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ABSTRACT

Between 1999 and 2007 Switzerland opened its labor markets to immigrants from the European Union (EU), fully liberalizing access by 2007. The timing of this labor market liberalization differed by geography, however. In particular, cross-border workers, who constituted more than half of EU immigrants, were allowed free-entry into the border region (BR), but not the non-border region (NBR), already in 2004. In this paper, we exploit the different timing of these policies in a difference-in-difference approach and estimate the effects of the policy changes on the inflow of new immigrants and on native labor market outcomes such as wages and employment by comparing the BR and NBR. We find that opening the border to EU immigrants increased their presence by 4 percent of employment, and this had no significant impact on average native wages and employment. Decomposing the effect between skill groups we find that immigrants complemented highly educated native workers, while they displaced middle educated workers and had no effect on less educated.

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An online appendix is available at:
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1 Introduction

Several pundits argue that loosening immigration restrictions would syphon-off jobs to immigrants, worsening native labor market perspectives.[1] Employers, instead, usually welcome access to foreign workers, allowing them a broader, more diverse labor force. Increased labor market openness could produce expansion and productivity growth, with positive effects to native workers.[2] The academic literature has produced many studies on the effects of immigrants on labor market outcomes of native workers, mostly finding small wage effects.[3] None of the studies we are aware of, however, has identified those effects using differences in *immigration policies* across regional labor markets within the same country. The traditional literature in this field exploits other sources of variation to address this question. The most popular is to leverage the varied historical presence of immigrants across regional labor markets due to past settlements, and construct regional inflows of immigrants following large aggregate flows using the so-called ''shift-share'' method. This imputation of a reasonable ''supply-driven'' change in immigrants is then used to identify the impact on the native labor market outcomes (e.g. Card (2001), Peri & Sparber (2009), Dustmann et al. (2013)). Alternatively, different emigration-push episodes from sending countries such as the collapse of the Soviet Union (Friedberg (2001), Borjas & Doran (2013)), the return of French expatriates from Algeria (Hunt, 1992), the return of ethnic Germans from Romania and Bulgaria (Glitz, 2012) are used in the hope of capturing an exogenous shift in the supply of immigrant workers. Both methods, however, by leveraging origin-country specific surges in migrants, do not directly consider the role of immigration policies. This paper breaks new ground by leveraging variation in the timing of immigration policy changes across regions of Switzerland to determine the effect on immigration. Further, we ask how these policies impact the labor market outcomes of natives?

Switzerland allowed free labor market access to European Union citizens by progressively removing all immigration barriers between 1999 and 2007. While communities along the Swiss border implemented these policies by 2004, communities located in the interior of Switzerland did not implement these reforms until 2007. Hence, we can use the difference in the timing of policy changes across these communities to infer the impact on immigration and on the native labor market outcomes using a difference-in-difference approach. We define the communities located along the Swiss border as the ''border region'' (BR), while interior communities are

[1] See for instance ''For Every New Job two new Immigrants'' by Camarota and Zeigler, February 2015 available at http://cis.org/for-every-new-job-two-new-immigrants.

[2] See for instance ''Hire the best workers wherever they are'' by Vivek Vadhwa, Wall Street Journal, Sept. 3rd, 2013, available here: http://wadhwa.com/2013/09/03/washington-post-hire-the-best-workers-wherever-they-are/

[3] See Lewis & Peri (2014) for a review of the literature.

defined as the ''non-border region'' (NBR). These regions include several individual labor markets (municipalities or commuting zones) that are used as the unit of analysis. As different labor markets can be subject to differential economic forces, we also control for labor demand, economic productivity, and other local area controls. Unobserved shocks to labor demand correlated with the timing of policy changes can threaten our identification strategy. We can test the plausibility of our identifying assumption by analyzing whether migration flows in BR and NBR municipalities had similar trends before 1999 and diverged with the implementation of different policies in 1999 and 2004.

The sequence of policy changes we exploit is as follows: In 1999, Switzerland signed the agreement of free movement of persons with the EU. This agreement, however, needed to go through ratification and implementation stages in order to become operational - a slow and uncertain process. One group of foreign individuals was first-in-line to be affected by these agreements. These were EU citizens who worked in Switzerland, but resided in a neighboring EU country (Austria, France, Germany or Italy). We henceforth refer to these persons as ''cross-border workers'', or CBW. Cross-border workers have participated in Swiss labor markets for a long time, but were only permitted to work in the border region. Their number and permits were subject to restrictions set at the cantonal level (each canton is a Region with administrative autonomy). After 1999, working restrictions on these workers gradually eased until they were given free access to all border region labor markets in 2004. The non-border region, however, could not host this type of immigrant workers until 2007 as their permit only allowed access to border region firms. Another group of immigrants, called Resident Immigrants (RI henceforth), were similar to CBW in their labor market characteristics, but they resided in Switzerland and could work in both the BR and NBR. The restrictions on the number of RI were maintained (although relaxed) during the between 1999 and 2007. In 2007, free mobility of all European workers (CBW and RI) was granted in both regions (BR and NBR), ending the policy differences between them.[4] The described sequencing of events implies that between 1999 and 2007 the BR experienced progressive liberalization of immigration for the CBW, culminating in free access in 2004, relative to NBR where CBW still could not work.

The difference-in-difference analysis of new immigrants reveals that the enactment of the policies granting free mobility increased the share of new immigrants in the BR by 3-4 percentage points of total post-1999 employment relative to the NBR, with most of the growth taking place

[4]The freedom of mobility was first granted to citizens of Western European countries in 2007. Only in 2011 were citizens of EU-member countries in Eastern Europe allowed the same access. See section 3 for more details about the reform.

in the 2004-2007 period when full access was granted to cross-border immigrants. While the effect was significant, it was small and took several years to unfold.[5] Importantly, we check that before 1999 there was no differential trend in the inflow of new immigrants between BR and NBR. This suggests the policy played an important role in increasing the inflow of new immigrants, becoming especially pronounced after 2004. This differential inflow between the BR and NBR remains significant after controlling for a large set of municipality fixed effects and proxies for industry-driven local labor demand.

New immigrants during this period were, on average, highly educated. Consequently, we expect they most directly compete with highly and middle educated native workers, while less educated natives may benefit from some complementarity. Hence we analyze the impact of opening the border on average wage and employment of Swiss workers, and then we divide them by educational sub-groups separating those with primary education only (that we call less educated), those with secondary education (middle educated) and those with tertiary education (highly educated). Our findings show, in aggregate, the average wage of natives and earlier immigrant workers were not significantly affected by the increase in new immigrants. However, when we separate the effects across different education groups, we find important differences. On one hand we find highly educated Swiss-born workers responded to immigration by increasing their managerial roles and skills, following an ''upgrading process'' similar to that described in D'Amuri & Peri (2014). Their wages experienced a small positive boost from immigrants while the effect on hours worked is not significant. The middle-educated Swiss workers, instead, did not ''upgrade'' their occupations in response to immigrants and suffered a nontrivial displacement effect, with negative employment consequences. Less educated natives did not experience any effect on their wages and employment. The insignificant average wage effect obtained when considering all Swiss-born workers, therefore, is the result of small but significant wages gains for highly educated natives and wage losses/displacement for the group of middle educated natives and earlier immigrants. Overall, the open border policy did not have a large effect on immigration, affecting native workers mildly in the aggregate in favor of the highly educated relative to the middle educated.

The rest of the paper is organized as follows. Section 2 reviews the literature, Section 3 describes the Swiss policies and section 4 describes the data and the variables. Section 5 presents and discusses the empirical specification, the identification strategy and shows the

[5]Note that the ratio of real GDP per capita (PPP adjusted) between origin countries and Switzerland was 80% for Italy, 82% for France, 86% for Germany and 94% for Austria in 2000 (Heston et al., 2011). While not as large as income differences between Eastern and Western European countries, the considered countries have high proximity, low cost of migration and common language with Switzerland.

main estimates of the effect on immigration. Section 6 analyzes the effects on average native labor market outcomes. Section 7 presents results by education group of natives. Section 8 concludes the paper.

2 Literature Review

As mentioned above, the literature on the labor market effects of immigrants is large and we refer the reader to recent survey articles that provide summaries (e.g. Blau & Kahn (2012); Lewis & Peri (2014); Longhi et al. (2005)). More directly connected with this study are recent papers that have analyzed the impact of immigration to Switzerland. These paper have mostly reproduced the methodology developed in studies for the U.S., or for other countries in Europe, and applied it to Switzerland. Favre (2011) investigates the impact of immigrants along the wage distribution of natives following the approach used by Dustmann et al. (2013).[6] He shows that newly arriving immigrants are overrepresented at the top of the wage distribution in high-skill occupations such as management, evaluation and R&D, and at the bottom of the wage distribution in low-skill occupations such as manufacturing, construction, and cleaning. Analyzing the impacts separately for these occupation groups, he finds positive effects on the wages of natives in the bottom percentiles and slightly negative effects on wages at the top percentiles of high-skill occupations. In low-skill occupations the effects of immigration are slightly positive or close to zero across the entire wage spectrum. Also taking a traditional approach, Basten & Siegenthaler (2013) estimate effects across occupation-experience groups. They find no effect on wages and employment of natives in the aggregate, but a reduction of unemployment and positive effect on the mobility of natives into higher-paid occupations.

Favre et al. (2013) exploit the past distribution of immigrants across commuting zones in the spirit of Card (2001) to estimate the causal effect of immigration between 2002 and 2010 on the employment and unemployment rate of natives with different education backgrounds. Their results indicate that highly educated workers were slightly negatively affected by the recent immigration wave, whereas the effect on natives with middle or low education was not significantly different from zero.

One paper that tries to exploit the difference in policy implementation between BR and NBR in Switzerland is Losa et al. (2012). The authors only look at the very short-run effect of the liberalization of CBW, by considering a difference-in-difference between BR and NBR

[6] This paper uses the past distribution of immigrants across skill-cells, not regions like Dustmann et al. (2013), to construct an exogenous immigration proxy.

and between 2003 and 2005.[7] These authors control for different demand trends across areas by matching BR and NBR municipalities on a large set of observable variables from the 2000 Census. However, they do not investigate pre-1999 trends, nor check the impact of the change in policy on immigrant flows. They present a somewhat contradictory negative short-run effect on total employment (-2.4%) and positive effect on average wages (+0.8%) of native workers and they do not analyze the differential impact by skill or occupation. The short period considered, the lack of pre-1999 trend tests, and the contradictory effect on wages and employment imposes some caveats on interpreting the results of this study.

