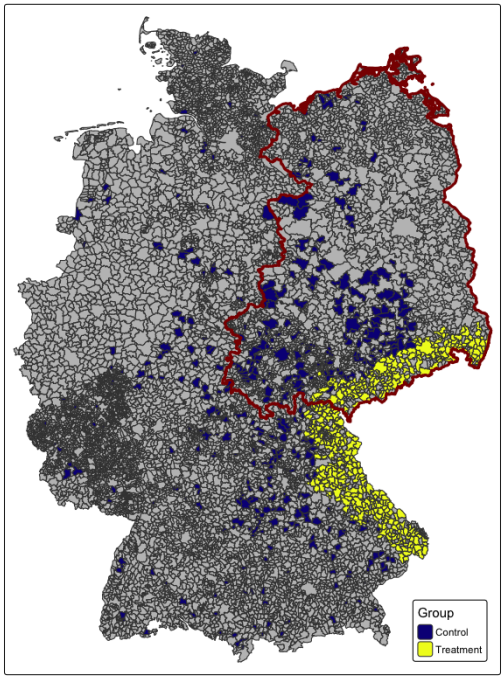
C Appendix Figures - The Czech Republic and Germany

Figure C1: The Eastern Enlargement of the EU: The Process

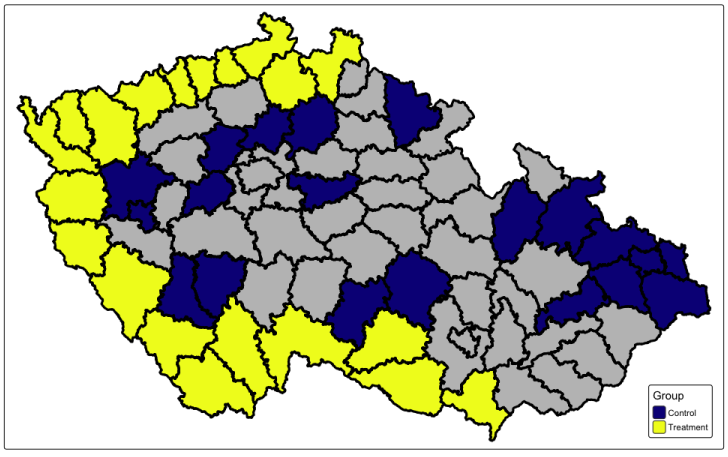


Notes: This figure provides an overview of the Eastern enlargement of the EU in 2004. The process began with the fall of the Iron Curtain in 1989, followed by increasing trade between Western and Eastern EU member states throughout the 1990s. Eastern European countries submitted their membership applications within a relatively short period, between 1995 and 1996. In 2004, ten new countries joined the EU, eight of them from Eastern Europe. The eight Eastern European countries that joined, along with Cyprus and Malta, were the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia. The EU enlargement process was accompanied by open borders under the Schengen Agreement (2007) and the free movement of labor (May 1, 2011, in Germany). Notably, while Germany and Austria delayed the opening of their labor markets until 2011, the UK, Ireland, and Sweden granted immediate access in 2004. They were followed by Spain, Portugal, Finland, Italy, and Greece in 2006; Luxembourg and the Netherlands in 2007; France in 2008; and Belgium and Denmark in 2009.

Figure C2: Matched Treated and Control Regions: Germany and the Czech Republic



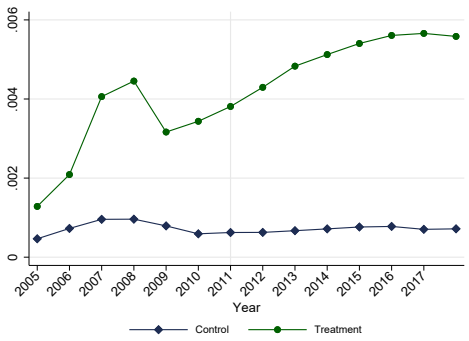
(a) Matched Municipalities, Germany



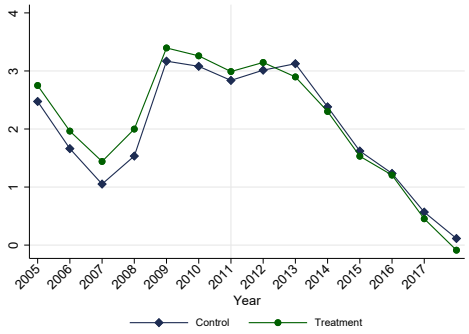
(b) Matched Counties, Czech Republic

Notes: This map displays matched treated and control municipalities in Germany (Panel a) and matched treated and control counties in the Czech Republic (Panel b). In Germany, treated municipalities are those located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. In the Czech Republic, treated counties include all counties bordering either Germany or Austria. In Panel (a), the area outlined by the red line represents East Germany. Regions are matched using Mahalanobis distance matching. See Appendix A3.1 for a detailed description of the baseline Mahalanobis distance matching algorithm.

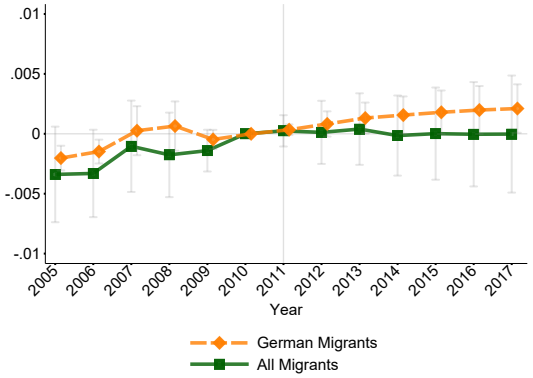
Figure C3: Migrant Share and Job Applicants in the Czech Republic



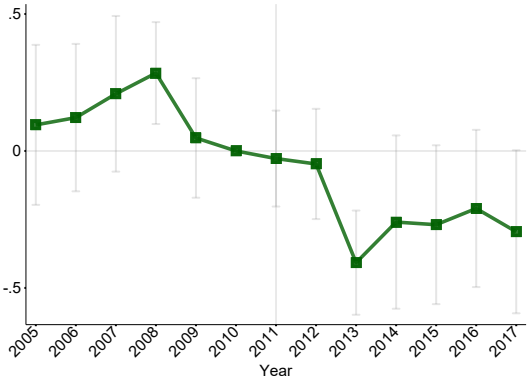
(a) Share of German Residents - Raw Means



(b) Log Applicants per Job - Raw Means



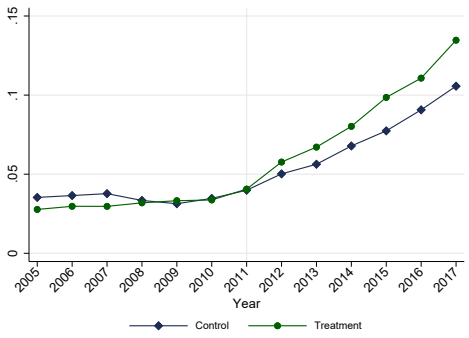
(c) Share of Migrant and German Residents - Event Study



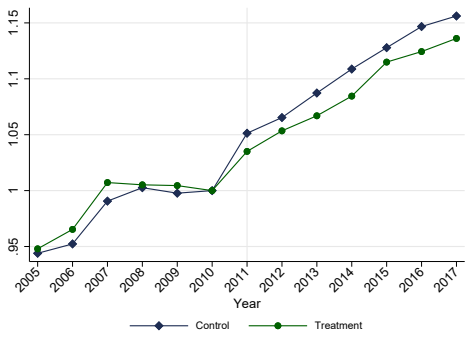
(d) Log Applicants per Job - Event Study

Notes: This figure shows outcomes for Czech border counties compared to matched control counties. Panels (a) and (b) plot raw averages for the share of German residents and log applicants per job, respectively. Panels (c) and (d) plot event study coefficients. Panel (c) reports the change in migrant/German residents relative to the full population in 2010, and Panel (d) reports log applicants per job. All outcomes are recorded on December 31 in a given year. Event study regressions include pair id × year and county fixed effects. Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. The border region includes all counties that share a direct border with Germany or Austria. The German labor market opened for Czech workers in 2011.

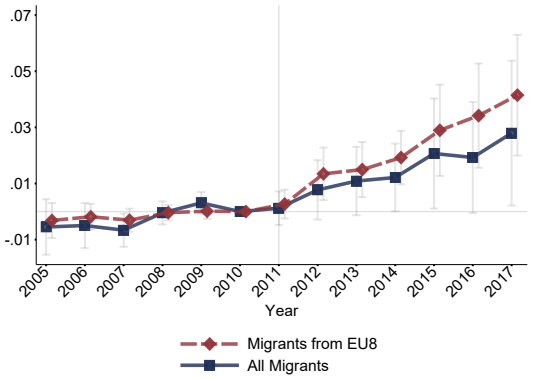
Figure C4: Migrant Shares and Native Employment in West Germany



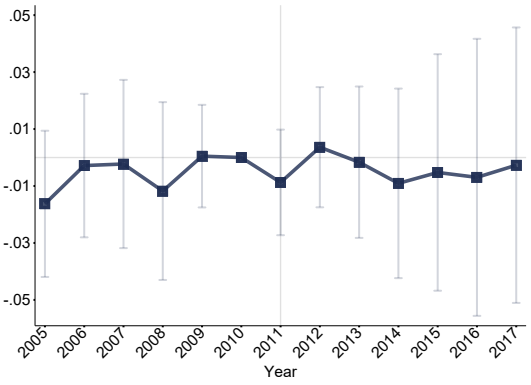
(a) Share of Migrant Workers - Raw Means



(b) Native Employment - Raw Means



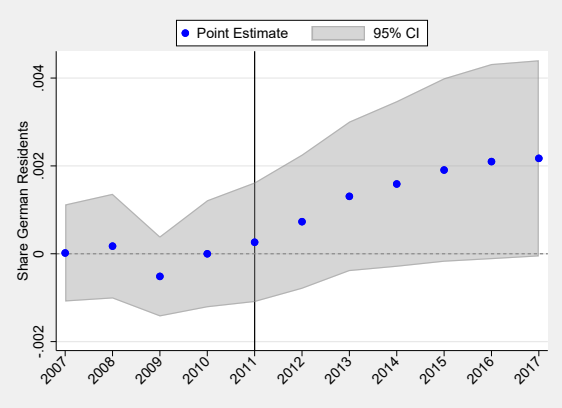
(c) Share of Migrant Workers - Event Study



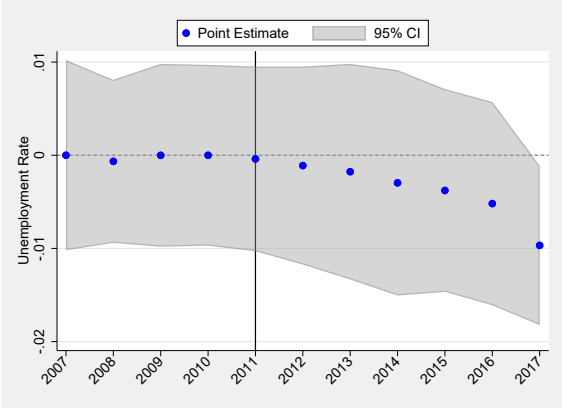
(d) Native Employment - Event Study

Notes: This figure shows outcomes for West German border municipalities compared to matched control municipalities. Panels (a) and (b) plot raw averages for the share of migrant workers and native employment by employment in 2010, respectively. Panels (c) and (d) plot the corresponding event study coefficients. Event study regressions include pair id × year and municipality fixed effects. Event study regressions for Panels (c) and (d) include Bartik-style employment controls (see Appendix Section A1.3 for details). The gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. Treated municipalities are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The German labor market opened to EU8 workers in 2011.

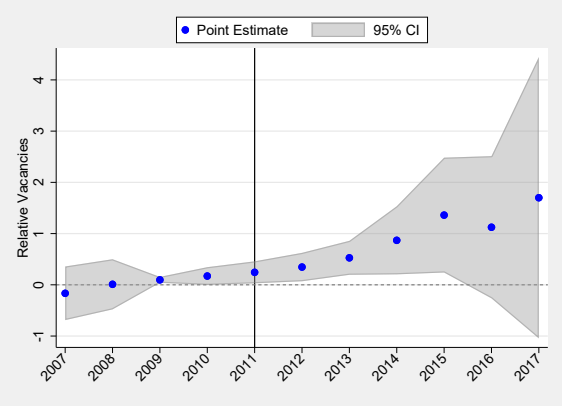
Figure C5: Synthetic Control Group Matching for the Czech Republic



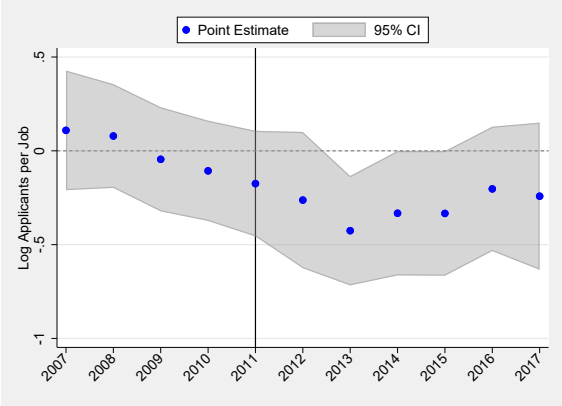
(a) Share of German Residents



(b) Unemployment Rates



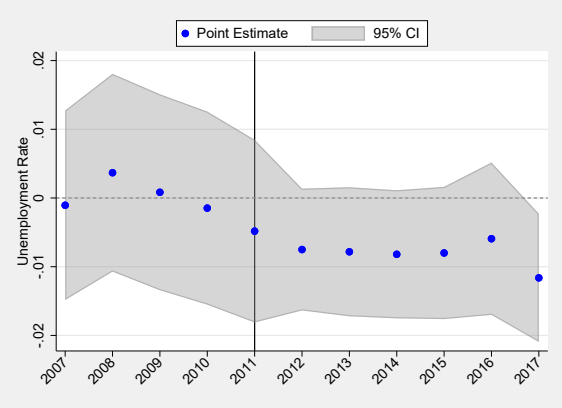
(c) Relative Vacancies



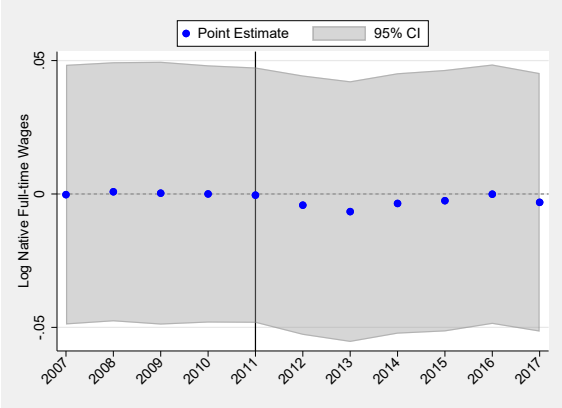
(d) Log Applicants per Job

Notes: This figure shows the impact of out-migration on labor markets in the Czech border counties when using synthetic difference-in-differences estimation. I define the border region to include all counties with a direct border to Germany or Austria. Panel (a) reports the change in German/foreign residents relative to the full population in 2010. Panel (b) reports unemployment rates. Panel (c) reports vacancies relative to the number of vacancies in 2009, and Panel (d) reports log applicants per job. All outcomes are recorded on December 31 in a given year. See Section A3.3 for details on the matching. The German labor market opened for EU8 workers in 2011.