Ruffner & Siegenthaler (2015) use the differential policy implementation between BR and NBR to investigate the effect on a set of firm performance measures. They find that opening the BR had a positive effect on firm employment and sales. Using a panel of firms, these authors also show that opening the labor market to immigrants reduced the share of firms reporting that labor market regulation for immigrant workers constrained them in their innovative activities while other obstacles to innovation remained unchanged.

A very recent paper by Dustmann et al. (2015) analyze a policy change, similar to ours. They consider the opening of Germany's border to Czech cross-border workers in June 1991 and the subsequent large inflow of these workers in municipalities near the border between 1991 and 1993, where employment of Czech workers reached up to 10% of employment. The paper then tracks the effect on employment and wages of natives. After 1993 the policy was de-facto withdrawn and a corresponding decrease in the number of Czech workers took place. The paper analyzes the short-run impact, finding a negative effect on employment of natives and a moderate, negative effect on wages. The negative effect on native employment is explained mainly by a decrease of inflow of natives into employment in the border municipalities. The authors use distance from the Czech-German border (and matched control regions) to identify the supply shock. Differently from our case, they only look at short-term effects (1990-1993) of policy for a small part of Germany, directly after the fall of the iron curtain. The inflow of workers, however, is larger than the one we use but mostly low skilled. Their results are a nice complement to ours, as they do not analyze the occupational response of natives but decompose the employment effect into inflows and outflows.

Finally, only a few recent papers have analyzed specific immigration policy changes and their impact on economic outcomes. Kerr & Lincoln (2010) and Peri et al. (2015) have considered the change in H1B visa cap (the high-skilled-immigrant visas in the U.S.) to analyze effects on

[7] In a related study, Bigotta (2013) finds a positive effect of this policy on the unemployment duration of natives.

innovation and productivity in U.S. cities. Bohn et al. (2014) analyzed the impact of Arizona's Worker Act on undocumented immigrant labor market performance. For Europe, Glitz (2012) analyzed the effect of a policy allowing ethnic Germans in Eastern Europe to obtain German citizenship which generated, in combination with the fall of the iron curtain, a sudden inflow of migrants. A handful of additional papers have tried to measure immigration policies and estimated the effect of changes in them on immigrant inflows in a multi-country gravity framework. Mayda (2010) and Ortega & Peri (2014) are two examples. In the Swiss context, Abberger et al. (2015) show that freer immigration for EU workers increased their net inflows by 10,000 to 15,000 individuals yearly. Beerli & Indergand (2014) point out this policy change also influenced the long-term trends in the skill-mix of immigrants.

3 Immigration Policies in Switzerland 1999-2007

After rejecting the proposal to join the European Economic Area in 1992 by referendum, Switzerland and the EU signed a package of bilateral agreements (BA I) on June 21, 1999 that included full bilateral access to each other's labor market.[8] Details about the liberalization process were publicly announced by the federal administration (Bundesrat, 1999) and in 2000, the entire bilateral package was approved by a referendum in Switzerland with 67.2% of votes in favor.

The integration of Switzerland into the European labor market, however, involved gradual steps (SECO, 2014). Importantly, the transition process differed for two geographic areas and two different groups of immigrant workers. Due to long-established bilateral agreements with neighboring countries the group of *cross-border workers* (CBW) who commuted daily across the national border enjoyed a special status in the *border region* (BR).[9] Prior to 1999, a CBW could obtain a worker permit if no equally qualified native Swiss worker could be found for a given job (the so-called ''priority requirement''); there was no annual quota on the number of these type of workers. However, a CBW could not work in the *non-border region* (NBR). The other type of immigrant worker, called *resident immigrants (RI),* instead could work in the BR and the NBR. The number of RI permits was subject to yearly national quotas set by the federal government; their jobs were also subject to the ''priority requirement''. Figure 1 shows a map of Switzerland with the municipalities in the BR shaded in gray, while the white municipalities

[8]The package of bilateral agreements included also agreements on the reduction of technical barriers to trade, the liberalisation of trade with agricultural good and public procurement, transport and the participation of Switzerland in the EU's research framework programmes. Importantly, the liberalisation steps of these agreements did not differ between the border and the non-border region. We explain in section 5.1 how we deal with differences in local, industry-driven shocks that could be induced by liberalised trade.

[9]These bilateral agreements were signed with Italy in 1928, with France in 1946, with Germany in 1970 and with Austria in 1973.

are in the NBR.

The gradual integration into the European labor market involved the following time line, illustrated in Figure 2:

June 21, 1999, signing of bilateral agreements (BA I).

June 1, 2002: Official start of the Agreement of Free Movement of Persons (AFMP):[10] Cross-border workers were only required to commute back on a weekly basis. Quotas and the priority requirement where still in place for cross-border workers and residing immigrant workers.

June 1, 2004: Abolishment of the priority requirement for both types of immigrant workers and full liberalization of CBW from EU17 countries in the BR.

June 1, 2007: Abolishment of quotas for resident immigrant workers from EU17 in BR and NBR and full liberalization for CBW in both BR and NBR.

As a result of these policy changes we can identify three phases that are characterized by differential changes in immigration policies, especially for CBW, in the BR and NBR. Between 1994 and 1999, the *Pre-Policy Phase*, CBW had restricted access to the BR and could not work in the NBR; this was the pre-reform status quo. In *Phase 1* of the liberalization, 1999-2003, cantonal immigration offices in the BR gained more discretion in allowing access of CBW to their labor markets, as they could issue working permits for them without a quantitative limit while still subject to the "priority clause".[11] The official start of the Agreement of Free Movement of Persons (AFMP) in 2002 was a step toward opening labor market in the BR to CBW. Then, in 2004, *Phase 2* of the reform was enacted and the labor markets of BR municipalities became fully open for CBW, who were still not allowed in the NBR. This phase marks the widest gap in access to immigrant labor between the BR and NBR. Finally on June 1, 2007, both regions adopted full liberalization for both types of workers. For RI, who are treated equally in the BR and NBR, both regions had the same degree of openness between 1994 and 2007, increasing from partial to full mobility in 2007. After 2007, immigration was fully liberalized in the BR and NBR. As we will document in section 5, the effect of the differential opening after 2004 remained largely intact in the two years for which we have data after 2007 (2008 and 2010). Thus, rather than characterizing this as a different period, we call it *Post-Phase 2*, emphasizing a continuation of some effects that took place in *Phase 2* of the policy due to inertia.

[10] This resulted in a de facto larger quota for EU17 citizens compared to before 2002 (SECO, 2014).

[11] Conversations with representatives from cantonal immigration offices revealed there was also a more relaxed handling of new CBW applications after 1999.

4 Description of Data and Summary Statistics

4.1 Data Sources and Variable Definitions

Our main data source is the Swiss Earnings Structure Survey (SESS) which collected demographic and labor market information every two years from 1994 to 2010, forming a representative cross section of workers in Switzerland.[12] The survey includes the place of work (by zip code) of each worker. We use this information to identify the municipality of work for each worker using an official crosswalk from the Federal Statistical Office (FSO).[13] Municipalities can be aggregated into 106 commuting zones (CZs) as defined by the FSO. These zones best approximate the definition of labor markets, and are constructed so that most workers commute within the zone. As described in Section 3, each municipality belongs either to the BR or NBR.[14] Note that the BR and NBR do not overlap exactly with cantonal borders, as seen in Figure 1. As for CZs, we define one as belonging to the border region if it contains at least one municipality in the border region.

Our data include individuals between 18 and 65 years old, working in the private sector with non-missing information for nationality, place of work, education, wages and hours. In the data we can identify *native workers* (born in Switzerland), immigrant workers with a short-term residency permit (RI) and cross-border workers (CBW).[15] Combined, we denote the last two groups as *new immigrants*. Those foreign-born individuals with a permanent residence permit are called *earlier immigrants*. Foreign-born can apply for permanent residence only after 5 to 10 years of uninterrupted residence in Switzerland, implying these workers have often spent a decade living in Switzerland, having permanent resident status.

The first outcome of the policy changes we analyze is the change in the number of new immigrant workers as a share of total employment. When we consider outcomes relative to native and earlier immigrant workers in a municipality or Commuting Zone, we use the total number of hours worked and their wage as measures of their labor supply and marginal productivity, respectively. The data set contains the gross monthly wage for each individual worker (in the month of October) in Swiss Francs (CHF). This measure includes social transfers, bonuses and one-twelfth of additional yearly payments. We divide this measure by the number of hours

[12] The official title of this data-set is ''Bundesamt für Statistik, Schweizerische Lohnstrukturerhebung 1994-2010''. The survey reflects the labor market situation on October 31 of the corresponding year.

[13] As the number of municipalities (and zip codes) changes over time due to mergers, we use the municipality definition in year 2000 as a time-invariant unit. Observations with outdated zip codes that could not be matched (less than 0.3%) were dropped.

[14] We thank Maurizio Bigotta for sharing the data of border region identifiers for each Swiss municipality. See Losa et al. (2012) for a detailed description.

[15] Technically, resident immigrants hold either a L permit (4 to 12 months) or a B permit (1 to 6 years), whereas cross-border workers hold a G permit.

worked in October and use the consumer price index to deflate it into *real hourly wage* of an individual worker at 2010 constant prices. We then express *hours worked* as a fraction of the number of hours worked by a full-time worker in a year.

In our regressions, we aggregate data at the area level (municipalities or commuting zones), constructing the total number of workers, total working hours or the average log hourly wage.[16] In some wage regressions we first control for individual characteristics and then aggregate the residuals as a way of cleaning for the impact of observable characteristics on individual marginal productivity. We also include age, marital status, job tenure (measured as the number of years working for the current firm) and education as individual controls. When separating outcomes by group, we define workers with tertiary education as being *highly-educated*, workers who completed secondary education are defined as *middle educated* and workers with primary education or less as *low educated*. We use additional information on the *occupation* of each worker and the industry in which the worker's firm operates.[17]

4.2 Summary Statistics and Trends

Table 1 shows the summary statistics relative to the characteristics of new immigrants and natives at the national level. Between 1998 and 2010, the stock of new immigrants increased by almost 180,000 (an increase of 45%) and their skill composition changed significantly. While in 1998 only 15% of the new immigrants were in the highest education groups, this percentage almost doubled to 30% in 2010. In that year, 70% of new immigrants were in the two higher education groups. Overall, the education distribution of new immigrants evolved so that in year 2010 they were overrepresented among high- and less-educated workers, and underrepresented among middle-educated workers (a feature shared by immigrants in several rich countries).