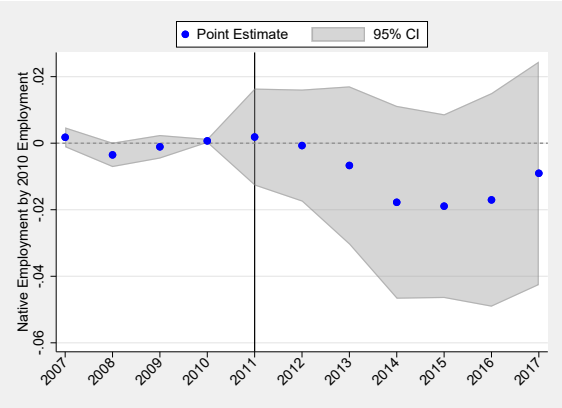
Figure C6: Synthetic Control Group Matching for West Germany - Main Outcomes



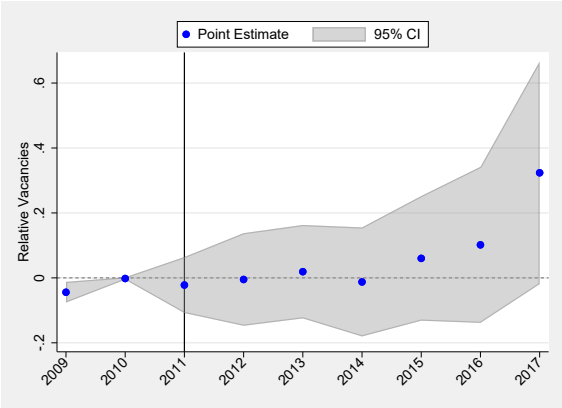
(a) Unemployment Rates



(b) Log Native Full-time Wages



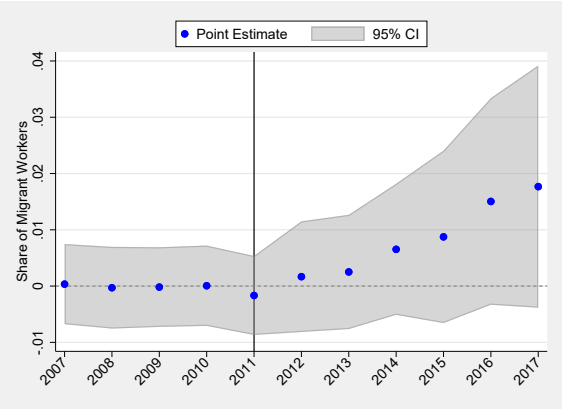
(c) Native Employment



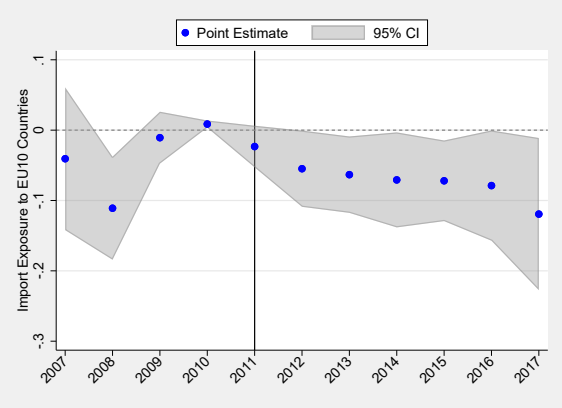
(d) Relative Vacancies

Notes: This figure shows the impact of out-migration on labor markets in West German border counties when using synthetic difference-in-differences estimation. I define the border region as all counties with a border crossing into the Czech Republic; in addition, I include the following towns: Weiden, Regensburg, Straubing, Deggendorf, and Passau. Panel (a) reports unemployment rates. Panel (b) reports log native full-time wages. Panel (c) reports native employment relative to native employment in 2010. Panel (d) reports vacancies relative to vacancies in 2010 (outcome available from 2009, only). See Section A3.3 for details on the matching. The German labor market opened for EU8 workers in 2011.

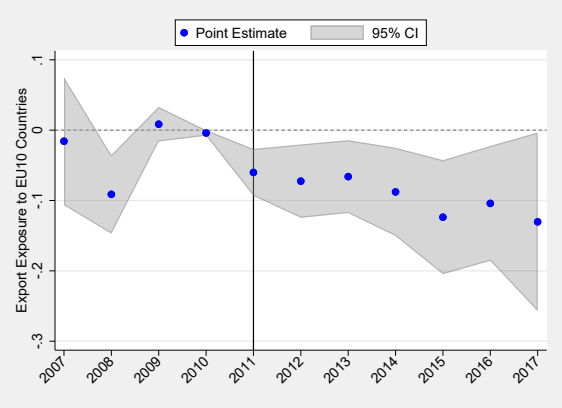
Figure C7: Synthetic Control Group Matching for West Germany - Additional Outcomes



(a) Share of Migrant Workers



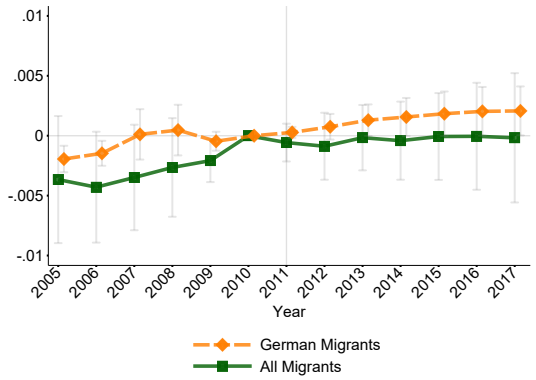
(b) Import Exposure to EU10 Countries



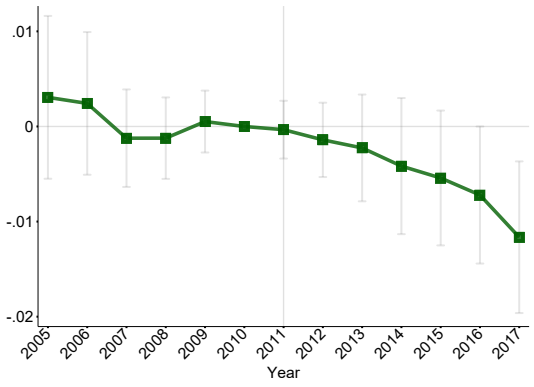
(c) Export Exposure to EU10 Countries

Notes: This figure shows the impact of out-migration on labor markets in West German border counties when using synthetic difference-in-differences estimation. I define the border region as all counties with a border crossing into the Czech Republic; in addition, I include the following towns: Weiden, Regensburg, Straubing, Deggendorf, and Passau. Panel (a) reports the migrant worker share relative to employment in 2010. Panel (b) reports unemployment rates. Panels (b) and (c) report import and export exposure to all countries that entered the EU in 2004 (EU10), respectively. These measures are based on trade data from the UN Comtrade database and are calculated in 1,000 EUR per worker, relative to their value in 2010. See Section A3.3 for details on the matching. The German labor market opened for EU8 workers in 2011.

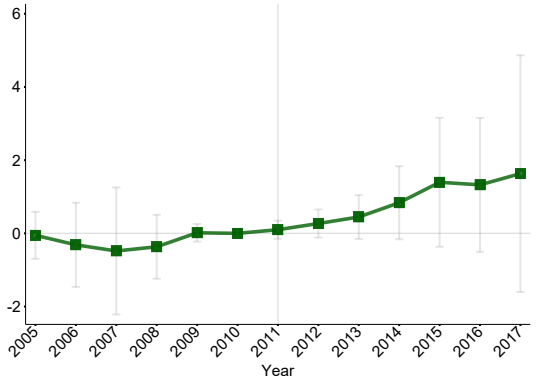
Figure C8: Assigning a Random Control Group Instead of Matching - Czech Republic



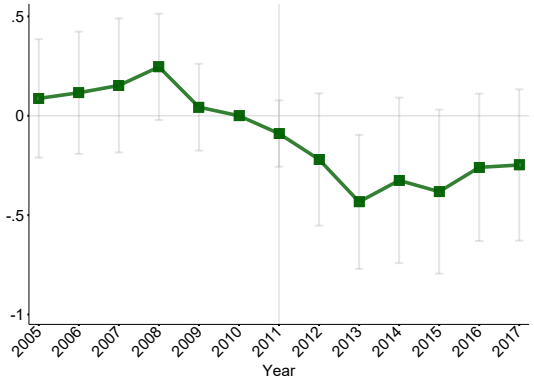
(a) Share of Migrant and German Residents



(b) Unemployment Rates



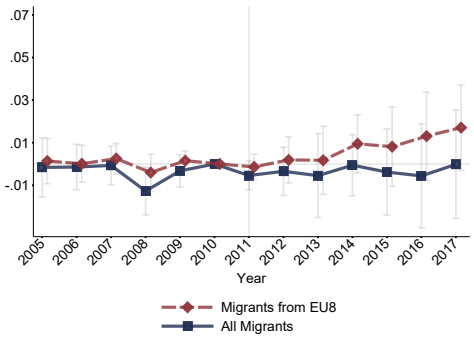
(c) Relative Vacancies



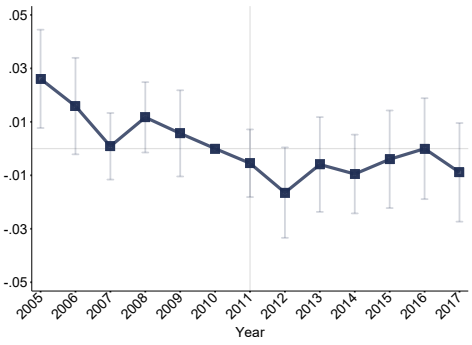
(d) Log Applicants per Job

Notes: This figure shows outcomes for Czech border counties compared to randomly selected control counties. Panel (a) reports the change in migrant/German residents relative to the full population in 2010. Panel (b) reports unemployment rates. Panel (c) reports vacancies relative to the number of vacancies in 2009, and Panel (d) reports log applicants per job. All outcomes are recorded on December 31 in a given year. Event study regressions include pair id $\times$ year and county fixed effects. 95% confidence intervals are derived from standard errors clustered at the county level. The border region includes all counties that share a direct border with Germany or Austria. The German labor market opened for Czech workers in 2011.

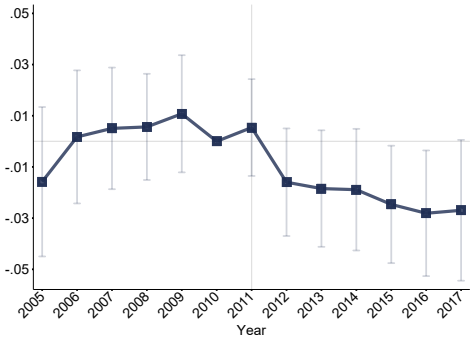
Figure C9: Assigning a Random Control Group Instead of Matching - West Germany



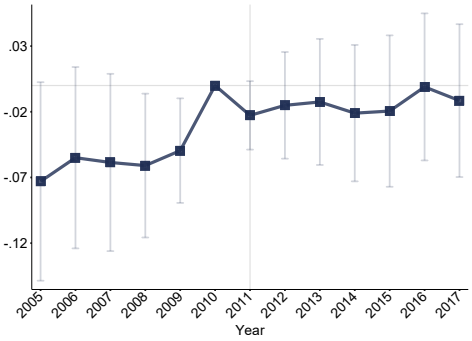
(a) Share of Migrant Workers



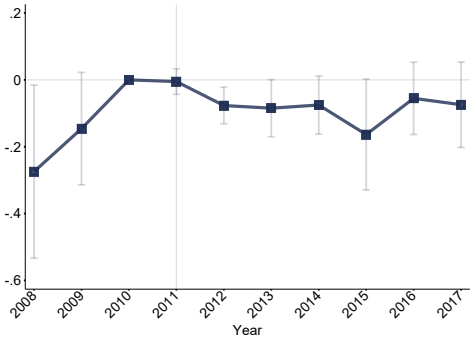
(b) Unemployment Rates



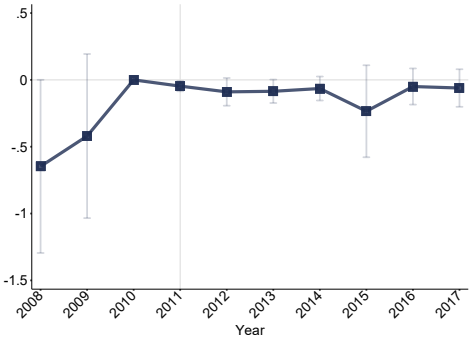
(c) Log Native Full-time Wages



(d) Native Employment by 2010 Employment



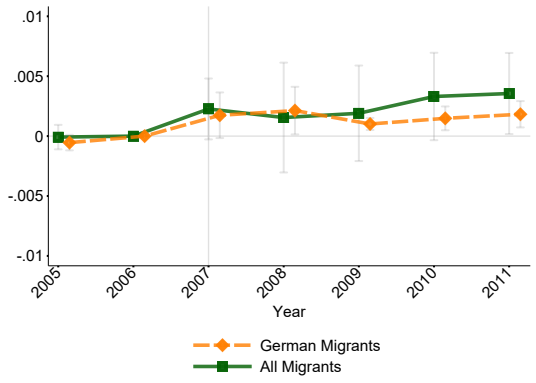
(e) Import Exposure to EU10 Countries



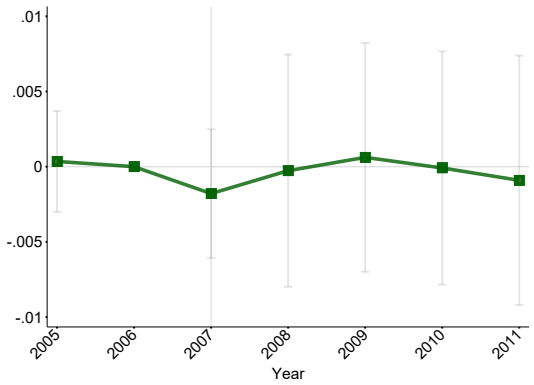
(f) Export Exposure to EU10 Countries

Notes: This figure shows outcomes for West German border municipalities compared to randomly selected control municipalities. Panel (a) reports the inflow of migrant workers from EU8 countries (red diamonds) and all migrant workers (blue squares), relative to employment in 2010. Panel (b) reports unemployment rates, Panel (c) reports log native full-time wages, and Panel (d) reports native employment relative to native employment in 2010. Panels (e) and (f) report import and export exposure to all countries that entered the EU in 2004 (EU10), respectively. These measures are based on trade data from the UN Comtrade database and are calculated in 1,000 EUR per worker, relative to their value in 2010. Event study regressions include pair id × year and municipality fixed effects. Event study regressions for Panels (a)-(d) include Bartik controls (see Appendix Section A1.3 for details). The gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. Treated municipalities are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The German labor market opened to EU8 workers in 2011.

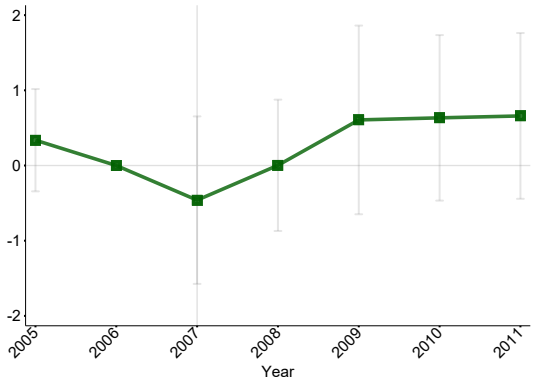
Figure C10: Placebo Treatment Check for Regions in the Czech Republic



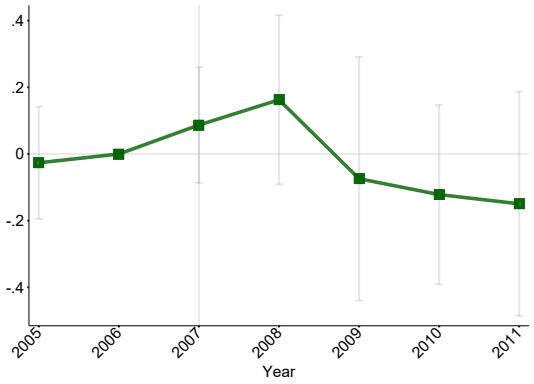
(a) Share of Migrant and German Residents



(b) Unemployment Rates



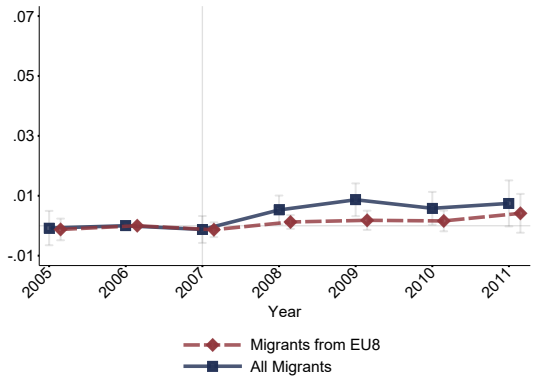
(c) Relative Vacancies



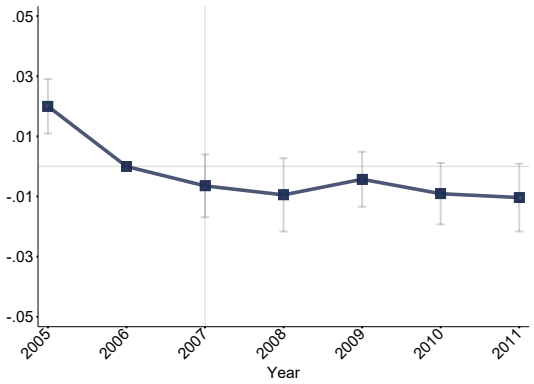
(d) Log Applicants per Job

Notes: This figure presents a placebo treatment test on the labor market effects in the Czech Republic, where I pretend that treatment occurred in 2004 instead of 2011. Panel (a) reports the change in migrant/German residents relative to the full population in 2010. Panel (b) reports unemployment rates. Panel (c) reports vacancies relative to the number of vacancies in 2009, and Panel (d) reports log applicants per job. All outcomes are recorded on December 31 in a given year. Event study regressions include pair id × year and county fixed effects. Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. The border region includes all counties that share a direct border with Germany or Austria. The German labor market opened for Czech workers in 2011.

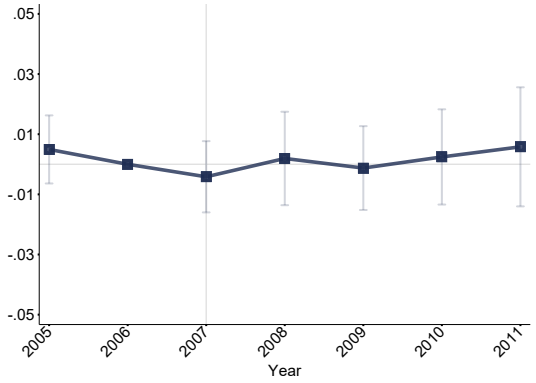
Figure C11: Placebo Treatment Check for Regions in West Germany



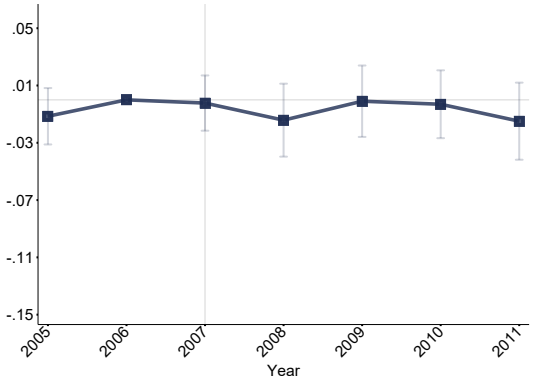
(a) Share of Migrant Workers



(b) Unemployment Rates



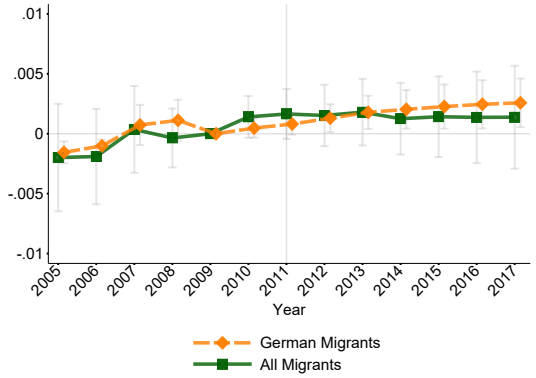
(c) Log Native Full-time Wages



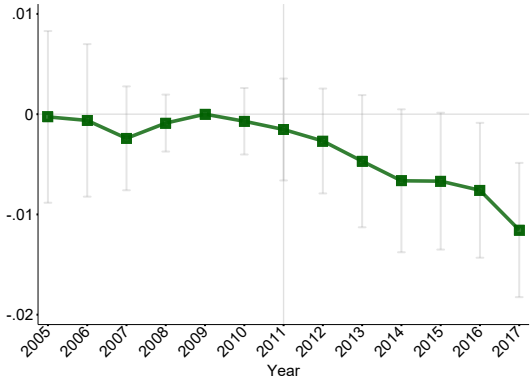
(d) Native Employment

Notes: This figure presents a placebo treatment test on the labor market effects in West Germany, where I pretend that treatment occurred in 2004 instead of 2011. Regressions are based on my baseline sample of matched municipalities. I show event study coefficients for the main regional outcome variables: Migrant worker shares by 2010 employment (Panel a), unemployment rates (Panel b), log native full-time wages (Panel c), and native employment by 2010 native employment (Panel d). Event study regressions include matched pair id × year and municipality fixed effects. Event study regressions include pair id × year and municipality fixed effects. Event study regressions for Panels (a)-(d) include Bartik controls (see Appendix Section A1.3 for details). Treated municipalities are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. The German labor market opened to EU8 workers in 2011.

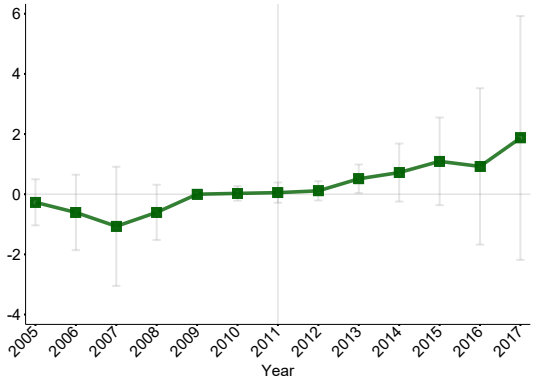
Figure C12: Labor Market Effects in the Czech Republic - Omitting 2009



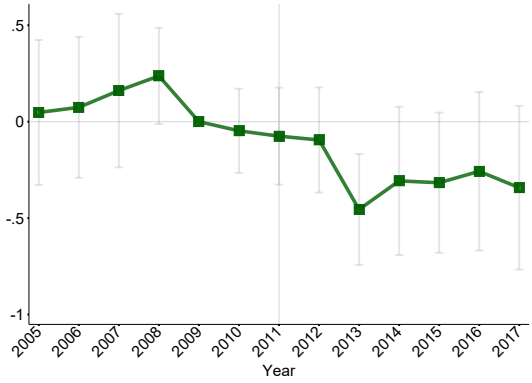
(a) Share of Migrant and German Residents



(b) Unemployment Rates



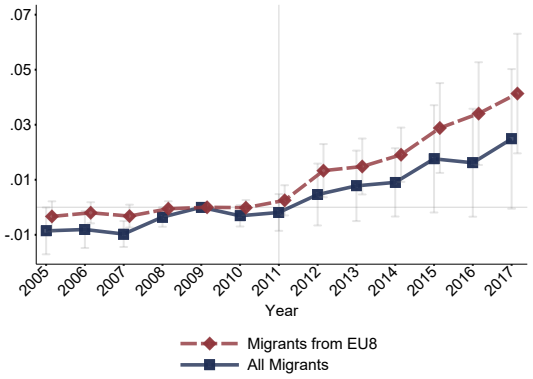
(c) Relative Vacancies



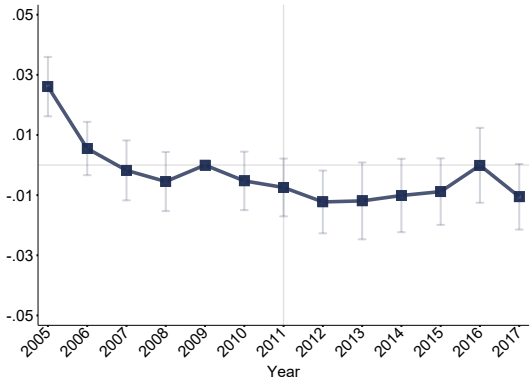
(d) Log Applicants per Job

Notes: This figure shows outcomes for Czech border counties compared to matched control counties. I omit 2009 instead of 2010 as the reference year. Panel (a) reports the change in migrant/German residents relative to the full population in 2010. Panel (b) reports unemployment rates. Panel (c) reports vacancies relative to the number of vacancies in 2009, and Panel (d) reports log applicants per job. All outcomes are recorded on December 31 in a given year. Event study regressions include pair id × year and county fixed effects. 95% confidence intervals are derived from standard errors clustered at the county level. The border region includes all counties that share a direct border with Germany or Austria. The German labor market opened for Czech workers in 2011.

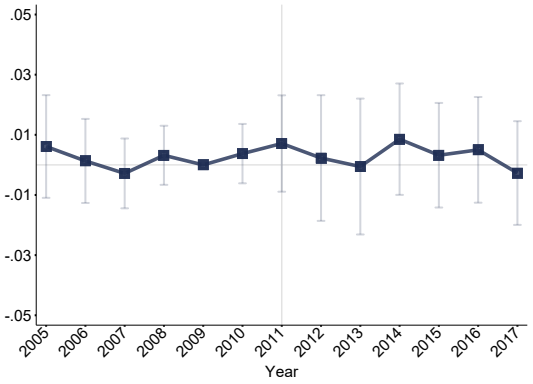
Figure C13: Labor Market Effects in West Germany - Omitting 2009



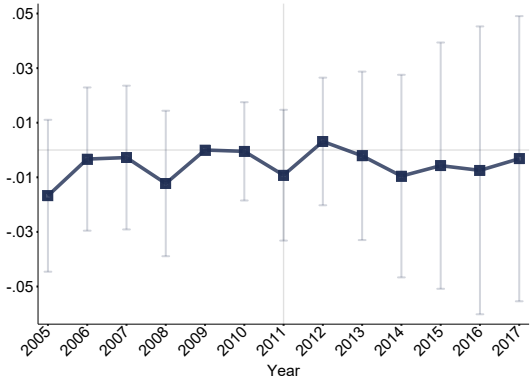
(a) Share of Migrant Workers



(b) Unemployment Rates



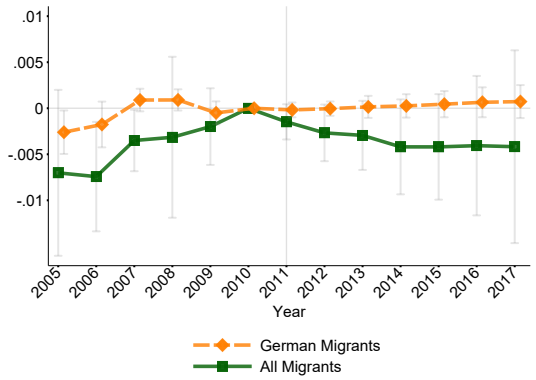
(c) Native Full-time Wages



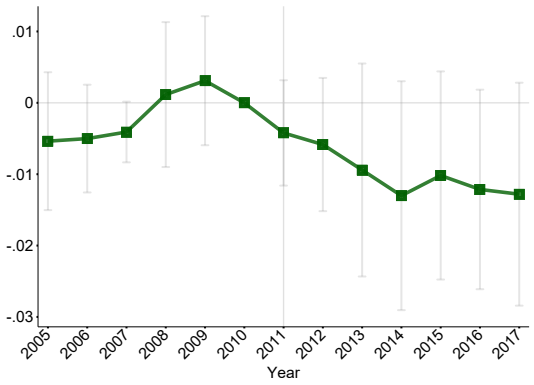
(d) Native Employment by 2010 Employment

Notes: This figure shows outcomes for West German border municipalities compared to matched control municipalities. I omit 2009 instead of 2010 as the reference year. Panel (a) reports the inflow of migrant workers from EU8 countries (red diamonds) and all migrant workers (blue squares), relative to employment in 2010. Panel (b) reports unemployment rates, Panel (c) reports log native full-time wages, and Panel (d) reports native employment relative to native employment in 2010. Event study regressions include pair id × year and municipality fixed effects. Event study regressions for Panels (a)-(d) include Bartik controls (see Appendix Section A1.3 for details). The gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. Treated municipalities are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The German labor market opened to EU8 workers in 2011.