Table 1 also shows that in 1998 immigrants were heavily represented in the lowest paid occupations, such as hospitality, manufacturing and construction. In 2010, these occupations still represented a significant fraction of new immigrant employment, yet the largest gains in terms of employment accrued at the top of the wage distribution in analytical jobs in the R&D sector and among consultants, evaluators and analysts. Still, some manual jobs such as cleaning and hotels had a significant increase in new immigrants.[18]

Table 2 and 3 show summary statistics that allow two important comparisons. First, we present a list of average characteristics of the workforce in the border and non-border regions

[16] When analyzing wage outcomes we exclude individuals with wages above the 99th percentile of real hourly wages in each year.

[17] In SESS data, workers are allocated into 23 unique occupation groups.

[18] This change in the structure of skills of new immigrants was also noted by Beerli & Indergand (2014).

before the beginning of policy changes in 1998. While we include several controls and fixed effects to capture differences in the economy of these two regions, it is useful to note that in several average characteristics the two regions were similar. The border region had a slightly larger share of highly educated (+2.8 percentage points) workers and five-log-point-higher wages. Average age, gender shares and labor supply were almost identical between the two regions. Sector composition was similar, with some sectors such as Manufacturing, Finance and Business Activities having shares two to three percentage points higher in the BR, while sectors such as Construction, Wholesale and Restaurants/Hotels had similarly higher shares in the NBR. The lower part of Table 2, however, shows considerable differences in geographic characteristics between the BR and NBR. Workers in the border region were more likely to work in urban areas and were less likely to work in mountainous terrain. Seven of nine cities with a population larger than 50,000 were located in the border region.[19] Also, the border region municipalities have a more prevalently German-speaking population than municipalities in the NBR.

A second useful comparison is shown in Table 3 between CBW and RI in the border region. We consider these groups as relatively similar in term of working characteristics and merge them to compute the supply of foreign labor. While the summary statistics show resident immigrants were somewhat younger and more evenly distributed across education groups than CBWs, they have similar trends over the 1998-2010 period. In both groups, the share of highly educated individuals increased significantly, while the share of less-educated workers decreased correspondingly. Both groups experienced an increase in average age and average wage, and an increase in the share of women during the considered period. Overall, similar tendencies seem to characterize the changes of these two groups of new immigrants, and certainly their similarity in education, country of origin and age made them close substitute on the labor market.[20]

5 Policy Changes and New Immigrants

We first analyze whether the discontinuous and differential policy changes between the BR and NBR described in section 3 affected the inflow of new immigrants represented by the sum of cross border workers (CBW) and resident immigrants (RI). Policy changes after 1999 increased the openness of the BR (specifically for CBW) relative to the NBR in two steps up to 2007, when mobility of new EU immigrants in both regions was fully liberalized. While the specific policies targeted CBW, our first test is whether they changed the total number of new immigrants.

[19] From the nine largest cities Basel, Geneva, Lausanne, Lugano, St.Gallen, Winterthur and Zurich are located in the border region and Lucerne and Bern in the non-border region.

[20] A recent study by Abberger et al. (2015) also indicates that CBW and RI are close substitutes.

If they only substituted CBW for RI, leaving the sum unchanged, then these policies did not change the supply of foreign workers in the BR relative to the NBR and would be unlikely for them to have further effects on labor markets. By aggregating the two groups and considering them as reasonable substitutes, we analyze the impact of the policy changes in 1999 and 2004 on the pool of new immigrants, using a difference-in-difference approach.

Figure 3 shows the values and differences in new immigrants as share of the labor force in the border and non-border regions between 1994 and 2010. The share of new immigrants increased from 12.6% to 18.2% in the BR and from 5.5% to 7.4% in the NBR during the period 1999-2010. Hence the presence of new immigrants as share of employment increased by roughly 3.6 percentage points more in the BR than in the NBR. The evolution of these shares is plotted in the left panel of figure 3 while the right panel shows the evolution of the differences. Focusing on the differences between the BR and NBR, we notice that before 1999 there was a jagged and noisy evolution while after 1999 there was consistent growth, especially during the 2004-2008 period, which includes the full access of CBW to the BR. Two observations are in order. First, the pre-1999 trend in differences is rather noisy, but possibly positive, so it will be important to control for preexisting economic characteristics of the municipalities. Second, after 2007 the positive differential trend continues, probably due to inertia in migration, even though the policies were homogenized. We will analyze more formally both points below. The important visual impression from Figure 3 is that a differential trend between the BR and NBR in new immigrants as the share of employment rises in 1999 and strengthens in 2004. These two years correspond to the signing of the free mobility agreement and with the full implementation for CBW in the BR, respectively. This first impression supports an important role of policy changes in affecting differential immigration in the two regions.

5.1 Share of New Immigrants in the BR and the NBR

To investigate the effect of differential policies on new immigrants more rigorously, we run the following regression that implements a difference-in-difference approach:

$$\begin{aligned}\frac{IM_{m,t}}{TOTEMP_{m,t}} &= \alpha_m + \alpha_t + \beta_1 \left[BR_m \times I(2000 \leq year < 2004)\right] + \beta_2 \left[BR_m \times I(2004 \leq year \leq 2010)\right] \\ &\quad + X'_{m,t}\gamma + \epsilon_{m,t} \end{aligned} \tag{1}$$

The dependent variable $\frac{IM_{m,t}}{TOTEMP_{m,t}}$ is the number of new immigrants divided by the total workforce in area m and year t. It is a measure of labor supply by new immigrants relative

to the size of the labor market. The geographical areas considered in our analysis are either municipalities or commuting zones. The variable BR_m is a dummy equal to one for areas located in the border region and zero otherwise. The variable $I(2000 \leq year < 2004)$ is an indicator dummy whose value is one in the years 2000-2003, corresponding to *Phase 1* of the reforms described above, while $I(2004 \leq year \leq 2010)$ is a similar indicator equal to one in the years 2004-2010, encompassing *Phase 2* and the Post-Phase 2 years, and zero otherwise. Hence, these two periods capture the first and second phases of the progressive liberalization of BR labor mobility relative to the NBR. The term α_m represents a set of area fixed effects absorbing all time-invariant characteristics of the municipalities (or commuting zones) including those that systematically differ between the border and non-border regions, such as differences in initial sector specialization, geography, area, institutions and language. The terms α_t represent year fixed effects; they absorb common yearly economic and demographic variation. If the number of new immigrants increased differentially in the border region after the signing of the treaty in 1999, we would estimate a value of $\beta_1 > 0$. On the other hand, if the inflow of new immigrants changed differentially only after the policy for CBW was implemented in 2004, then we would observe $\beta_2 > 0$. The estimated effects, β_1 and β_2, should be interpreted as relative to the 1994-1999 period - the Pre-Policy Phase - during which the difference between the BR and NBR is standardized to be zero.

Table 4 shows the estimates of the coefficients of interest in equation (1), first considering the municipalities as the geographical units in columns 1-3 and then considering commuting zones as the geographical units in columns 4-6. Commuting zones correspond more closely to labor markets. Municipalities, however, are exactly mapped into the BR or NBR, while some commuting zones are split between them (in which case we consider them in the BR). In all specifications standard errors are clustered at the cantonal level to account for potential correlations of unobservable variables across labor markets within a canton.[21] Observations are weighted by the total workforce in the cell. Specifications 1 and 4 show the estimates including time fixed effects only as additional controls (in addition to the BR dummy). Columns 2 and 5 include municipality or commuting zone fixed effects (as regional controls), and drop the BR dummy because of collinearity. Columns 3 and 6 add a "Bartik" control to account for sector-driven changes in labor demand, described below.

The coefficient on the dummy BR_m shows the Pre-Policy difference in workforce share of

[21] In principle, we could have clustered at same geographical level as the treatment, the area level, but we opted for the more conservative clustering on the higher level of cantons as many institutional features are set on this level in the Swiss Federal system.

new immigrants was roughly 7 percentage points. The border region had a consistently larger share of new immigrants before the reform. The estimates of the coefficient β_1 (first row of Table 4) imply this difference increased by 0.9 to 1.2 percentage points of the labor force during *Phase 1* of the policy change (1999-2003). The estimate of β_2 in the second row implies the workforce share of new immigrants increased by between 2.7 and 3.0 percentage points in the period after 2004, the phase of CBW free mobility. In general, estimates change little across specifications and level of aggregation. The reform effects are jointly highly significant and the effect in the second period is significantly larger than the effect in the first period. This suggests policy changes introduced in 2004 were most important for the inflow of immigrants.

The causal interpretation of β_1 and β_2 as policy effects relies on the identifying assumption that there are no omitted time varying effects with different impacts on new immigrants between the border and non-border regions. One concern is that industry-driven, local labor demand trends could be correlated with the inflow of newly arriving immigrants, and could be potentially associated with the policy differences. For instance, the trade liberalization introduced in some industries after 2002 through bilateral trade agreements with the EU could have affected regions differently depending on their preexisting industrial structure and proximity to the border. Or longer-run technological trends might have been different in the BR and NBR due to their initial specialization and might have attracted new immigrants to different degrees.[22] Hence it is important that we account for industry-specific demand changes that differ across regions. To control for these shocks, we include a measure of employment shifts based on the sector composition specific to the area in 1994.[23] The basic idea is that industry-specific demand shocks at the national level affected regions differentially to the extent that these regions specialized in some industries rather than others. If employment in a given industry increased (decreased) nationally, regions where that industry represented a significant share of production must have experienced a positive (negative) relative change in the demand for workers relative to regions where that industry is scarcely present. We define the sector-driven employment for group G in a commuting zone m in year t as:

$$\widetilde{EMP}^{G}_{m,t} = \sum_{i \in \{1,50\}} \left(EMP^{G}_{i,m,1994} \times \frac{EMP^{G}_{-m,i,t}}{EMP^{G}_{-m,i,1994}} \right) \tag{2}$$

where $EMP^{G}_{i,m,1994}$ is the employment level of group G (which could be, alternately, all

[22] The influence of local demand has also been highlighted by Beerli & Indergand (2014) who show the immigrant composition in terms of skills at the local level responds strongly to skill-biased local demand shifts.