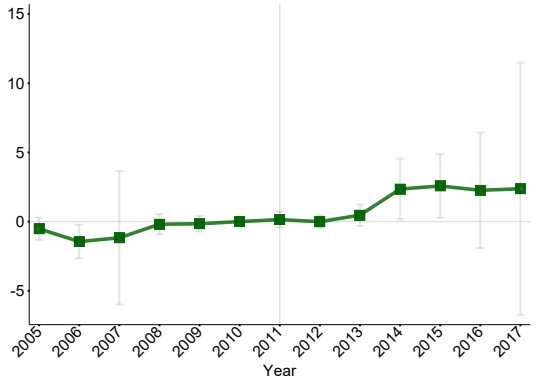
Figure C14: Labor Market Effects in the Czech Republic for Regions Bordering West Germany



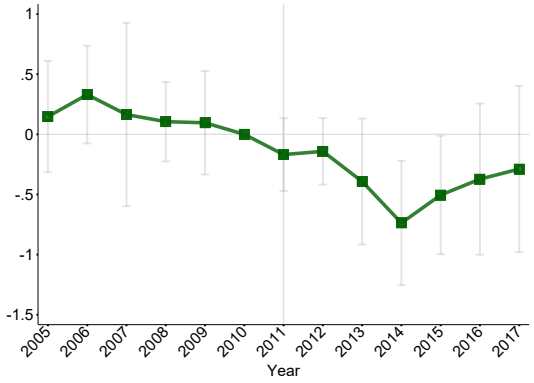
(a) Share of Migrant and German Residents



(b) Unemployment Rates



(c) Relative Vacancies

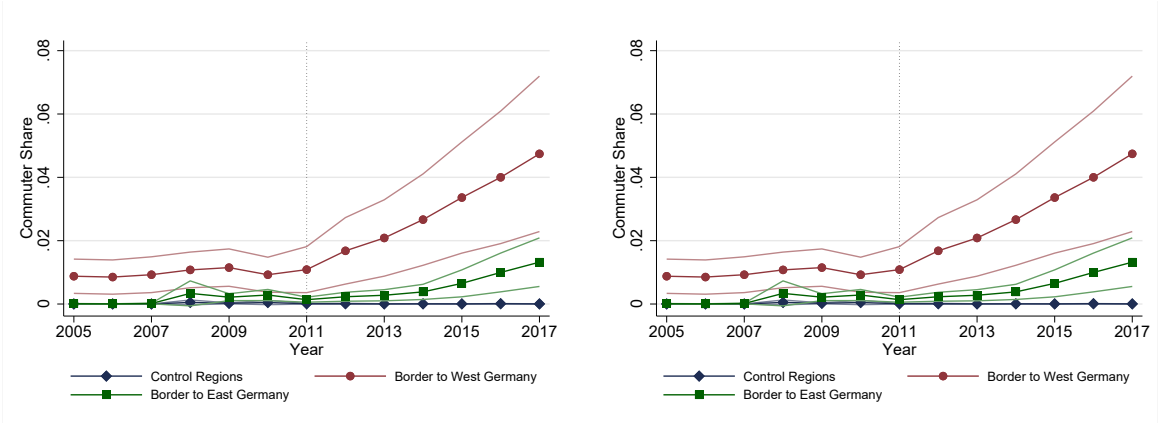


(d) Log Applicants per Job

Notes: This figure replicates my main results on local labor markets for a sample of regions bordering West Germany (i.e. Bavaria), only. Panel (a) reports the change in migrant/German residents relative to the full population in 2010. Panel (b) reports unemployment rates. Panel (c) reports vacancies relative to the number of vacancies in 2009, and Panel (d) reports log applicants per job. All outcomes are recorded on December 31 in a given year. Event study regressions include pair id × year and county fixed effects. 95% confidence intervals are derived from standard errors clustered at the county level. The border region includes all counties that share a direct border with Germany or Austria. The German labor market opened for Czech workers in 2011.

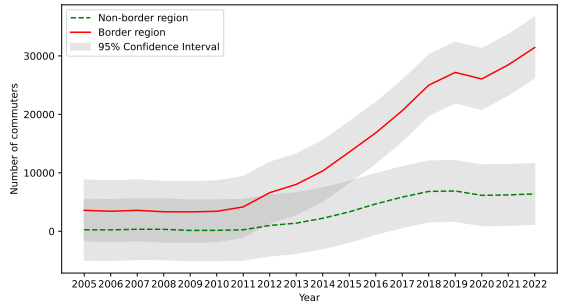
D Appendix Figures - The Czech Republic

Figure D1: The Outflow of Czech Workers from the Czech Republic: Descriptives

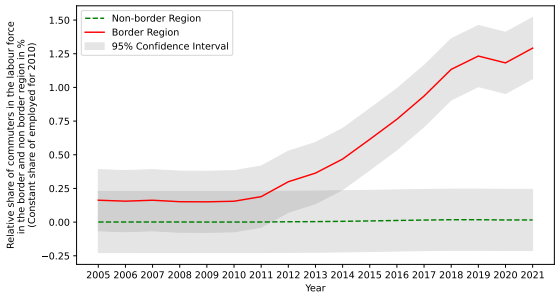


(a) Czech Commuters by Working Age Population in the Czech Republic

(b) Czech Commuters by Male Working Age Population in the Czech Republic



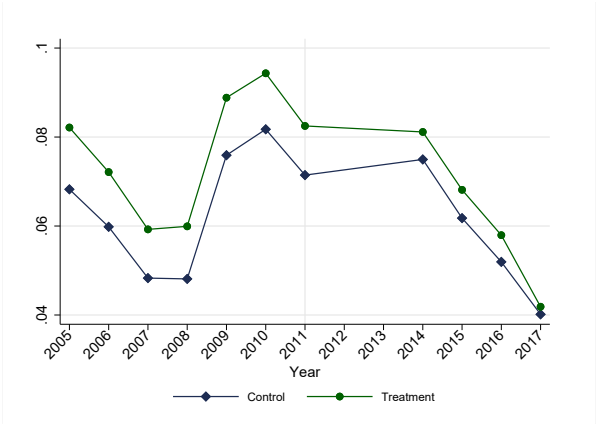
(c) Czech Commuters in Germany



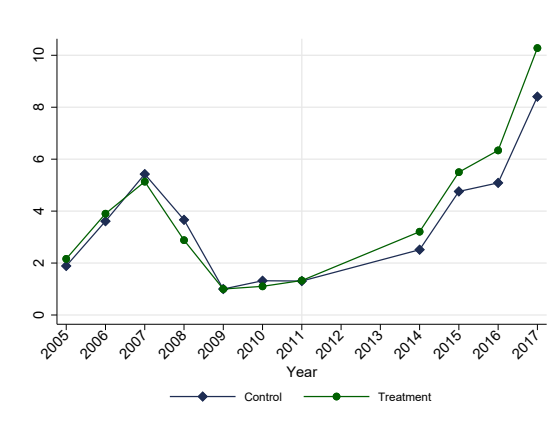
(d) Share of Czech Commuters by Working Age Population in Germany

Notes: This figure gives an intuition on the magnitude of the Czech commuter outflow relative to the Czech working age population in 2010 (Panels (a) and (b)). It moreover shows the full inflow of Czech commuters to Germany (Panels (c) and (d)). Panel (a) combines German data provided by the Federal Employment Agency on Czech commuters by county and data provided by the Czech Statistical Office on the working age population and emigration flows to Germany by county. It plots the sum of Czech commuters in adjacent German border counties plus emigrants to Germany by the working age population in a given Czech county in 2010. For this, I make the assumption that Czechs are most likely to commute to the German county directly bordering their origin county. Panel (b) shows the same measure, where the denominator restricts the working age population to Czech men. Panel (c) uses German data provided by the Federal Employment Agency to show the inflow of Czech commuters over time in levels. Panel (d) combines this commuter data with data provided by the German Statistical Office (Destatis) to show the share of Czech commuters by the total working age population in 2010. Commuters in the German data are defined as workers with a workplace in Germany and registered residence abroad. For the definition of German border counties, see Figure E14.

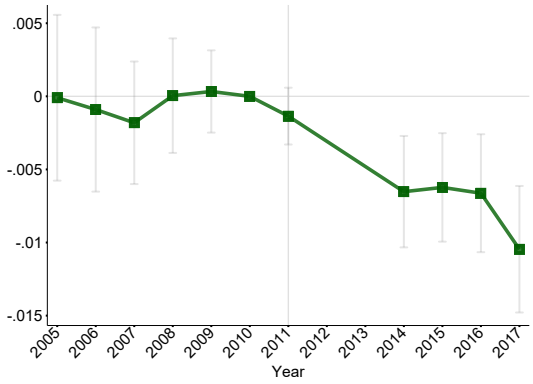
Figure D2: The Impact of Out-Migration on Czech Municipalities



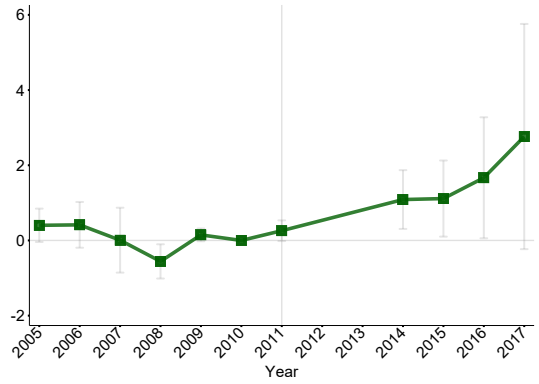
(a) Unemployment Rates - Raw Averages



(b) Relative Vacancies



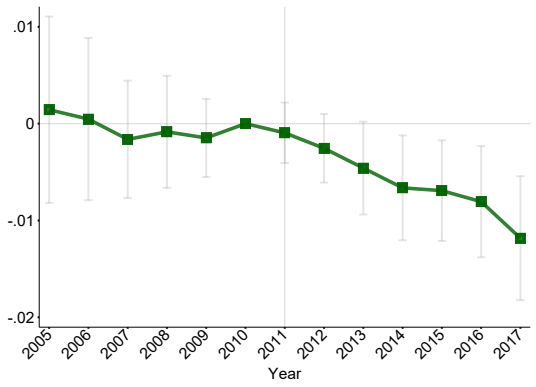
(c) Unemployment Rates



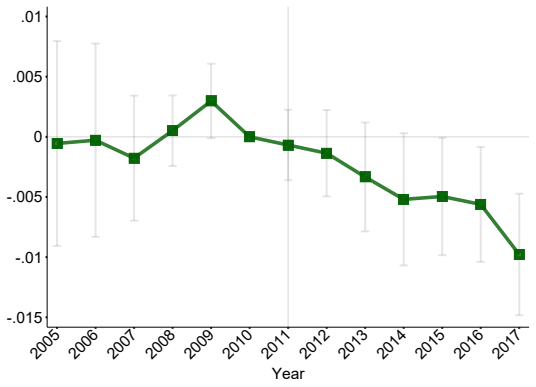
(d) Relative Vacancies

Notes: This figure shows the impact of out-migration on municipalities in the Czech border region compared to matched controls. I define the border region to include all municipalities located in a county with a direct border to Germany or Austria. Panels (a) and (b) report raw means for unemployment rates and vacancies relative to vacancies in 2009. Panels (c) and (d) report the corresponding event study coefficients. All outcomes are recorded on December 31 in a given year. Data for 2012/2013 are missing due to a data revision. Event study regressions include pair id $\times$ year and county fixed effects. 95% confidence intervals are derived from standard errors clustered at the county level. The German labor market opened for Czech workers in 2011.

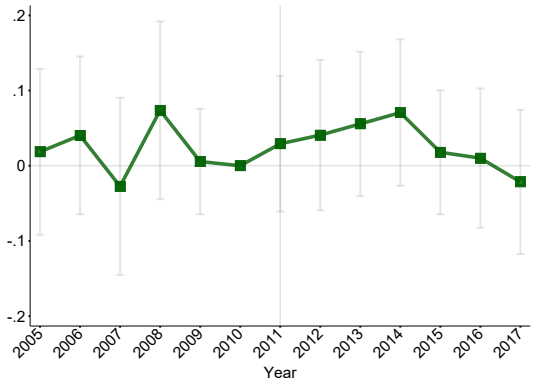
Figure D3: Additional Labor Market Outcomes for Czech Counties



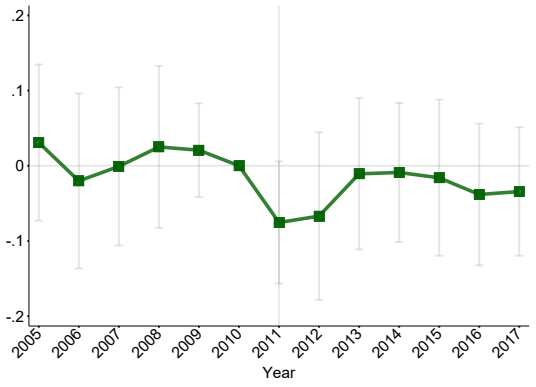
(a) Unemployment Rate - Men



(b) Unemployment Rate - Women



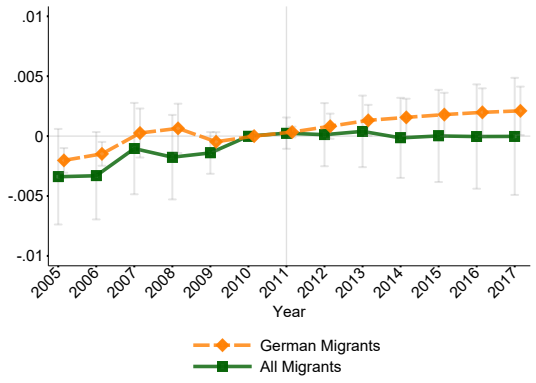
(c) Log Outflows



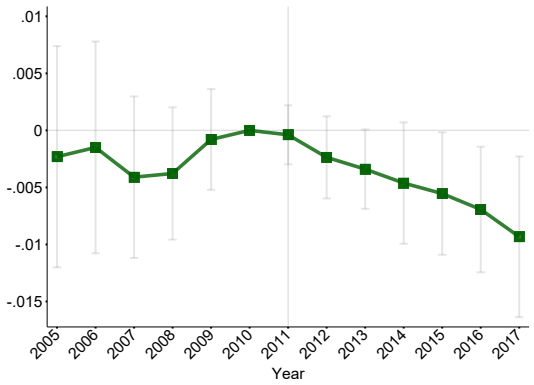
(d) Log Inflows

Notes: This figure shows additional outcomes for Czech border counties compared to matched control counties. Panels (a) and (b) report unemployment rates for men and women, respectively. Panel (c) reports log population outflows, and Panel (d) reports log population inflows. Event study regressions include pair id × year and county fixed effects. Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. The border region includes all counties that share a direct border with Germany or Austria. The German labor market opened for Czech workers in 2011.

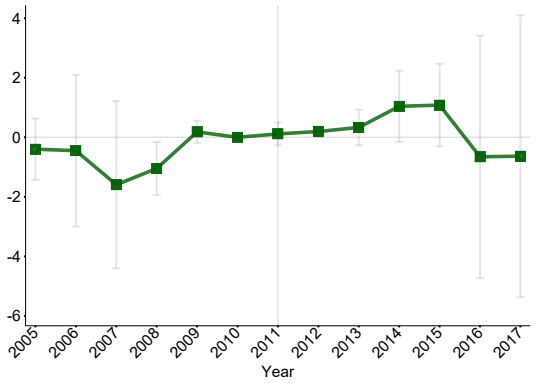
Figure D4: Labor Market Effects on Czech Counties - Reweighted



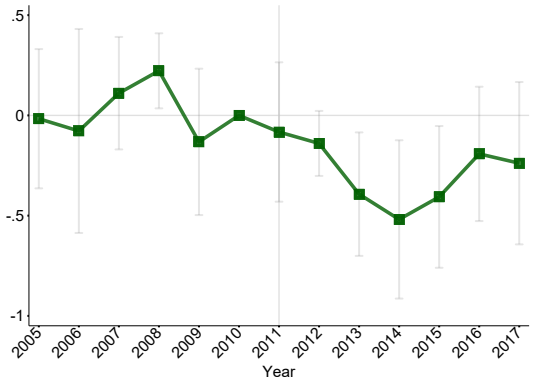
(a) Share of Migrant and German Residents



(b) Unemployment Rates



(c) Relative Vacancies

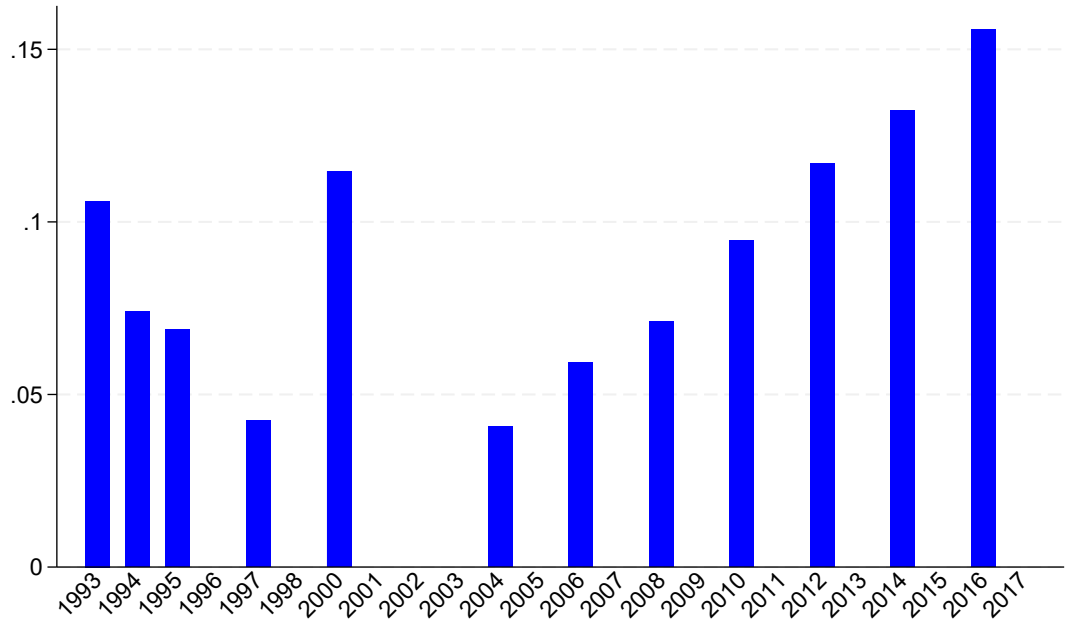


(d) Log Applicants per Job

Notes: This figure shows outcomes for Czech border counties compared to matched control counties. I reweight Czech border counties to Czech control counties using inverse probability weighting on the industry composition in 2010. Panel (a) reports the change in migrant/German residents relative to the full population in 2010. Panel (b) reports unemployment rates. Panel (c) reports vacancies relative to the number of vacancies in 2009, and Panel (d) reports log applicants per job. All outcomes are recorded on December 31 in a given year. Event study regressions include pair id × year and county fixed effects. 95% confidence intervals are derived from standard errors clustered at the county level. The border region includes all counties that share a direct border with Germany or Austria. The German labor market opened for Czech workers in 2011.

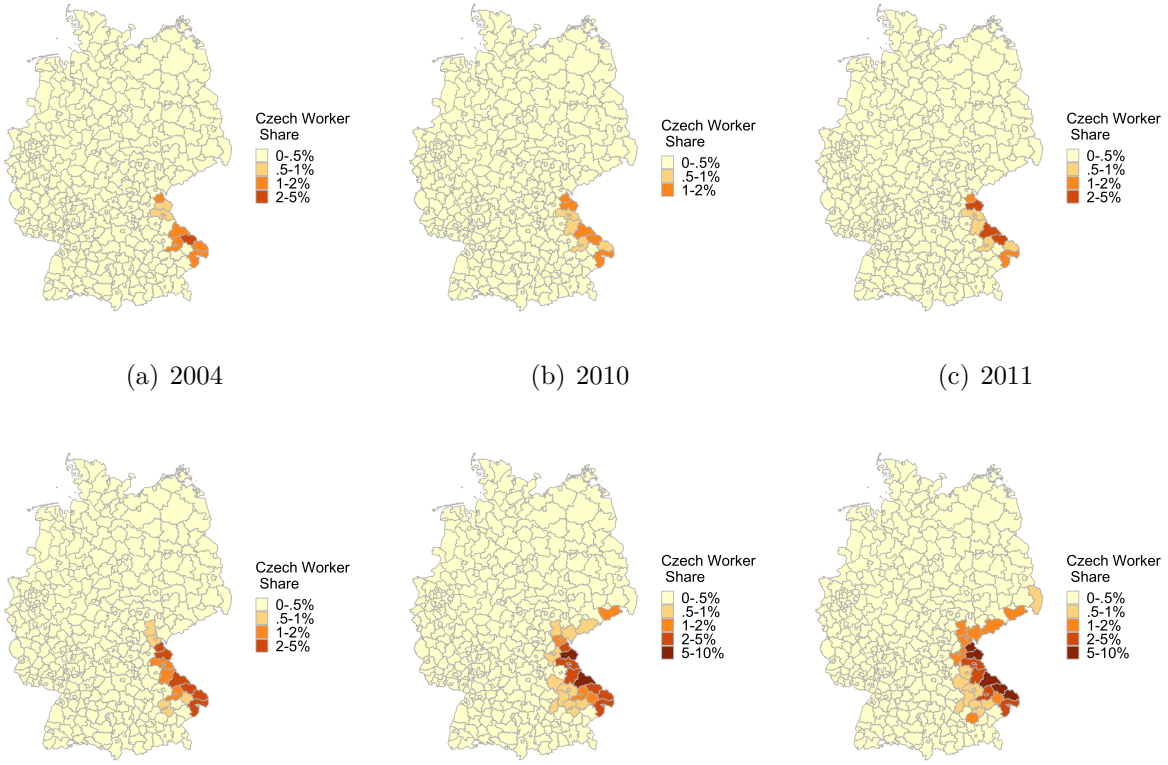
E Appendix Figures - Germany

Figure E1: Share of Firms Reporting Labor Shortages in Establishment Survey



Notes: This figure plots the share of firms in the IAB's establishment survey for all of Germany that report that they experienced labor shortages in a given year. In missing years, the respective question was not part of the survey. See (Bächmann et al., 2023) for more details on the survey.

Figure E2: The Geographic Distribution of Czech Workers in Germany

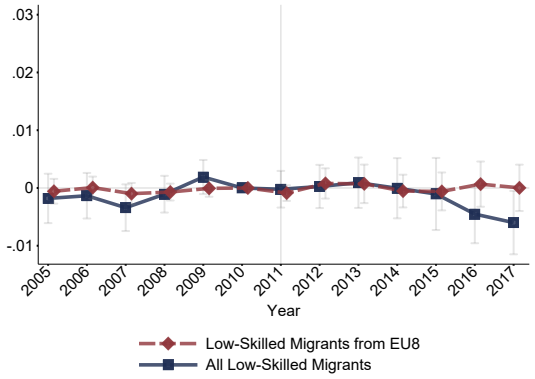


(a) 2004 (b) 2010 (c) 2011

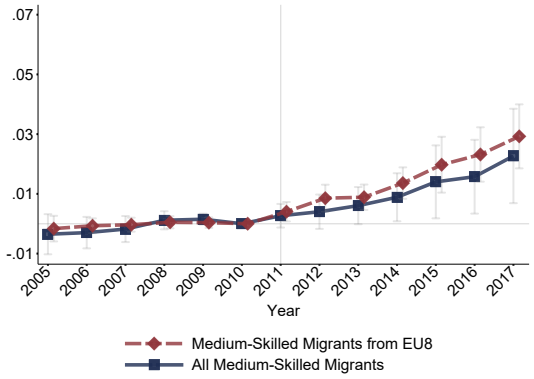
(d) 2013 (e) 2015 (f) 2017

Notes: This figure shows the geographic distribution of Czech workers across Germany. Each map plots different categories for the share of Czech workers by 2010 employment. The geographic unit is counties (NUTS-3).

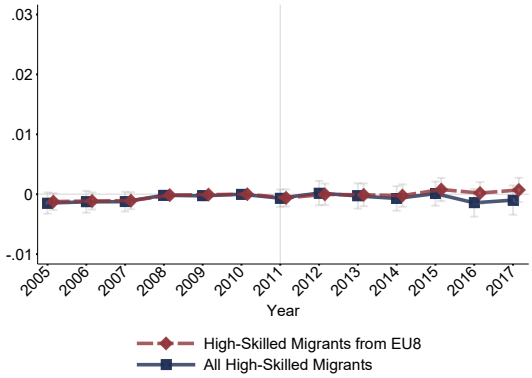
Figure E3: The Inflow of Migrant Workers by Skill Group to West Germany



(a) Share of Low-Skilled Migrant Workers



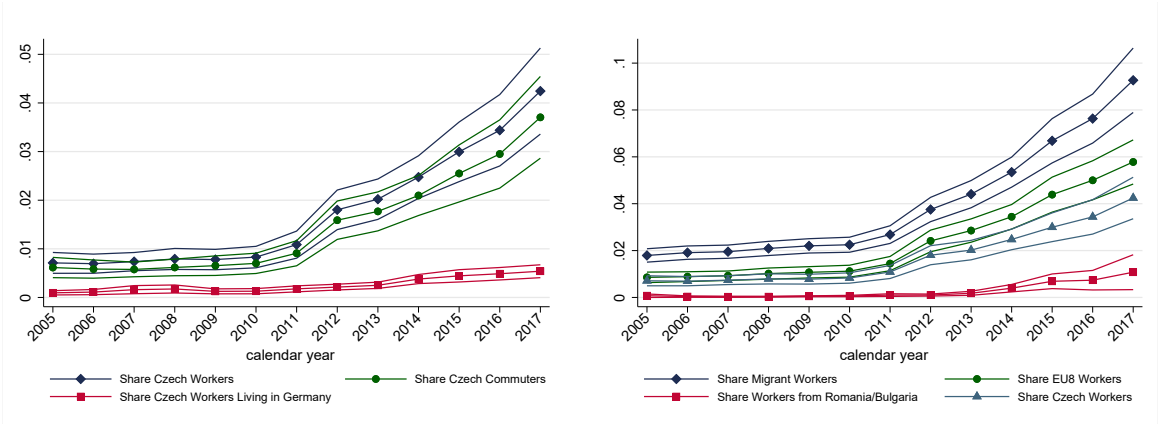
(b) Share of Medium-Skilled Migrant Workers



(c) Share of High-Skilled Migrant Workers

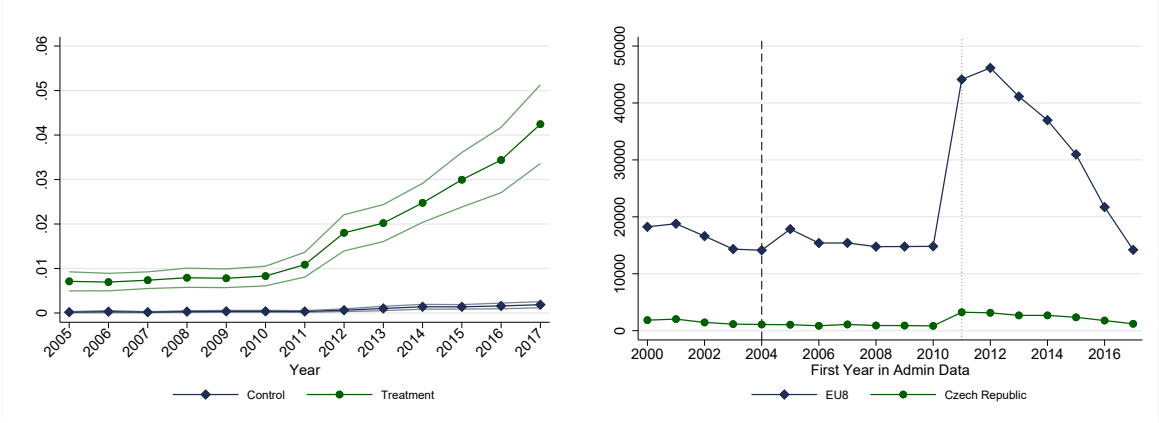
Notes: This figure shows the inflow of migrant workers by skill group to the West German border region compared to matched controls. Panel (a) reports event study coefficients on the differential inflow of low-skilled migrant/EU8 workers to treated municipalities vs. matched control municipalities, and Panels (b) and (c) plot the same for medium-skilled and high-skilled migrant workers, respectively. I compute all shares relative to employment in 2010. Event study regressions include matched pair id × year and municipality fixed effects, and Bartik-style employment controls. The gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. Low-skilled workers have no vocational training, medium-skilled workers have vocational training, and high-skilled workers have a university degree. Treated municipalities are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The German labor market opened to EU8 workers in 2011.

Figure E4: The Czech Worker Inflow to Germany: Descriptives



(a) Share of Czech Workers by Place of Living

(b) Inflow of Migrant Workers by Selected Origin Group

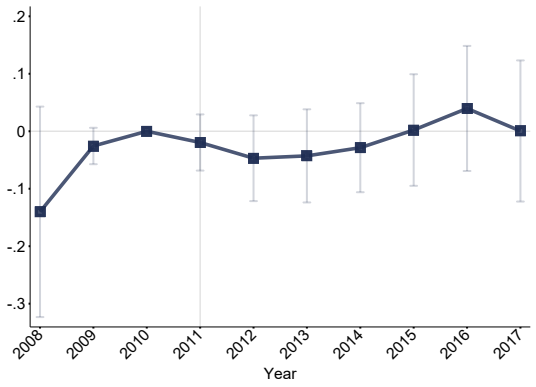


(c) Raw Share of Czech Workers: Border Region vs. Matched Controls

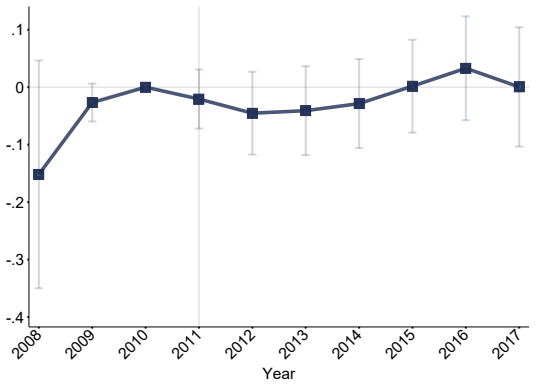
(d) Inflow of EU8 and Czech Workers to Germany by Year of First Entry

Notes: This figure presents descriptive evidence on the migrant worker inflow following the 2011 EU enlargement. Panel (a) plots the share of Czech workers by 2010 employment in the border region for i) all Czech workers (blue diamonds), ii) all Czechs which are reported to "live abroad" (green circles), and iii) all Czechs with a residence in Germany (red squares). Panel (b) plots i) the share of all migrant workers (blue diamonds), ii) the share of EU8 workers (green circles), iii) the share of Czech workers (cyan triangles), and iv) the share of workers from Romania/Bulgaria (red squares) in the border region. Note that the free movement policy for Romanians/Bulgarians started in 2014. In Panel (c), I present raw means of the share of Czech workers to the border region (green circles) vs. matched control municipalities (blue diamonds). The border region consists of municipalities that are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. Panel (d) plots the numbers of EU8/Czech workers entering Germany by the first year they were recorded in the German social-security data. Data is based on June 30 information in the 10% sample of the social-security records.