[23] This control was initially proposed by Bartik (1991) and Blanchard & Katz (1992) and has found wide application in the literature, e.g. Autor & Duggan (2003); Notowidigdo (2011); Peri et al. (2014).

workers or specific education group of workers) in commuting zone m and (2-digit) industry i in the the earliest available year, 1994. $\frac{EMP^G_{-m,i,t}}{EMP^G_{-m,i,1994}}$ is the group employment growth factor between 1994 and year t for the industry nationally, excluding the commuting zone of interest.[24] Following the literature, we sometimes call this imputed demand-shifter the ''Bartik index'' for employment growth, following Bartik (1991). In columns 3 and 6 of Table 4, we include $\ln(\widetilde{EMP}^{Total}_{m,t})$, the logarithm of (2) calculated for total employment, as an additional control. This local, industry-driven employment index has significant power in predicting immigrant employment. Its inclusion among controls, however, does not change the precision and or magnitude of the estimated policy effect on the employment share of new immigrants. This is consistent with the idea that the estimated association of the policy with new immigrant flows is not upwardly biased by omitted demand shocks.

5.2 Skill Composition of New Immigrants in the BR and the NBR

Before analyzing the impact of the liberalization of EU immigrants on natives, it is useful to analyze how the skill composition of new immigrants responded to the policies. Besides increasing the total inflow of new EU migrants, the policy could have altered the selection and skill composition of immigrants.[25] To analyze the potential effects on skill selection, Table 5 shows the impact of the two policy phases on the share of new immigrants in each education group, comparing the BR and NBR. The reported coefficients represent the estimates of β_1 and β_2 from equation (1) when the dependent variable is either the share of highly educated (Panel A), the share of middle educated (Panel B), or the share of low educated (Panel C) among new immigrants (rather than the immigrant share in the labor force).The estimated coefficients are very stable across columns that differ by geographical unit (municipalities in columns 1-3 and commuting zones in columns 4-6) and or by the inclusion of different controls. Looking at the estimates in Panel A, we see no significant change in the difference of the share of highly educated new immigrants in Phase 1 or in Phase 2, between the BR and NBR. In Phase 2, however, there was a significant decrease in the difference of the share of middle educated workers and a corresponding increase in the difference of the share of low educated workers in the

[24]Here, group G is total employment, later - e.g. in section 7 - we will use education group specific Bartik measures. To avoid spurious correlation, we exclude each commuting zone's own industry employment in the calculation of the growth factor. Note that we can only construct meaningful Bartik controls on the commuting zone level, as the sample size is too small at the municipality level. In the regression we use Bartik controls on the level of commuting zones in both CZ and municipality specifications. We dropped the industry 'Recycling' which was not available in all years.

[25]Beerli & Indergand (2014) showed that removing the immigration restrictions with the EU produced a slower increase (decrease) in the share of highly (low) educated in that group compared to non-EU immigrants, for whom restrictions were not altered.

BR relative to the NBR. In other words, the table shows that the share of middle (low) educated immigrants was higher (lower) in the BR prior to 1999 relative to the NBR (cf. the positive (negative) sign on the BR_m term in Panels B and C, respectively). By 2010, the skill mix of immigrants in both regions became more similar. This was the result of a smaller (larger) inflow of middle (low) educated immigrants into the BR compared to the NBR after 1999. Lower barriers to immigration affected the immigration of less educated workers more than the immigration of middle educated workers, who were possibly responding in part to labor demand in Switzerland. Let us emphasize, relative to native workers, the inflow of new immigrants was high-skill intensive and remained such after the implementation of the policies. However, outside of the highly educated, the liberalization policies might have encouraged a stronger immigration response in the lower, relative to the intermediate, part of the skill distribution. We return to this compositional effect when we analyze the impact of immigrants on outcomes of different skill groups of native workers.

5.3 Robustness and Validity of Identification

5.3.1 Pre-Reform Trends

The difference-in-difference approach of equation (1) can be generalized in a regressions environment to include interactions of the BR_m dummy with each year, including the pre- and post-reform years. Consider the following specification:

$$\frac{IM_{m,t}}{TOTEMP_{m,t}} = \alpha_m + \alpha_t + \sum_{t=1994}^{1996} \gamma_t [BR_m \cdot I(year = t)] + \sum_{t=2000}^{2010} \beta_t [BR_m \cdot I(year = t)] + X'_{m,t}\delta + \epsilon_{m,t} \tag{3}$$

The dependent variable in equation (3) is the same as in equation (1). The variable $I(year = t)$ is an indicator dummy equal to one in year t and zero in every other year, and the term $BR_m \cdot I(year = t)$ captures the interaction between that year and the border-region dummy. As we include year dummies α_t and area dummies α_m, we omit the interaction term for year 1998, which we consider as the base year, so the other coefficients will represent the BR-NBR difference relative to the 1998. The unrestricted estimation measures the differential inflow of new immigrants (as a share of the working population) in each year relative to the base year. The coefficient γ_t and β_t can be interpreted as the difference in the presence of new immigrants between the BR and NBR in each year of the *Pre-Policy Phase* and of *Phase 1* and *Phase 2*. When considering this specification, we have a testable assumption regarding the validity of our

identification strategy. The estimated impact of the policy should be zero prior to the date it was announced. Hence, we should find $\gamma_t = 0$. If the policy had any impact, we should find a positive effect after its announcement in 1999, and thus some of the β_t coefficients should be larger than zero.

Figure 4 plots the coefficients γ_t and β_t, and the 95% confidence interval from the estimation of equation (3) at the municipality level. The effect in 1998 is standardized to zero. Included in $X'_{m,t}$ is the Bartik index as a control beside time and municipality fixed effects. The coefficients γ_t are not significantly different from zero and do not show a trend prior to 1999. The β_t coefficients, instead, are significantly different from zero after 2000 and show a steady increase during the policy period, especially after 2004. In total, there is an increase of 4 percentage points in the difference in new immigrant shares between the border and non-border regions by 2010. This implies trends in immigrant exposure were not significantly different between the border and non-border regions, conditional on controls, *prior* to the signing of the EU agreements; immigrant exposure started to differ after their signing in 1999, however. This divergence became more pronounced with the implementation of free mobility of CBW in the BR in 2004. The point estimates of each coefficient γ_t and β_t can be found in appendix Table A2 which also shows estimates of equation (3) both at the municipality and the commuting zone level with different sets of controls. Qualitative and quantitative estimates are consistent with our identifying hypothesis that the passing and implementation of differential policies was the driver of a significant differential trend in net inflow of new immigrants between the BR and NBR. Interestingly, the figure also reveals that the difference in immigrant exposure did not reverse after 2007, when both regions became fully open in the post-Phase 2. This indicates that there are some inertia in the effect of the policy which we will explore more next.

5.3.2 Robustness Checks and Regional Heterogeneity

As shown in section 4.2, the border and non-border regions were rather similar in terms of their demographic characteristics, such as the distributions of age and schooling across workers, and in terms of their industrial structure. However, they exhibit some heterogeneity in terms of geography: The border region is more urban, less mountainous and closer to the Swiss border. In this section we explore some geographical aspects of the regions further. On one hand, we investigate the robustness of the effects of policies when we include geographical controls. On the other, we look for further insight regarding how geography might have interacted with the immigration reforms.

Table 6 shows a series of robustness checks for the difference-in-difference specification of equation (1), whose baseline results are reproduced in column 1. In column 2 we perform an important robustness check that accounts, as best as possible, for the geographic differences of municipalities in the BR and NBR. In this specification we restrict the sample to include only those BR and NBR municipalities located next to a municipality from the other region (BR for NBR and NBR for BR). In other words, this regression ''matches'' adjacent municipalities in both regions, and thus share similar geographical features and labor and product market conditions. This procedure reduces the sample size drastically. Still, as we can see from column 2, it yields almost identical point estimates for the effects of Phase 1 and Phase 2 of the reform.[26] Then, in specification 3, we drop the seven largest municipalities in the border region. Eliminating the urban centers within the BR restricts the comparison between municipalities across regions with a similar average workforce size and similar intermediate level of urbanization.[27] The estimates of the differential effects on new immigrant share remain almost unchanged.

Next, we explore whether there is some important heterogeneity of the effects of the policy across different type of economies within each area. The next two specifications restrict the sample in both the BR and NBR to only urban (column 4) and only rural (column 5) municipalities. While this comparison increases the homogeneity of labor markets on both sides, it allows us to identify the type of municipality that responded more to the policy. The coefficient estimates show the differential change in immigrant share is only sizable and significant when we consider urban locations on both sides of the policy regions. It is likely the more active labor markets of the prevalently urban BR were those in which the policy produced an effect (although the previous check indicates the largest urban areas did not solely drive our results). We then interact the policy dummies for preexisting amenities in order to produce a differential effect between municipalities in the ''treated group''. In particular, ''distance to the international border between Switzerland and other EU countries'' might have considerable influence on the location decisions of immigrants and hence, for a given policy, municipalities near the international border might have received stronger ''treatment'' (i.e. immigrant inflow) after the beginning of the policy.[28] Columns 6-9 compare municipalities in the border region within distance intervals from the national border to the entire control group of non-border region

[26] We obtain a similar estimate if we constrain the sample to include only municipalities which are within 10 minutes driving time from the other region. This selects even fewer municipalities at the border between the BR and NBR where this border does not coincide with a natural barrier, such as a lake or a mountain ridge.

[27] Specifically, the average total workforce is 846 workers in the border region and 852 in the non-border region, compared to 1,214 and 852 before dropping.

[28] Several studies show that common language and distance from the country of origin are important determinants of the location decision of immigrants conditional on local labor demand, see e.g. Grogger & Hanson (2011) and Mayda (2010).

municipalities. This evaluation shows that change in immigrant exposure was larger (although not significantly so) among municipalities close to the national border. All municipalities in the BR, however - even those farther from the border - show a significant effect of at least one of the reform dummies. This check also shows that the impact of Phase 2 was particularly strong considering BR municipalities closest to the Swiss international border (see estimates in column 6). Finally, columns 10-12 show the differential effect separately estimated for different linguistic areas of Switzerland in the treatment group (BR), while the control group (NBR) still includes all municipalities. These specifications show the French-speaking municipalities in the border region experienced the largest change in immigrant exposure (6.4 percentage points in Phase 2), followed by the Italian/Romansh-speaking part (3 percentage points), while in the German-speaking part the change in new immigrants cannot be distinguished from zero. Overall, these robustness checks emphasize that the impact of reforms on the immigrant share is robust and diffused across municipalities in the BR (using NBR the control group). With different intensity, the differential changes in policies seems to have affected the inflow of new immigrants in most parts of the BR. The intensity of new immigrant growth was strongest in urban municipalities - those close to the international border and in the French-speaking area.

We do a final check, to test that the policy difference between the two types of regions was the cause for the differential share of new immigrants. Exploiting the fine level of geographical detail of our municipality data, Figure 5 shows the change in immigrant share from 1998, the year prior to the announcement of reforms, to year 2002 (during Phase 1), to year 2004 (beginning of Phase 2) and to year 2010 (Post-Phase 2) for municipalities which are within in 30 minutes commuting time to the other region (BR or NBR).[29] The figure represents a simple regression discontinuity result, with the straight line representing an estimate of the change in immigrant share as linear function of the commuting time from the border between BR and NBR. Circles to the left of zero, with negative distance, represent municipalities in the NBR whereas circle to the right represent municipalities in the BR. The size of the circle is proportional to the labor force in that municipality. The dashed lines are the 90% confidence interval of this estimate.[30]

[29]The estimate of the border region intercept is not sensitive to this sample selection. Similar results were obtained using only municipalities in commuting zones bordering the border between both regions or using longer commuting distances to this border.

[30]Specifically, we estimate the follow specification

$$\Delta^{t}_{1998}\left(\frac{IM_m}{TOTEMP_m}\right) = \alpha^t + \beta^t_1 BR_m + \beta^t_2 distance_m + \beta^t_3 distance_m \times BR_m + \epsilon_{m,t}$$

where $distance_m$ represents the shortest commuting time (by car) from each municipality to the closest municipality on the other side of the border between the border and the non-border region. We restrict the sample to include only municipalities within 30 minutes commuting time to this border. β^t_1 is an estimate of the discontinuity in the change in immigrant share in employment between 1998 and year $t \in \{2002, 2004, 2010\}$ at the border between both regions.

The figure illustrates whether there is a discontinuity in the change in immigrants share as we approach the border between both regions during Phase 1 (2002) and during and after Phase 2 (2004 and 2010). Panel A shows that the change in immigrant exposure from 1998 to 2002 was not different from zero on either side. This difference increased by 2004 (Panel B), when the border region was opened to CBW while the non-border region was not. In this period, the employment share of new immigrants increased significantly in the border-region municipalities while in municipalities in the non-border region the change was not different from zero. Furthermore, the estimated discontinuity at the border between the two regions was roughly 2 percentage points and significant.[31] Panel C of figure 5 shows that the differential growth of immigrant share persists considering the 1998-2010 change, after free mobility was also adopted in the non-border region. The share of new immigrants changed in the NBR as well relative to is level in 1998 but the difference (at the border) between the regions remained substantial.[32] Thus, this figure confirms that a discontinuity in the share of immigrants exists, *at the border between BR and NBR* and this difference arose mainly between 2002 and 2004, and it persisted to 2010, revealing a certain inertia in the effects of the policy differential. As the immigration policy is the only variable that changes exactly at the BR-NBR border this check adds further validity to our identification.

6 Effects on Natives

6.1 Aggregate Effects

6.1.1 The Average Policy Effect on Hourly Wages

As we showed, the differential liberalization of immigrants into the BR and NBR induced by differences in policy implementation had a significant impact on new immigrants. Thus, we can use the variation induced by these policies to analyze the consequences for native workers' labor market outcomes.

We first use the same identification strategy as the previous section and estimate a difference-in-difference specification with outcomes for native workers as dependent variables within a

[31] The magnitude of estimate is robust the the exclusion of the largest municipality, Zurich, in the border region.

[32] The hypothesis that the difference at the border between both regions remains similar as in the period 1998 to 2004 also in later periods cannot be rejected.

regression framework:

$$y^G_{m,t} = \alpha_m + \alpha_t + \beta^G_1 \left[BR_m \times I(2000 \leq year < 2004)\right] + \beta^G_2 \left[BR_m \times I(2004 \leq year \leq 2010)\right] + X'_{m,t}\gamma + \epsilon_{m,t} \quad (4)$$

where $y^G_{m,t}$ is the outcome of interest measured for group G that could represent all native workers, or a subgroup, in area m and year t. The estimates of β^G_1 and β^G_2 reveal whether outcomes for group G *changed differentially* in the BR relative to the NBR in *Phase 1* or *Phase 2* of the policy reforms, respectively, vis-a-vis their values in the Pre-Policy period, 1994-1999. The first outcome variable that we consider is log hourly wages of native workers. The interpretation of β^G_1 and β^G_2 as effects of the policies hinges on the identifying assumption of no omitted time-varying region-specific effects correlated with the policy and outcomes. As before, we use year and area fixed effects, and we include specifications that control for the Bartik index of demand and other demography controls.[33]

The results of this reduced form estimation of equation (4) produces an ''average treatment effect'' of the immigration policy on natives' labor market outcomes. The estimates for log hourly wages of natives (Panel A) and earlier immigrants (Panel B) are reported in Table 7. In parenthesis under the estimates we report robust standard errors clustered at the cantonal level. Columns 1-4 show estimates at the municipality level and Columns 5-8 at the level of commuting zones. In Column 1 (Column 4), we only include year and area fixed effects; in Column 2 (Column 5) we include the Bartik control; demographic characteristics of the area are included as control in Column 3 (Column 6).[34] In Column 4 (Column 8) we use an alternative way of controlling for individual demographic characteristics by adjusting individual wages through a regression that controls for individual-level demographic characteristics before averaging the residual variation at the area level.[35] Panel A of Table 7 shows relatively precisely estimated effects on native wages. The coefficients are never larger than one percentage point, and are not

[33] We construct a separate Bartik measure for wage outcomes:

$$\widetilde{w_{m,t}} = \sum_{i \in \{1,50\}} s_{i,m,1990} \left(w^G_{i,m,1994} \times \frac{w^G_{-m,i,t}}{w^G_{-m,i,1994}} \right)$$

where $w^G_{i,m,1994}$ is the initial log hourly wage payed in (2-digit) industry i for education group G in location m in the first available wave in 1994 and $\frac{w^G_{-m,i,t}}{w^G_{-m,i,1994}}$ measures industry wage growth for that group on the national level (excluding area m). Wage growth is aggregated using each industry's employment share in 1990 $s_{m,i,1990}$ taken from the national Census.

[34] We control for each area's share of male, married, highly and middle educated workers, as well as for average age and tenure, and a squared term of each.

[35] Specifically, we regress each individual's log hourly wage on a very flexible form of individual demographic characteristics following what is done in Card (2001). Details of this procedure are explained in the data appendix.

statistically different from zero. Neither in *Phase 1* nor in *Phase 2* of the reform did average native wages experience any significant change. A test for joint significance of both β_1^G and β_2^G for Swiss native workers is rejected for all columns at the 5% level. Panel B of the same table 7 shows the estimated effect of the policy on the average wage of previous immigrants, who are permanent residents of Switzerland. Even in this case we see very small estimates and no statistical significance.[36]

6.1.2 The Causal Effect of Immigration on Hourly Wages

If we assume the only channel through which immigration reforms affected native labor market outcomes was through changing the supply of new immigrant workers, then we can use the policy - namely the difference-in-difference dummies - as instruments for the change in new immigrants, and consider equation (1) as the first stage of a two-stage least squares estimation of the impact of immigrants on native outcomes. The 2SLS estimate is obtained by running the following equation:

$$y_{m,t}^G = \alpha_m + \alpha_t + \delta^G \left(\frac{IM_{m,t}}{TOTEMP_{m,t}} \right) + X'_{m,t}\pi + \eta_{m,t} \tag{5}$$

In expression (5) above, the main explanatory variable is the share of new immigrant workers on the total working population in area m and year t, $\frac{IM_{m,t}}{TOTEMP_{m,t}}$. Estimating equation (5) with OLS would lead to biased estimates because of the potential correlation between $\eta_{m,t}$ and $\frac{IM_{m,t}}{TOTEMP_{m,t}}$ driven by unobserved local demand changes. However, our differential policy changes between the BR and NBR provides, under the assumptions outlined above (i.e. no omitted time-varying confounders and the exclusion restriction), a valid instrument. We use the interactions between the post-1999 period and the border region identifier as instruments for immigrant exposure in equation (5). Then, estimates of δ^G represent the causal effect of immigrant exposure on labor market outcomes of existing groups of workers.

The results of this 2SLS estimation for log hourly wages of natives (Panel A) and earlier immigrants (Panel B) are presented in Table 8. The columns in this table are similarly organized as in Table 7, showing specification at the municipality (commuting zone) level, controlling for fixed effects only in Column 1 (Column 5), including the wage Bartik in Column 2 (Column 6), and including additional demography controls in Column 3 (Column 7), or using

[36] In further checks, available upon request, we have estimated the year-by-year response of outcomes differentially for the BR and NBR, implementing specifications (3). We find, reassuringly, that all native outcomes do not have a significantly different pre-reform trend between the BR and NBR. Sometimes, however, the standard errors of these estimates are quite large.

the adjusted wage measure to control for demographic characteristics in Column 4 (Column 8).[37] In the rows of the table, we perform two slightly different ways of instrumenting. In the first row of each panel (A and B), we use the exact set of dummies as equation (1) namely $[BR_m \times I(2000 \leq year < 2004)]$ and $[BR_m \times I(2004 \leq year \leq 2010)]$, distinguishing between Phase 1 and Phase 2 (plus the Post-Phase 2) of the policy. These dummies should capture the potentially different policy effect in the two phases on immigration and, in turn, on native wages. Then in the second row of Panels A and B, we also adopt a simpler approach using only the interaction of BR_m with the entire post-1999 period as the instrument. This combines the years in which reforms were approved and implemented so that we include only one interaction term, $[BR_m \times I(2000 \leq year \leq 2010)]$. This instrument leverages the policy differential in the border region after the reform onset.