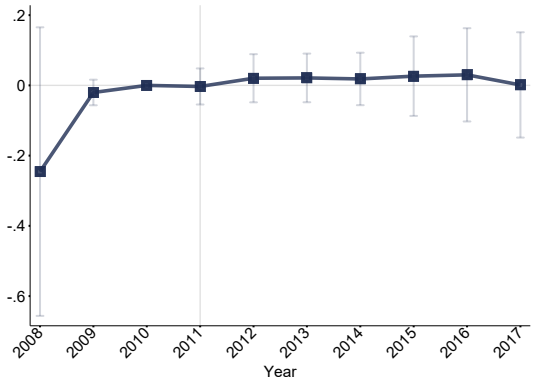
Figure E5: Import and Export Exposure for West Germany



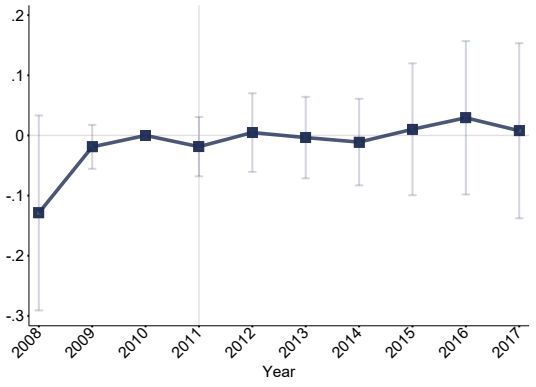
(a) Import Exposure to the Czech Republic



(b) Import Exposure to all EU10 Countries



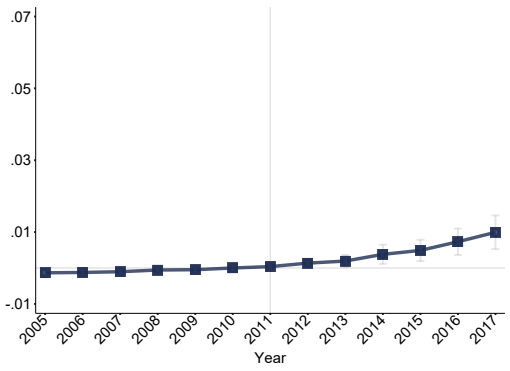
(c) Export Exposure to the Czech Republic



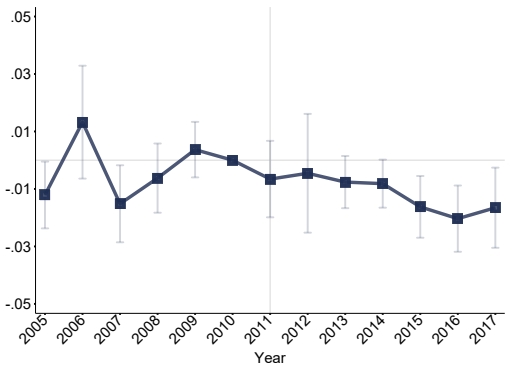
(d) Export Exposure to all EU10 Countries

Notes: This figure shows import and export exposure of treated vs. control municipalities in West Germany. Panels (a) and (b) report import exposure to the Czech Republic and to all countries that entered the EU in 2004 (EU10), respectively. Panels (c) and (d) report export exposure. Import and export exposure are based on trade data from the UN Comtrade database and are calculated in 1,000 EUR per worker. The graphs report import/export exposure relative to their value in 2010. Event study regressions include matched pair id × year and municipality fixed effects. The gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. Treated municipalities are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The German labor market opened to EU8 workers in 2011.

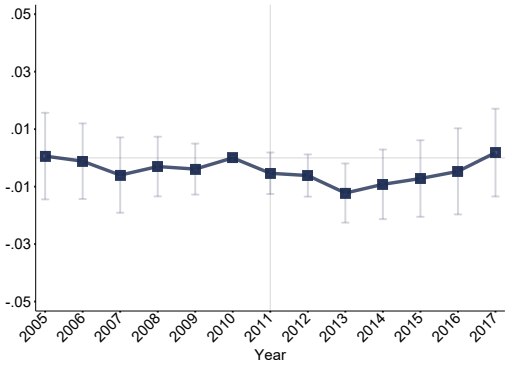
Figure E6: Main Results for East Germany



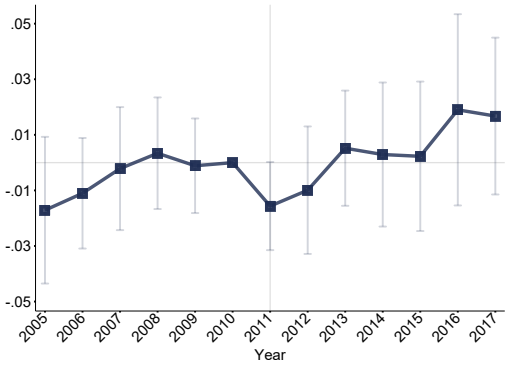
(a) Share of Czech Workers



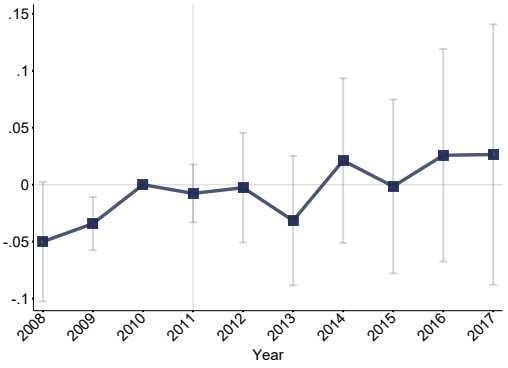
(b) Unemployment Rates



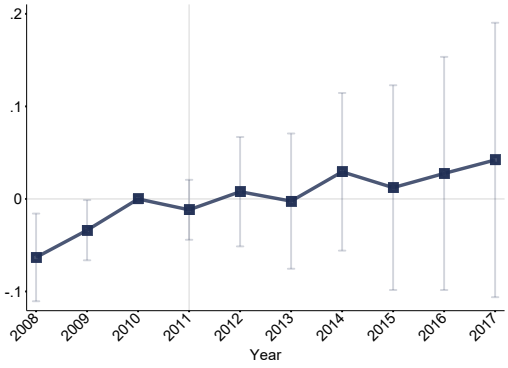
(c) Native Full-time Wages



(d) Native Employment by 2010 Employment



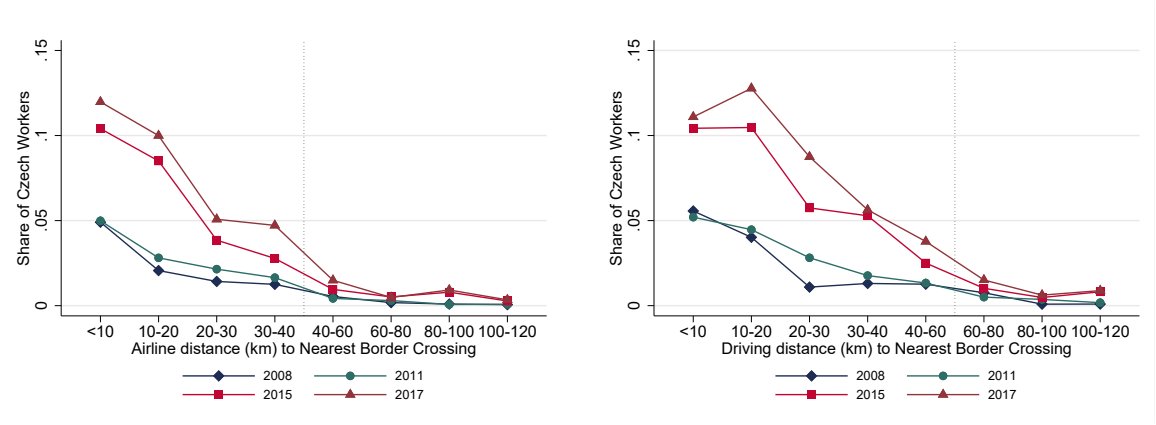
(e) Import Exposure to all EU10 Countries



(f) Export Exposure to all EU10 Countries

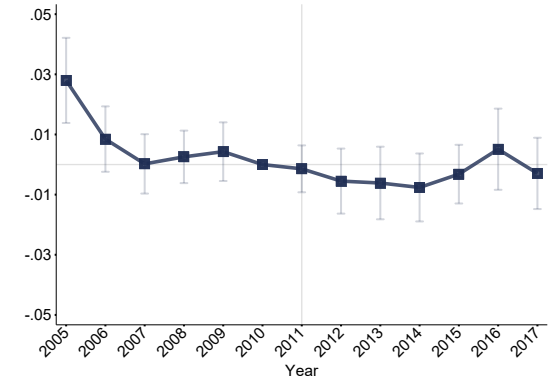
Notes: This figure shows the Czech worker inflow and its impact on municipalities in East Germany. Panel (a) reports event study coefficients on the differential inflow of Czech workers to treated municipalities vs. matched control municipalities. Panels (b)-(d) present unemployment rates, log full-time wages, and native employment shares, respectively. I compute all shares relative to employment in 2010. Figures (e) and (f) present import and export exposure to all countries that joined the EU in 2004, respectively. Import and export exposure are based on trade data from the UN Comtrade database and are calculated in 1,000 EUR per worker. The graphs report import/export exposure relative to their value in 2010. Event study regressions include matched pair id × year and municipality fixed effects. Event study regressions for Panels (a)-(d) include Bartik controls (see Appendix Section A1.3 for details). The gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. Treated municipalities are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The German labor market opened to EU8 workers in 2011.

Figure E7: Alternative Treatment Group Definitions for West Germany

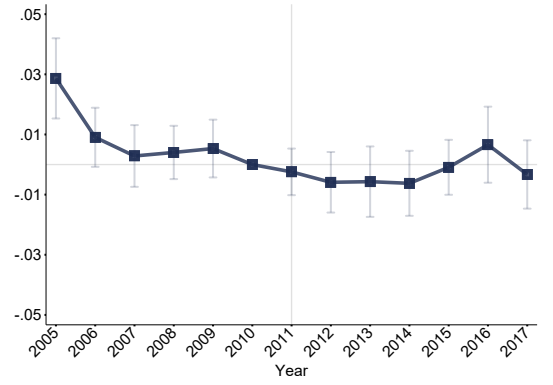


(a) Czech Workers by Airline Distance (km)

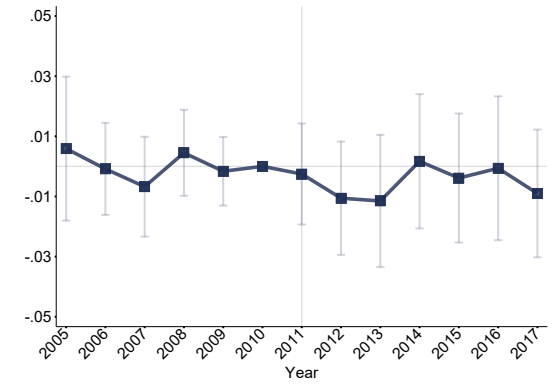
(b) Czech Workers by Driving Distance (km)



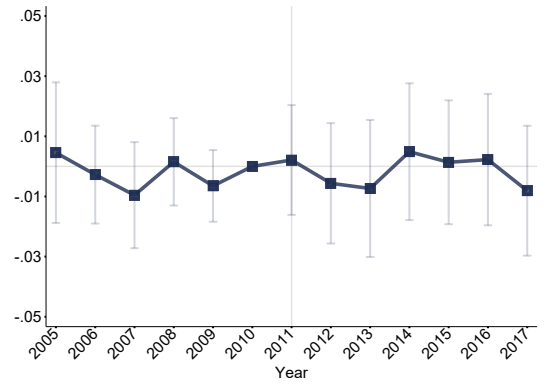
(c) Unemployment Rates - Airline Distance



(d) Unemployment Rates - Driving Distance



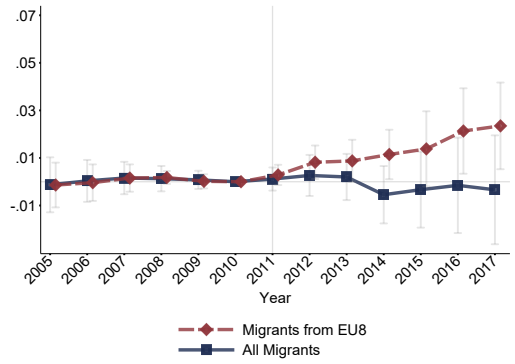
(e) Native Full-time Wages - Airline Distance



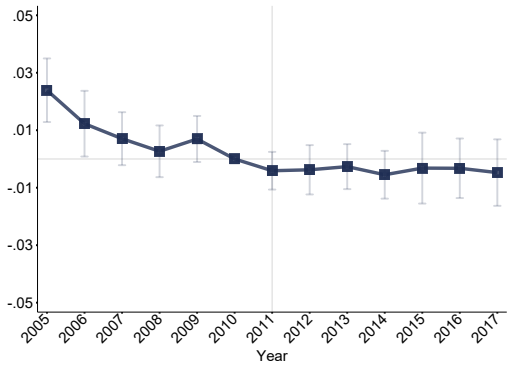
(f) Native Full-time Wages - Driving Distance

Notes: This figure shows the Czech worker inflow and its labor market effects in West Germany for two alternative definitions of treated municipalities. In the first definition (Panel a, c, e), treated municipalities are those located within 40 km of the nearest road border crossing into the Czech Republic. In the second definition (Panel b, d, f), treated municipalities are those within a 60 km driving distance of the nearest road border crossing into the Czech Republic. Event study regressions include matched pair id × year and municipality fixed effects. Event study regressions for Panels c-f include Bartik controls (see Appendix Section A1.3 for details). The gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. The German labor market opened to EU8 workers in 2011.