Two results are very clear from the 2SLS estimates of Table 8. First, the coefficients suggest that the effect of a 1 percentage point increase in the foreign-born labor force on native wages is very small. The most demanding specifications - those including fixed effects, Bartik and demographic controls (Columns 3 and 7) - imply effects between -0.04 and 0.10 percent on native wages for an increase in immigrants by one percentage point of employment. Second, the effect on earlier immigrant wages is also small and insignificant, ranging between -0.09 and 0.14, in the most demanding specifications. Let us also notice the policy instrument seems stronger when we combine the first and second phases of the policy. The F-statistic of the first stage, reported below the estimates, is between 5 and 7 when using separate instruments for Phase 1 and Phase 2, and between 9 and 11 when combining them into one set of post-1999-BR dummies.

The estimates of Table 8 are the ratio of the estimates of Table 7 (reduced form) and the estimates of Table 4 (first stage). If we think the only effect of the policy is a change in the supply of foreign-born workers, we can use this policy (in the 2SLS) to estimate the elasticity of native wages to the supply of foreign-born workers. This elasticity turns out to be very small and not significantly different from zero.

6.1.3 Displacement of Natives and Earlier Immigrants

The insignificant effects of immigrants on native wages found in the previous section confirm the findings of previous papers for other countries (e.g. Card (2001), for the U.S., Glitz (2012) and D'Amuri et al. (2010) for Germany). It is important, however, to analyze whether immigration reduced employment of natives. Some studies (e.g. Borjas (2003)) have suggested

[37] We use both the wage Bartik, as in the reduced form, and the employment Bartik, as in the first stage, in all 2SLS wage regressions. The results do not change if we exclude either Bartik measure.

an insignificant local effect on wages may still coexist with important displacement effects of immigrants on natives. If this is the case, one should find a negative impact of immigrants on native employment.

To this end, we run a regression like equation (4) with the logarithm of total hours worked (in full time equivalents) in area m in year t by group G as the dependent variable. This outcome measures the local group-specific labor supply, capturing any change associated with fewer hours worked (intensive margin) or individual displacement into non-employment (extensive margin). In this case, the estimates of β_1^G and β_2^G measure whether the local labor supply of group $G \in \{\text{natives, earlier immigrants}\}$ changed differentially in the BR and NBR during Phase 1 and 2 of the policies, respectively. Table 9 reports these estimates for natives (Panel A) and earlier immigrants (Panel B). Column 1 presents estimates using year and area fixed effects only when the unit of analysis is a municipality. Column 2 includes the employment Bartik and Column 3 adds average demographic characteristics of an area.[38] Column 4-6 repeat the same specifications with commuting zones as the units of observation. In the case of natives, the point estimates for both periods, β_1^G and β_2^G, are negative but small and never significantly different from zero. This implies the total native labor supply measured in hours worked did not change differentially during the period of differential BR-NBR policy. However, for earlier immigrants, and using commuting zones as units, β_1^G and β_2^G are estimated to be negative and statistically different from zero. As emphasized in other studies for other countries (e.g. D'Amuri et al. (2010)), earlier immigrants could be affected more by competition from new immigrants than from natives, which explains why we find some displacement for them during the policy period. Notice that the displacement of earlier immigrants is only significant in the first phase of the policy and not in the second, which achieved full liberalization. Potentially anticipating the inflow of new immigrants, older immigrants may have moved out of the labor markets most likely to be affected (the BR labor markets).

To obtain the causal estimate of the effect on hours worked by natives (in percentage) of an increase in foreign-born by one percentage point of employment, we will estimate equation (5) using the period-BR dummies as instruments. Table 10 presents these 2SLS estimates for natives (Panel A) and earlier immigrants (Panel B) using two separate interaction terms for Phase 1 and 2 as instruments (row 1 of each panel) and only one interaction term for the entire post-1999 period (row 2 of each panel). Column 1 (Column 4) uses year fixed effects and fixed

[38]Note that 'adjusting' an outcome measure from individual demographic characteristics, like in the case of mean hourly wages, is not feasible for total employment. This is why we use local averages of demographic characteristics only as controls.

effects for municipalities (commuting zones), respectively. Column 2 (Column 5) includes the Bartik employment growth as a control, and Column 3 (Column 6) uses additional mean area demographic characteristics as controls. While we still observe some negative point estimates, we do not find any significant coefficient on the labor supply response of natives. Unfortunately, the point estimates as well as the standard errors are rather large, so we cannot reject some crowding out, but we find no positive evidence of it. On the other hand, the results for previous immigrants in commuting zones finds some displacement of these workers (only when we use the instrument that merges the two policy periods, though). New immigrants may have replaced old ones in the border region in some jobs, but no effect on aggregate employment and wages of natives is detected.

Overall, our difference-in-difference reduced form approach, and the 2SLS estimates derived from the same identification approach, confirm no effect of free labor mobility on the average wage or aggregate employment of native workers. This confirms results found in a large part of the existing literature (e.g. Basten & Siegenthaler (2013) or Favre (2011)). However, our analysis is based on a new and policy-based identification strategy. In the case of earlier immigrants, we do not find any wage effect from new immigrants, but in some specifications we find results consistent with displacement. This is consistent with the notion that immigrants are not mainly competitors with natives in the labor market, but rather the competitive and complementarity effects balance each other, hardly affecting aggregate native labor market outcomes.[39] Armed with such a credible and new identification strategy, that is particularly interesting as it leverages a policy-change. In the next section we will analyze the effects of immigration on specific groups of workers and on the mechanisms set in place that affected native labor market outcomes.

7 Extensions and Heterogeneity

While the previous section finds no evidence of significant aggregate (average) effects of immigration on native wages and employment, different degrees of complementarity and competition with immigrants with different groups in the native population could produce differential effects across them. Moreover, as the lack of negative effects on native wages and employment rule out a simple model in which labor demand is downward-sloping in the short run, native and immigrants are homogeneous and all else is given, we can also analyze the margins of adjustment in response to freer immigration, e.g. whether natives move across specializations and jobs at work

[39] This finding is in line with Favre et al. (2013) who could not establish strong displacement of natives either, or Basten & Siegenthaler (2013) who even find that immigrants reduce native unemployment.

making them more complementary or insulating them from the negative effects of competition.

As documented in section 4.2 the flows of new immigrants between 1998 and 2010 were concentrated among highly educated workers. Depending on the types of interactions between highly educated immigrants and natives, this fact implies highly educated natives could benefit in cases of complementarity when the two types of skilled workers specialize in different occupations or suffer from competition. Similarly, other groups (the middle and less educated) can either be complementary or competitors of immigrants. Our analysis by education group will establish these effects.

7.1 Effect on Native Wages by Education Groups

We show in Table 11 the estimated coefficient when the dependent variable is, alternatively, the logarithm of hourly wages for highly educated natives (Panel A), for middle educated natives (Panel B) or for less educated natives (Panel C).[40] The different rows of the table show the 2SLS estimated coefficients and standard errors when using the interactions of the BR dummy with the Phase 1 and Phase 2 dummies as instruments (Row 1) or when using only the interaction of BR with one dummy for the whole 2000-2010 period (Row 2).[41] The estimated coefficients capture the percentage change in wages in response to an influx of new immigrants by one percentage point of employment. Different specifications use municipalities (Columns 1-4) or commuting zones (Columns 5-8) as units of analysis. These regression include only year and area fixed effects in Columns 1 and 5, add the Bartik instrument in Columns 2 and 6, and then add additional demographic controls in Columns 3 and 7. Finally, in specifications 4 and 8, we use regression-adjusted wages, after controlling for individual characteristics, to construct the averages. The overall results indicate effects of immigrants on the wages of middle and less educated natives that are not significantly different from zero. To the contrary, the effects are positive and sometimes significant on wages of highly educated natives when considering municipalities as units. When considering commuting zones, even the effects on highly educated natives are not significant. The estimates of Column 4 are the most conservative as they include all controls and use the cleaned wage as the dependent variable. They indicate that for an increase of new immigrants by 1 percent of employment, the wages of high skilled natives increase by 0.51%, while middle and less educated native wages experience a non-statistically significant decrease between 0.1 and 0.4%.

[40] The results for earlier immigrants are presented in appendix Table A3.

[41] To control for industry driven and education specific demand shocks, we use the education group specific Bartik when indicated.

Using our preferred estimate of the effect of policies on the inflow of new immigrants (Appendix Table A2, Column 3), the estimates of Column 4 in Table 10 imply that over the 1998-2010 period, when new immigrants grew by 4 percentage points of employment in BR relative to NBR, native highly educated workers experienced a wage gain of 2.1 percentage points (0.513×4) compared to highly educated natives in the NBR, while the other groups of natives did not experience any significant change.

7.2 Displacement of Natives by Education Groups

We analyze next the effect of immigrants on native employment by education group using a similar framework. Our analysis follows the same structure used above to study the wage effects of new immigrants. Specifically, we estimate equation (5) using log total hours worked by natives in an education group and area as the dependent variable. Table 12 shows the estimates, separating highly educated (Panel A), middle educated (Panel B) and less educated (Panel C). Different specifications across columns adopt different geographical units (municipalities in Columns 1-3 and commuting zones in Columns 4-6) and include different controls. The estimates show mostly small and insignificant effects of immigrants on native labor supply of high and less educated natives. However, for the medium educated we observe significant displacement. This group is loosing between 1.8 and 3 percent of hours worked for each one percent of employment increase in new immigrants. Table A4 shows similar effects for earlier immigrants: Those with an intermediate level of education saw a significant effect on displacement, while no significant effects are estimated on the other two education groups.

Overall, new immigrants positively affected the wage of highly educated natives while not affecting their employment. However, some degree of displacement is observed for natives in the middle educated native group in response to immigration, as they reduced their working hours in response to immigration. Less educated natives were not significantly affected by immigrants either in their wages or employment.

These result are interesting and somewhat surprising. The immigrants, many of whom were highly educated, appear to be more complementary to highly educated natives (positive wage effect) than to middle educated natives (negative employment effect). Moreover, in the light of the larger inflow of low educated immigrants relative to middle-educated immigrants produced by Phase 2 of the reform (as established in section 5.2), the displacement effect on middle educated natives is hard to explain using a traditional model. The displacement and

wage effects, in fact, are not consistent with a simple model of workers with three different skills (low, medium and high education) providing differentiated inputs that are complementary to each other. One explanation could be that immigrants stimulate, as in Lewis (2011), the adoption of capital and technology that are skill-complementary, and hence reverse the pure substitution effect. Alternatively, it may be because they foster specialization within the group of highly educated natives that enhances their complementarity with them, as suggested in Peri & Sparber (2011), while among middle educated this response does not take place. To follow up on this hypothesis, we analyze the task and occupational response of natives.

7.3 Mobility Across Management Levels and Job Tasks

One potential channel through which immigrants may help highly educated natives is by encouraging them to move into jobs in which they are more complementary to newly arriving immigrants (Lewis & Peri, 2014). Previous studies, such as Peri & Sparber (2009), D'Amuri & Peri (2014) and Foged & Peri (2013), point out that low-skilled natives - who are particularly exposed to potential competition from low educated immigrants - have moved from manual intensive occupations to more communication intensive occupations, where they have a comparative advantage, vis-a-vis immigrants. A similar mechanism may also take place on the other side of the skill spectrum among the highly educated. For the U.S., Peri & Sparber (2011) show that immigrants with a college degree are particularly concentrated in STEM occupations (science, technology, engineering and math), while natives specialize in supervisory, managerial and interactive types of occupations. In addition, they moved more towards those occupations as immigrant competition increased. It is not clear, ex-ante, whether a similar mechanism of native sorting is induced by immigration in Switzerland, as immigrants mostly come from neighboring countries with potentially the same language background as natives.[42] Certainly, even knowing the language, some jobs with high ''country specific'' content may be easier for Swiss to navigate, creating comparative advantages and complementarity.

We can test this hypothesis in the Swiss case by using additional information from our data. We distinguish between four categories of workers, depending on their managerial role in a firm. Specifically, we divide workers into four categories depending on their ''management rank'': *no management*, *lower management*, *intermediate management* and *highest management*. First, we

[42]Unsurprisingly, inspecting the data reveals a large share of new immigrants choose to work in regions with a similar language background to their country of origin: In 2010, 94% and 95% of resident immigrants from Austria and Germany, respectively, worked in the German-speaking area of Switzerland, 78% of immigrants from France worked in the French-speaking area, whereas Italians were a little bit more evenly distributed: 38% worked in the Italian-speaking part of Switzerland, while 40% and 20% in the German- and French-speaking parts, respectively. This pattern is even more pronounced among cross-border workers, see Appendix Table A1.

investigate whether, and how, the share of workers in different positions in the management ladder within a given education group responds to immigration. If a group of natives responded to larger inflows of new immigrants by moving up the hierarchical ladder, then we should expect the share of workers in high management positions to increase, while the share of lower management positions should decrease. To analyze this channel, we estimate equation (5) with a single interaction term for the entire post-1999 phase as an instrument, using the share of workers from an education group in a certain management level as the dependent variable. We run separate regressions for each of the four management levels (no management, low, intermediate and high management). Table 13 presents these estimates for natives.

Each entry in this table represents a coefficient from a separate regression. Columns 1-4 (Columns 5 to 8) use specifications with different sets of controls and the units of observations are the municipalities (commuting zones). The first row of estimates in Panel A of Table 13 shows the effect of new immigrants on the share of workers in *high management* positions among highly educated natives. The second, third and fourth rows do the same exercise with the share in intermediate, low or no management positions as the dependent variable, respectively.[43] The results indicate that a one percentage point increase in the employment share of new immigrants produced a 0.7 to 1.2 percentage point increase in the share of workers in high management positions among highly educated natives. This is a sizable effect, suggesting the 4 percentage points higher immigrant exposure in the border region lead to an increase by 4.8 percentage points in the share of highly educated native workers in high management positions. As the average share of highly educated in top management jobs was 0.22 in 1998 (these average shares are reported in the first column of the table under the group name), new immigrants have increased the top management group among highly educated natives by more than 20% of its size relative to the other groups. There are no significant effects on the intermediate hierarchy groups, but the point estimates suggest the gain in the top management group comes at the expenses of the lower hierarchy groups. Hence immigrants, potentially taking jobs at the ''low end'' of the management ladder among highly educated natives, push natives up the ladder, producing the positive occupation and wage effects we found earlier.

Panel B shows that for middle educated natives there was no equally strong push towards managerial upgrade produced by immigrant competition. While it appears immigration pushed some middle educated natives out of ''no-management'' jobs, there are some gains among the low and intermediate management positions these effects are mostly not significant, and no

[43]Note that the coefficients across management groups add up to zero, as these are mutually exclusive and exhaustive groups.

effect on the top management group is detectable. Finally, among less educated natives (Panel C), there is some evidence upward pressure into intermediate management positions might have come from immigrants. However, the number of less educated in these jobs is so small that, overall, this might have been a negligible effect. In the case of earlier immigrants, the point estimates are very similar to those of natives, but most coefficients are not significantly different from zero. These estimates of the effect on management levels are reported in appendix Table A5 for completeness.

In addition, our data also contains information about how ''challenging'' the job tasks and requirements are for each worker. The data distinguish between three categories of jobs, ranging from only requiring ''simple and repetitive tasks'' to those involving ''intermediate tasks'' and finally those requiring ''complex tasks''.[44] We then analyze the set of production tasks that native workers of different education groups typically perform and what effect new immigrants had on them. In this case the dependent variable is the share of workers in jobs with *complex*, *intermediate* or *simple* task requirement within a given education group of native workers. These estimates are presented in Table 14, which is organized similarly to the previous table, and has also shows three panels and eight columns.[45] The estimates in Panel A show that immigrant exposure had no significant effect on the distribution of tasks among highly educated workers. However, among middle educated workers, shown in Panel B, there are significant effects. These estimates suggest a one percentage point increase in immigrant exposure reduced the share of middle educated natives working on intermediate tasks by 1.2 to 1.7 percentage points and increased the share working on simple tasks by a similar amount. Quantitatively, this translates into a 4.8 to 6.8 percentage point loss (gain) in the share of workers doing intermediate (routine) tasks among middle educated natives. As only 12% of workers with middle education were employed in these 'simple' tasks in 1998, this is a substantial effect from immigration, generating a ''downgrading'' of natives with intermediate schooling levels. For high and low educated workers (Panel A and C), results are mostly insignificant.

Overall the results of this subsection suggest an interesting and consistent effect from immigrants. While immigrants are highly educated, their lack of Swiss-specific skills could position them in qualified jobs, but at the low-end of the managerial spectrum in Swiss firms. This implies

[44]The intermediate category is a combination of ''job requiring occupational knowledge'', and ''job requiring autonomous and qualified working'', whereas complex tasks are those defined as jobs requiring ''highly challenging and difficult tasks''.

[45]The corresponding results for the effect of new immigrants on earlier immigrants' job complexity are reported in appendix Table A6 for completeness.

highly educated native workers were able to escape competition from similarly educated new immigrants and benefited from their task specialization by climbing up the managerial ladder. In fact, the presence of highly educated foreigners, probably skilled but not very well equipped to manage Swiss firms, may have increased the demand for managerial skills provided by natives. Highly skilled natives may have been the best positioned to supply these important, highly paid and immigrant-complementary skills. Hence, their positive wage effect with no displacement is a consequence of skill complementarity. At the other end of the spectrum, less educated natives were not affected much in terms of competition or complementarity by skilled immigrants and neither changed their specialization nor experienced significant wage and employment effects. Among natives with intermediate education, however, we may find the group that lost out due to competition form immigrants. Their skills may be more easily replaced by the skills of new immigrants, and as they did not move up in management, this group is the one that did not gain in terms of wage, and may have experienced some displacement.

The analysis and results of this section emphasize how immigrants may generate winners and losers among natives, but that the specific characteristics of each group depend on the specific tasks and jobs performed (besides education). Moreover, sometimes the group of natives most similar to immigrants in terms of education is not the one that experienced the strongest competition because of the different task/occupational choice of immigrants. Our analysis emphasizes the importance of looking at subgroups and mechanisms of specialization in order to understand the effect of immigrants on native labor market outcomes.

8 Conclusion

What is the effect of reducing immigration restrictions on the inflow of immigrants, and what are the economic consequences for natives? These are very important questions on which we have little direct evidence: we simply do not have examples of countries that adopted different policies for their regions in a framework that allows a causal analysis.

In this paper, we exploit Switzerland's integration into the European labor market after 1999, which accidentally created an excellent environment to study the causal effect of removing immigration restrictions using a difference-in-difference design. The Swiss case features two different parts of the country experiencing different timing in the implementation of the free movement policy for EU workers between 1999 and 2007. In particular, between 2004 and 2007, we have two parts of the country that found themselves under very different immigration regimes for a group of workers. Access to labor markets by cross-border workers (CBW), which

are foreign workers commuting to work from a neighboring country (Italy, France, Germany or Austria), were fully liberalized in the Swiss border region as of 2004, while those workers were not allowed to work in the rest of the country until 2007. This created a period between 1999 and 2004 in which the border region was increasingly more open to immigrants from the EU, culminating in the 2004-2007 period during which the border region was fully open to cross-border workers and the non-border region was not.

We leverage this differential degree of openness of the border region relative to the non-border region to analyze the effect of policy changes on the inflow of new immigrants in a difference-in-difference framework, adopting a short- and long-run perspective. This analysis reveals that opening the border caused an influx of new immigrants equal to 3 to 4 percentage points of employment over 3-4 years. Most of the differential increase in the share of new immigrants took place after 2004, when the BR was fully liberalized. We also find that it persisted after 2007, when immigration restrictions were abolished for all EU immigrants (CBW and RI) in both regions.

We exploit the same differential policy treatment of the border and non-border regions to analyze the consequences for natives and earlier immigrant workers in the labor market. These results suggest average wages for both groups were not affected by the liberalization of labor movements and the subsequent inflow of new immigrants. In addition, we do not find evidence of displacement of average native workers. There is some evidence that earlier immigrants might have suffered some displacement on average. When we analyze these affects by education groups, however, we find evidence that highly educated natives benefited from immigration in terms of higher wages, while middle educated natives experienced displacement, while less educated natives were unaffected. A subsequent analysis of the management level and task content of native workers' jobs shows the immigration inflow pushed a larger share of highly educated natives to work in top management positions, as immigrants may have created higher demand for such roles. This helps to explain why this group of workers benefited the most from the inflow of immigrants. On the other hand, we find evidence that a larger share of middle educated natives was induced to leave jobs requiring professional know-how for jobs with simpler and more repetitive tasks. This may be responsible for the mild displacement suffered by this group. With foreign born workers taking intermediate technical jobs, natives in those jobs might have been partly displaced to more routine based, lower pay jobs.