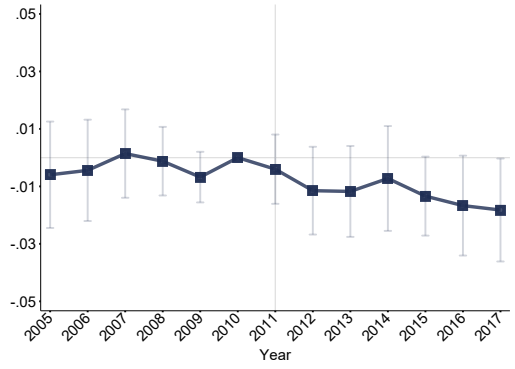
Figure E8: Labor Market Effects in West Germany - Narrow vs. Wider Border Region



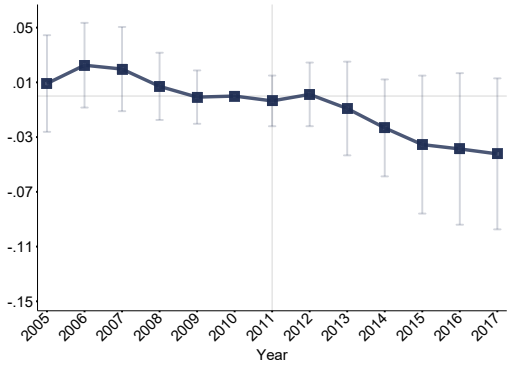
(a) Share of Migrant Workers



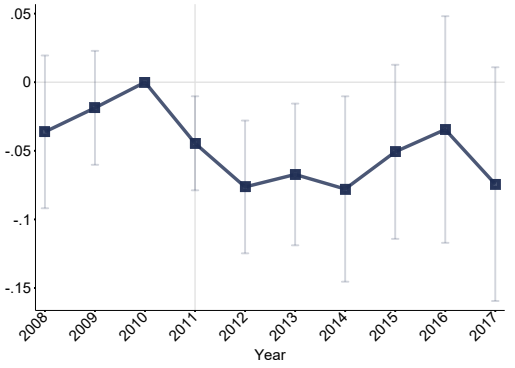
(b) Unemployment Rates



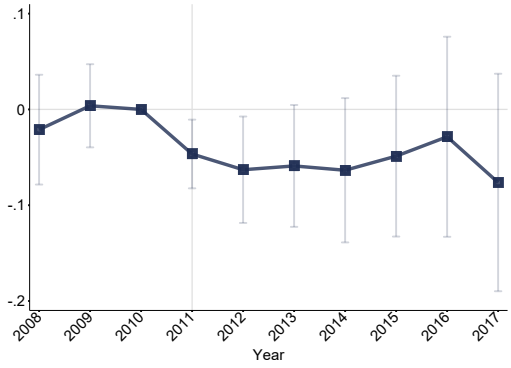
(c) Log Native Full-time Wages



(d) Native Employment



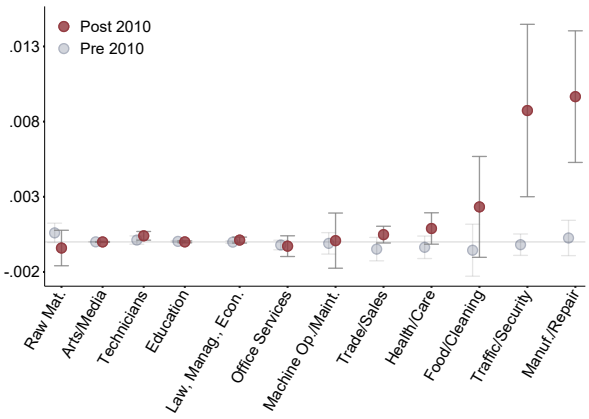
(e) Import Exposure to all EU10 Countries



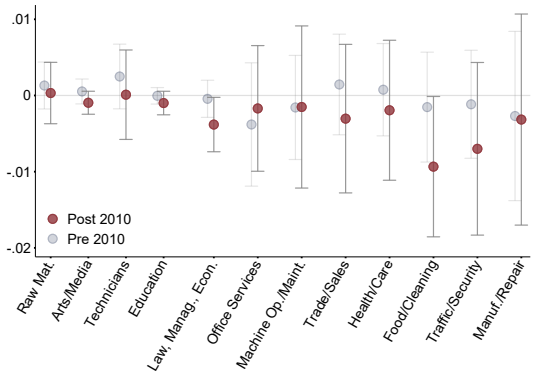
(f) Export Exposure to all EU10 Countries

Notes: This figure shows outcomes for the West German narrow vs. wider border region. I define the narrow border region as all municipalities that are located within a 60-minute driving distance from the nearest road border crossing to the Czech Republic. The wider border region comprises all municipalities that are located within a 60-120-minute driving distance from the nearest road border crossing. I show event study coefficients for the main regional outcome variables: Migrant worker shares by 2010 employment (Panel a), unemployment rates (Panel b), log native full-time wages (Panel c), and native employment by 2010 native employment (Panel d). Panels (e) and (f) present import and export exposure to all countries that joined the EU in 2004, respectively. Import and export exposure are based on trade data from the UN Comtrade database and are calculated in 1,000 EUR per worker. The graphs report import/export exposure relative to their value in 2010. Event study regressions include year and municipality fixed effects. Event study regressions for Panels (a)-(d) include Bartik controls (see Appendix Section A1.3 for details). The gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. The German labor market opened to EU8 workers in 2011.

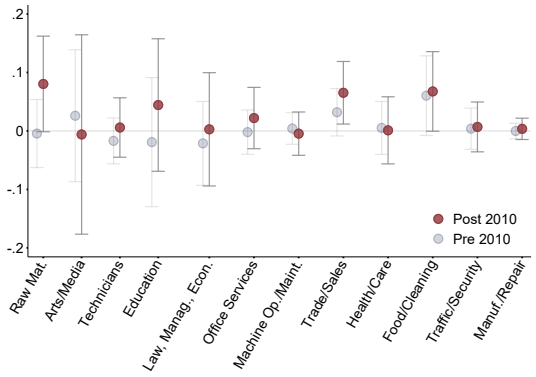
Figure E9: Labor Market Effects by 1-Digit Occupations in West Germany



(a) Share of EU8 Workers



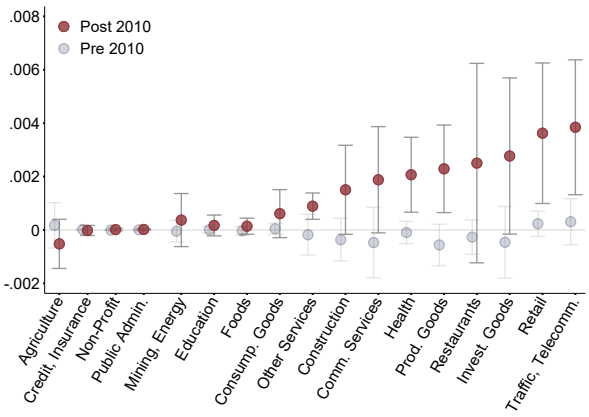
(b) Native Employment



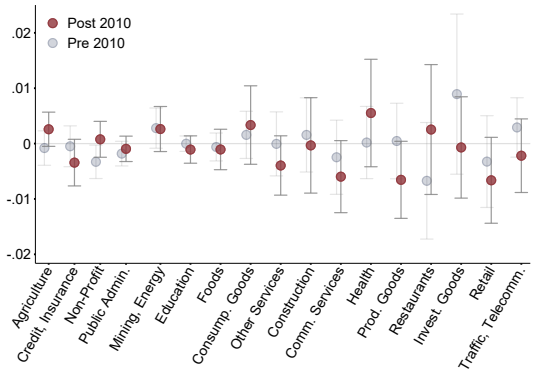
(c) Log Native Full-time Wages

Notes: This figure plots the coefficients for pre-treatment (2005-2009) and post-treatment (2011-2017) dummies by 1-digit occupation in difference-in-differences regressions which control for municipality and matched pair × year fixed effects. The sample is restricted to West Germany. Panel (a) reports the coefficients for the share of EU8 workers by 2010 employment in each 1-digit occupation. Panel (b) reports the coefficients for the share of native employment by 2010 native employment in each 1-digit occupation. Panel (c) reports the coefficients for log native full-time wages in each 1-digit occupation. Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. See Figure E10 for corresponding graphs on 1-digit industries.

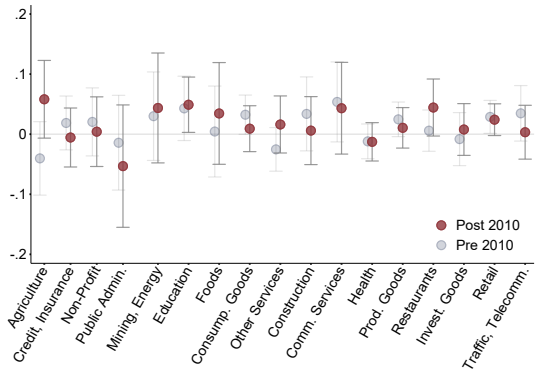
Figure E10: Labor Market Effects by 1-Digit Industries in West Germany



(a) Share of EU8 Workers



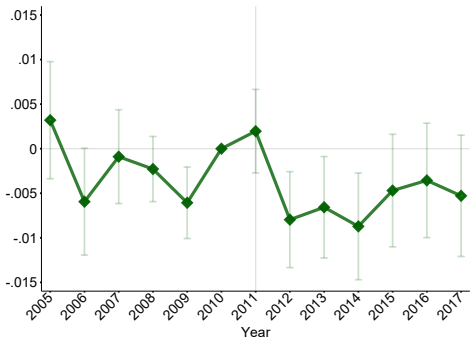
(b) Native Employment



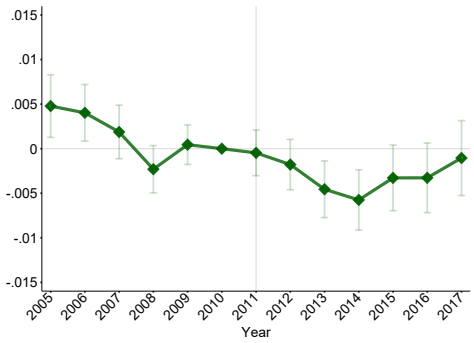
(c) Log Native Full-time Wages

Notes: This figure plots the coefficients for pre-treatment (2005-2009) and post-treatment (2011-2017) dummies by 1-digit industry in difference-in-differences regressions on the municipality level which control for municipality and matched pair id × year fixed effects. The sample is restricted to West Germany. Panel (a) reports the coefficients for the share of EU8 workers by 2010 employment in each 1-digit industry. Panel (b) reports the coefficients for the share of native employment by 2010 native employment in each 1-digit industry. Panel (c) reports the coefficients for log native full-time wages in each 1-digit industry. Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level. See Figure E9 for corresponding graphs on 1-digit occupations.

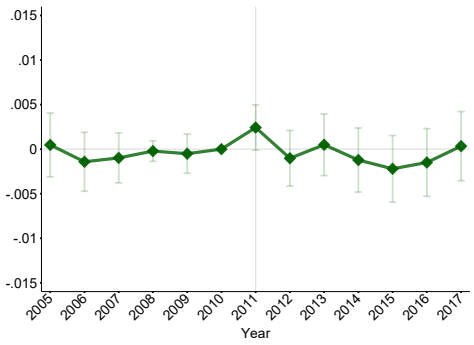
Figure E11: Labor Market Outcomes for Cohort of Matched Native Workers in East Germany



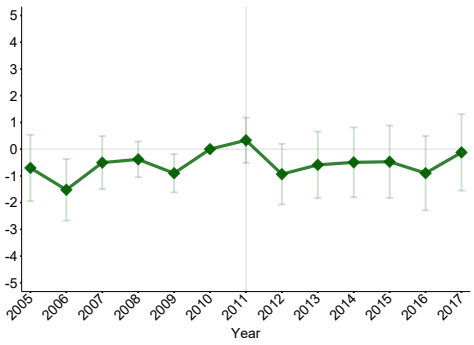
(a) Log Earnings



(b) Log Wage (Full-time)



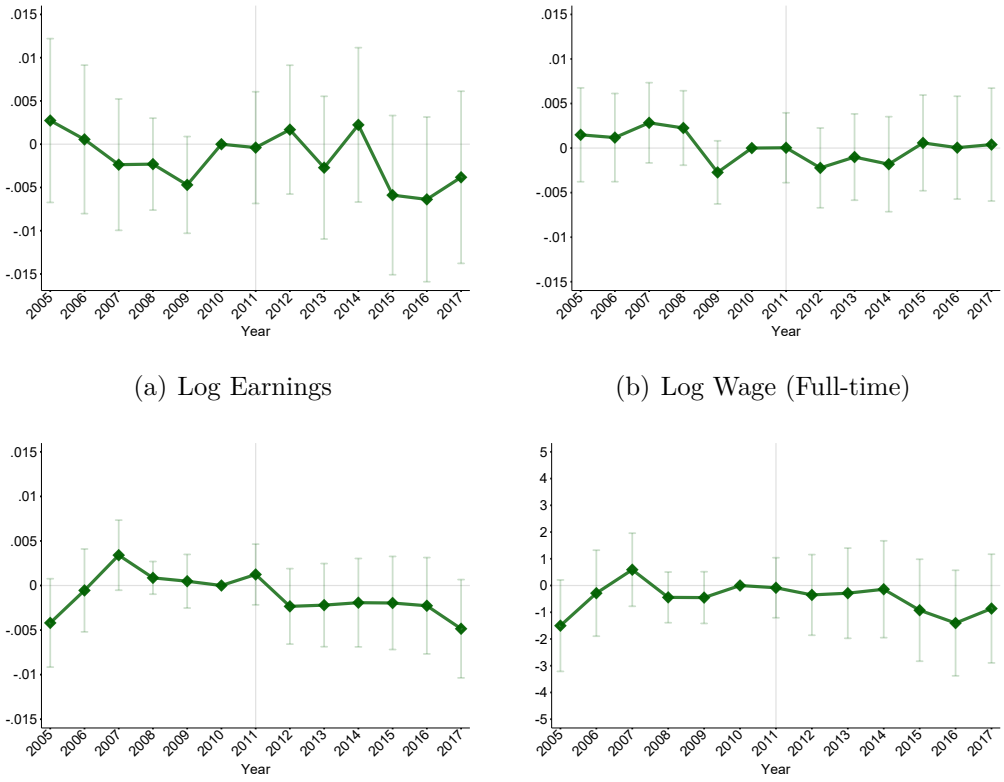
(c) Employment



(d) Days Worked per Year

Notes: This figure reports labor market outcomes for a cohort of native workers who were employed in the matched regions in East Germany in 2010. Within these regions, I use a combination of exact matching and mahalanobis distance matching to find unique matched worker pairs. I match workers exactly within cells of gender, 1-digit industry, 1-digit occupation, and a dummy for whether they work at a German firm with an affiliate in the Czech Republic. Within these cells, I use mahalanobis distance matching to find unique matches based on age (2010), experience (2010), education (2010), full-time job status (2010, 2008). Days worked refer to social-security employment (excluding minijobs). Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level.

Figure E12: Worker Analysis for West Germany - Excluding Sectors Prone to Informal Work



(a) Log Earnings

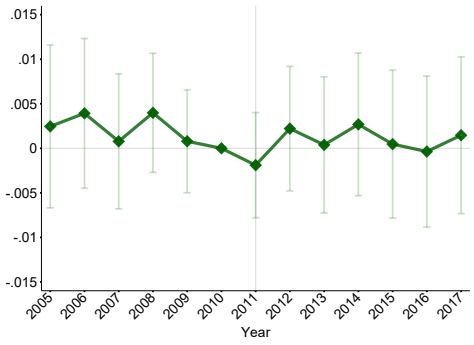
(b) Log Wage (Full-time)

(c) Employment

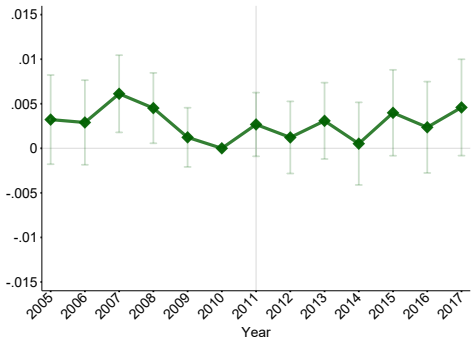
(d) Days Worked per Year

Notes: This figure reports labor market outcomes for a cohort of native workers who were employed in the matched regions in West Germany in 2010. I exclude workers employed in the 3 sectors most susceptible to informal work (construction, services for private households, and car repair). Within the matched regions, I use a combination of exact matching and mahalanobis distance matching to find unique matched worker pairs. I match workers exactly within cells of gender, 1-digit industry, 1-digit occupation, and a dummy for whether they work at a German firm with an affiliate in the Czech Republic. Within these cells, I use mahalanobis distance matching to find unique matches based on age (2010), experience (2010), education (2010), full-time job status (2010, 2008). Days worked refer to social-security employment (excluding minijobs). Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level.

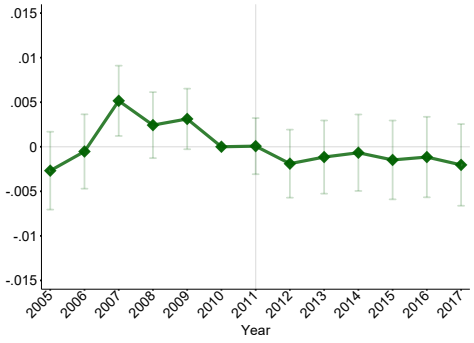
Figure E13: Worker Analysis for Germany - Restrictive Matching Version



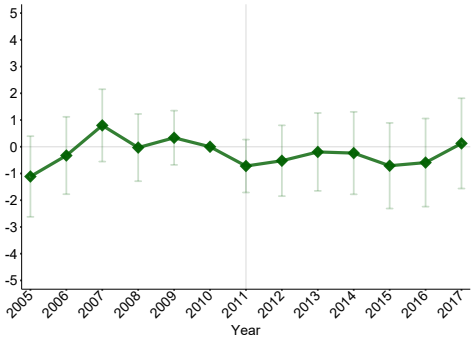
(a) Log Earnings



(b) Log Wage (Full-time)



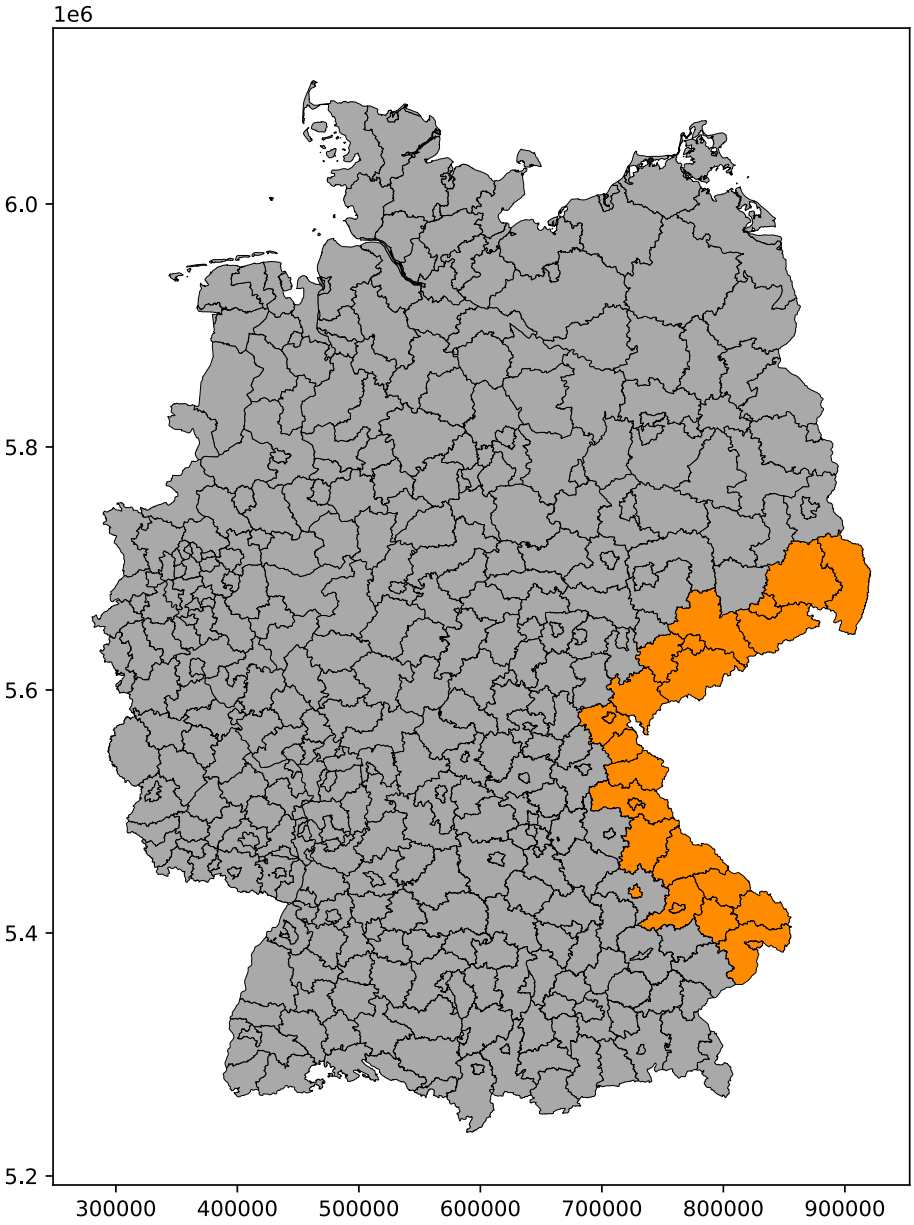
(c) Employment



(d) Days Worked per Year

Notes: This figure reports labor market outcomes for a cohort of native workers who were employed in the matched regions in West Germany in 2010. I match workers using a more restrictive matching algorithm compared to the baseline sample of workers. I use a combination of exact matching and mahalanobis distance matching to find unique matched worker pairs. I match workers exactly within cells of gender, 1-digit industry, 2-digit occupation, and years of education. Within these cells, I use mahalanobis distance matching to find unique matches based on age (2010), experience (2010), and employment status (2010). Days worked refer to social-security employment (excluding minijobs). Gray bars indicate 95% confidence intervals computed using standard errors clustered at the county level.

Figure E14: Map of Border Counties



(a) Map Showing the Definition of German Border Counties

Notes: This map illustrates the definition of German border counties used in Figure D1. Border counties include all counties with a direct border crossing to the Czech Republic. Additionally, they encompass the following towns: Chemnitz, Dresden, Zwickau, Weiden, Regensburg, Straubing, Deggendorf, and Passau.

F Tables Corresponding to Event Study Regressions in Main Part of Paper

Table F1: Regression Table with Coefficients Corresponding to Baseline Results for Czech Regions

	(1) Unemployment Rate	(2) Relative Vacancies	(3) Log Applicants per Job	(4) German Share	(5) Migrant Share
2005	0.00044	-0.30	0.095	-0.0020	-0.0034
	(0.0044)	(0.31)	(0.15)	(0.00051)***	(0.0020)*
2006	0.000085	-0.63	0.12	-0.0015	-0.0033
	(0.0039)	(0.55)	(0.13)	(0.00050)***	(0.0018)*
2007	-0.0017	-1.09	0.21	0.00026	-0.0010
	(0.0026)	(0.89)	(0.14)	(0.0010)	(0.0019)
2008	-0.00018	-0.63	0.28	0.00065	-0.0018
	(0.0020)	(0.38)	(0.093)***	(0.0010)	(0.0018)
2009	0.00071	-0.028	0.047	-0.00047	-0.0014
	(0.0017)	(0.12)	(0.11)	(0.00040)	(0.00087)
2011	-0.00082	0.025	-0.028	0.00034	0.00025
	(0.0013)	(0.13)	(0.088)	(0.00022)	(0.00065)
2012	-0.0020	0.085	-0.047	0.00082	0.00012
	(0.0015)	(0.12)	(0.10)	(0.00053)	(0.0013)
2013	-0.0040	0.49	-0.41	0.0013	0.00040
	(0.0022)*	(0.17)***	(0.095)***	(0.00065)**	(0.0015)
2014	-0.0059	0.69	-0.26	0.0016	-0.00015
	(0.0025)**	(0.42)	(0.16)	(0.00078)*	(0.0017)
2015	-0.0060	1.07	-0.27	0.0018	0.000015
	(0.0023)**	(0.66)	(0.14)*	(0.00091)*	(0.0019)
2016	-0.0069	0.90	-0.21	0.0020	-0.000037
	(0.0024)***	(1.21)	(0.14)	(0.0010)*	(0.0022)
2017	-0.011	1.84	-0.29	0.0021	-0.000023
	(0.0027)***	(1.94)	(0.15)*	(0.0010)**	(0.0024)
Observations	560	560	560	560	560
Dep. Var Mean in BR 2010	0.089	1.23	3.26	0.0034	0.038
County FE	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes

Notes: The coefficients in this table correspond to the regional-level event study graphs for the Czech Republic in the main part of the paper. Column (1) reports coefficients for the unemployment rate. Column (2) reports coefficients for vacancies relative to vacancies in 2009. Column (3) reports coefficients for log applicants per job. Column (4) reports coefficients for the share of residents with German citizenship. Column (5) reports coefficients for the share of residents with foreign citizenship. *, ** and *** correspond to 10, 5 and 1 percent significance levels, respectively. Standard errors are clustered at the county level. For the regression equation, see Equation 1 in the paper.

Table F2: Regression Table with Coefficients Corresponding to Baseline Results for West German Regions

	(1) Czech Share	(2) EU8 Share	(3) Migrant Share	(4) Unemployment Rate	(5) Native Employment	(6) Log Native Full-time Wage
2005	-0.0020	-0.0032	-0.0055	0.031	-0.016	0.0024
	(0.0025)	(0.0031)	(0.0049)	(0.0060)***	(0.013)	(0.010)
2006	-0.0023	-0.0019	-0.0050	0.011	-0.0028	-0.0024
	(0.0015)	(0.0023)	(0.0040)	(0.0050)**	(0.013)	(0.0079)
2007	-0.0011	-0.0031	-0.0066	0.0035	-0.0023	-0.0066
	(0.0014)	(0.0021)	(0.0030)**	(0.0044)	(0.015)	(0.0071)
2008	-0.00028	-0.00038	-0.00046	-0.00021	-0.012	-0.00056
	(0.00083)	(0.0014)	(0.0021)	(0.0042)	(0.016)	(0.0059)
2009	-0.00078	0.00014	0.0031	0.0053	0.00048	-0.0038
	(0.00079)	(0.0014)	(0.0019)	(0.0049)	(0.0090)	(0.0049)
2011	0.0046	0.0027	0.0012	-0.0022	-0.0087	0.0034
	(0.0020)**	(0.0026)	(0.0030)	(0.0035)	(0.0093)	(0.0078)
2012	0.016	0.013	0.0077	-0.0070	0.0036	-0.0015
	(0.0038)***	(0.0047)***	(0.0053)	(0.0039)*	(0.011)	(0.0096)
2013	0.019	0.015	0.011	-0.0066	-0.0016	-0.0043
	(0.0040)***	(0.0049)***	(0.0061)*	(0.0047)	(0.013)	(0.011)
2014	0.025	0.019	0.012	-0.0048	-0.0091	0.0048
	(0.0043)***	(0.0048)***	(0.0060)**	(0.0046)	(0.017)	(0.010)
2015	0.033	0.029	0.021	-0.0036	-0.0052	-0.00054
	(0.0069)***	(0.0081)***	(0.0098)**	(0.0040)	(0.021)	(0.0094)
2016	0.039	0.034	0.019	0.0052	-0.0070	0.0013
	(0.0086)***	(0.0093)***	(0.0099)*	(0.0055)	(0.024)	(0.0097)
2017	0.051	0.041	0.028	-0.0053	-0.0027	-0.0065
	(0.010)***	(0.011)***	(0.013)**	(0.0051)	(0.024)	(0.0094)
Observations	6084	6084	6084	6084	6084	6084
Dep. Var Mean in BR 2010	0.013	0.017	0.034	0.096	1	4.35
Muni. FE	Yes	Yes	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bartik Control	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The coefficients in this table correspond to the regional event study graphs for West Germany in the main part of the paper. Columns (1)-(3) report coefficients for the share of Czech, EU8 and migrant workers in West Germany, respectively. Column (4) reports coefficients for the unemployment rate. Column (5) reports coefficients for native employment by 2010 native employment. Column (6) reports coefficients for log native full-time wages. Columns (1)-(5) include Bartik-style employment controls, and Column (6) includes a Bartik-style wage control. See Appendix Secgtion A1.3 for more details. *, ** and *** correspond to 10, 5 and 1 percent significance levels, respectively. For the regression equation, see Equation 1 in the paper.

Table F3: Regression Table with Coefficients Corresponding to Baseline Worker Results for West Germany

	(1) Log Earnings	(2) Log Full-time Wage	(3) Employment	(4) Days Worked
2005	-0.0016	0.0020	-0.0059	-2.12
	(0.0043)	(0.0023)	(0.0022)***	(0.76)***
2006	-0.00045	0.0022	-0.0022	-0.88
	(0.0039)	(0.0021)	(0.0021)	(0.71)
2007	-0.00099	0.0034	0.0030	0.63
	(0.0034)	(0.0019)*	(0.0018)*	(0.61)
2008	-0.00024	0.0028	0.0012	0.017
	(0.0024)	(0.0018)	(0.00081)	(0.43)
2009	-0.0034	-0.00059	-9.3e-16	-0.33
	(0.0025)	(0.0015)	(0.0014)	(0.44)
2011	0.0013	0.00095	0.00055	-0.13
	(0.0029)	(0.0016)	(0.0015)	(0.50)
2012	0.0040	0.00064	-0.0025	-0.28
	(0.0033)	(0.0019)	(0.0019)	(0.66)
2013	0.0011	0.0019	-0.0024	-0.48
	(0.0036)	(0.0021)	(0.0021)	(0.74)
2014	0.0025	0.00014	-0.0037	-0.54
	(0.0039)	(0.0023)	(0.0022)*	(0.79)
2015	-0.0027	0.0024	-0.0026	-0.84
	(0.0040)	(0.0023)	(0.0023)	(0.83)
2016	0.00019	0.00038	-0.0020	-0.73
	(0.0042)	(0.0025)	(0.0024)	(0.86)
2017	-0.00058	0.0027	-0.0035	-0.37
	(0.0043)	(0.0027)	(0.0024)	(0.88)
Observations	859754	557562	992888	992888
Dep. Var Mean in BR 2010	10.0	4.33	1	350.4
Worker FE	Yes	Yes	Yes	Yes
Matched Pair × Year FE	Yes	Yes	Yes	Yes

Notes: The coefficients in this table correspond to the worker-level event study graphs in the main part of the paper. I restrict the sample to native workers employed in 2010, in West Germany. Column (1) reports coefficients for log earnings. Column (2) reports coefficients for the log native full-time wage. Column (3) reports coefficients for employment. Column (4) reports coefficients for days worked per year. *, ** and *** correspond to 10, 5 and 1 percent significance levels, respectively. For the regression equation, see Equation 2 in the paper.

Appendix References

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