While the effect of immigration on the beneficial re-sorting of highly educated natives has also been documented in existing academic literature, there is less evidence for the negative effect we

find on middle educated natives in terms of displacement and re-sorting into less attractive jobs. The reason for this might be a peculiar feature of Swiss immigrants, among which most speak one of the country's three dominant languages and sort overwhelmingly into areas where they can use this skill. This may increase their similarity with native workers and their competition with them.

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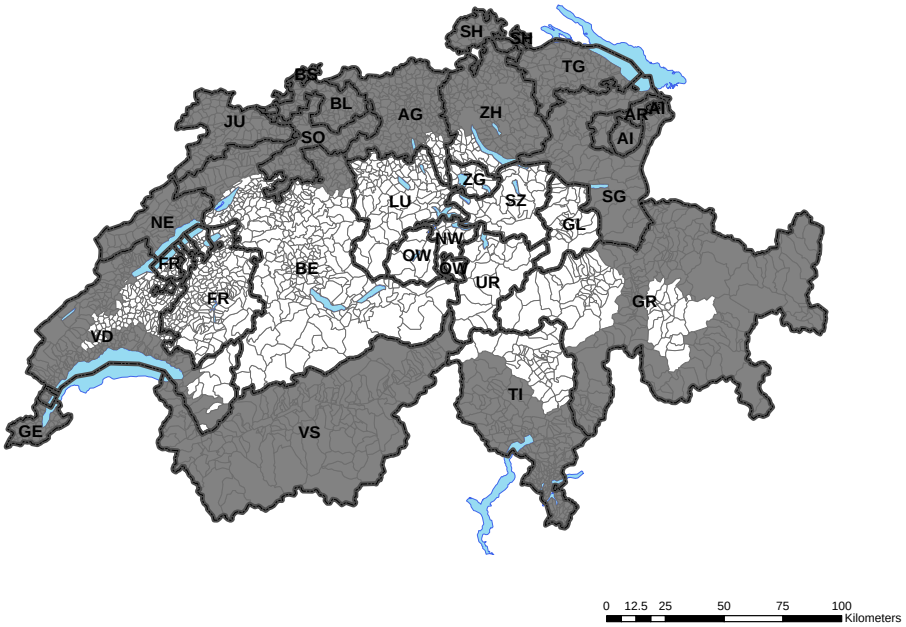
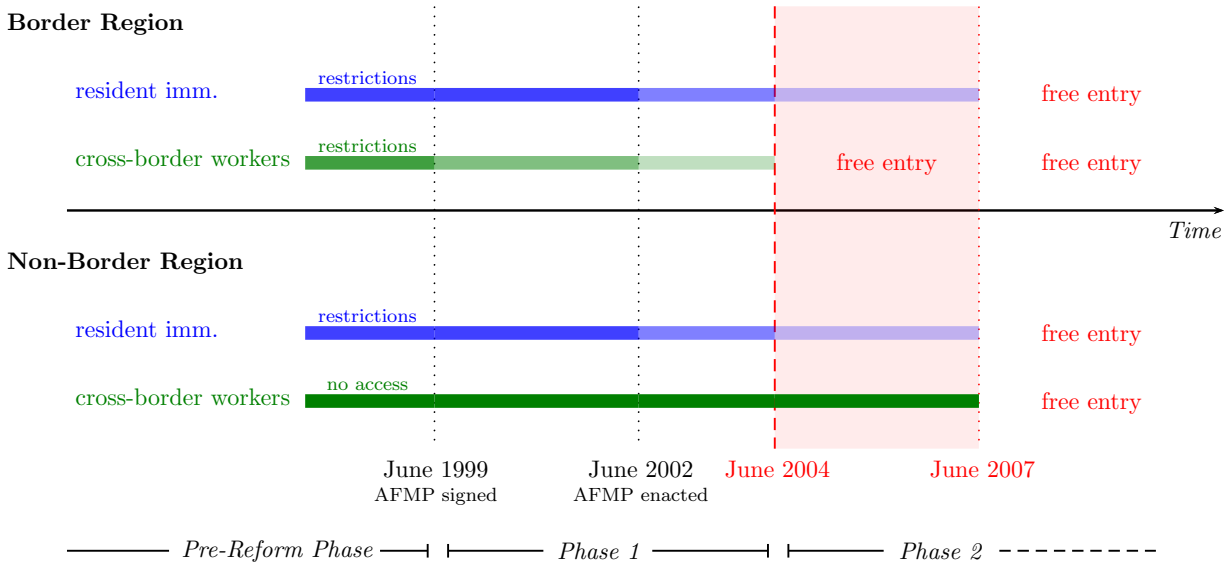
Figure 1: Municipalities in the Border Region (gray) and in the Non-Border Region (white) and Cantonal Borders (black lines and letters)



Notes: Municipalities in the border region are indicated in gray and those in the interior region in white. The black lines and letters denote cantonal borders and abbreviations, respectively. Note that border regions do not overlap completely with cantonal borders.

Figure 2: Labor Market Integration With Two Different Schedules for the Border Region and the Non-Border Region



Notes: Colored bars denote entry restrictions for resident immigrants (RI, blue) and cross-border workers (CBW, green) from EU17 countries. Bars in lighter colors indicating facilitated entry for a type of immigrant workers relative to the state prior to 1999 (cf. section 3 for details). Access was facilitated for both types of immigrants (CBW and RI) after 1999, but more and earlier for CBW to the BR while they had no access to the NBR. The complete abolishment of entry restrictions for CBW to the BR in 2004 and for both types of immigrants to both regions (BR and NBR) in 2007 is indicated with "free entry". These policy changes resulted in a gradually larger openness of the BR to immigration (with a maximum between 2004 and 2007) because CBW had only access to the BR but not to the NBR prior to 2007 and changes for RI affected both regions equally.

Table 1: Characteristics of Natives and New Immigrants, 1998 and 2010

	Natives			New immigrants		
	1998	2010	Change	1998	2010	Change
Demographic characteristics						
Share highly educated	0.189	0.248	0.059	0.159	0.300	0.141
Share middle educated	0.670	0.646	-0.024	0.379	0.406	0.027
Share low educated	0.141	0.106	-0.035	0.462	0.294	-0.167
Mean age	39.505	41.097	1.591	36.568	37.753	1.185
Mean tenure	8.291	8.199	-0.092	5.754	4.852	-0.902
Share male	0.598	0.543	-0.055	0.679	0.630	-0.048
Mean log hourly real wage	3.543	3.581	0.038	3.368	3.507	0.139
Mean full time equivalent	0.877	0.826	-0.051	0.945	0.911	-0.035
Total number of workers	1,431,409	1,780,690	349,281	212,366	390,216	177,850
Sample observations	248,037	823,306	575,269	33,211	182,983	149,772
Occupation shares (ranked by mean wage in 1998)						
Management	0.034	0.034	0.000	0.015	0.021	0.006
Evaluation/Consultancy/Certification	0.051	0.064	**0.014**	0.019	0.050	**0.031**
Analysis/Programming/Operating	0.027	0.032	0.004	0.028	0.041	**0.013**
R&D	0.016	0.017	0.001	0.030	0.040	**0.010**
Education	0.021	0.029	**0.007**	0.009	0.019	0.009
Trade	0.020	0.019	-0.001	0.007	0.012	0.005
Logistics	0.024	0.023	-0.001	0.015	0.020	0.005
Planning/Design	0.043	0.038	**-0.005**	0.022	0.033	**0.011**
Accounting/HR	0.058	0.056	-0.002	0.020	0.030	0.010
Culture/Information/Recreation	0.011	0.020	**0.009**	0.005	0.012	0.007
OtherAdmin	**0.083**	**0.073**	**-0.009**	0.036	0.052	**0.015**
Security	0.004	0.010	0.006	0.002	0.004	0.002
Machinery	0.065	0.061	-0.004	0.047	**0.055**	0.008
Administration/Clerks	**0.078**	0.054	**-0.024**	0.019	0.024	0.005
Construction	**0.075**	**0.067**	**-0.008**	**0.155**	**0.117**	**-0.038**
Medical/Nursing	0.056	**0.084**	0.028	0.043	0.051	0.008
Transport	0.046	0.042	-0.003	**0.053**	0.037	**-0.016**
Manufacturing/Processing	**0.125**	**0.095**	**-0.031**	**0.237**	**0.152**	**-0.086**
Restoration/Craft	0.002	0.001	0.000	0.001	0.002	0.002
Retail	**0.098**	**0.099**	0.001	**0.049**	**0.055**	0.006
Cleaning	0.012	0.021	**0.009**	0.020	0.047	**0.027**
Hotel/Catering	0.048	0.055	**0.007**	**0.160**	**0.120**	**-0.040**
Body/Textile Services	0.005	0.007	0.002	0.008	0.007	**-0.002**
Industry group shares						
Agriculture/Fishing/Mining	0.004	0.007	0.003	0.005	0.007	0.002
Manufacturing	**0.262**	**0.209**	**-0.053**	**0.337**	**0.266**	**-0.070**
Utilities	0.007	0.008	0.001	0.001	0.002	0.001
Construction	0.079	0.075	-0.004	**0.151**	0.113	**-0.038**
Wholesale/Retail/Repair	**0.212**	**0.204**	-0.008	0.125	**0.143**	**0.018**
Hotels/Restaurants	0.044	0.047	0.003	**0.157**	0.116	**-0.041**
Transport/Communication/Storage	0.063	0.047	**-0.015**	0.048	0.042	-0.006
Financial Intermediation	0.095	0.074	**-0.021**	0.026	0.034	0.008
Real Estate/R&D/IT/Business activities	**0.105**	0.137	**0.032**	0.062	**0.160**	**0.098**
Education/Health	0.100	**0.150**	**0.049**	0.065	0.086	**0.021**
Personal Services	0.029	0.042	**0.013**	0.022	0.030	0.008

Notes: Occupations are ranked by the main log hourly wage in 1998. Occupations with the top 5 largest shares by year and the top 5 and bottom 5 gains and losses, respectively, are marked bold. Similarly, industry with the top 3 largest shares and the top and bottom 3 largest gains and losses, respectively, are marked in bold. See definitions in section 4. SESS data.

Table 2: Regional Characteristics in 1998

	Border region	Non-border region
Demographics characteristics		
Share highly educated	0.178	0.150
Share middle educated	0.585	0.616
Share low educated	0.237	0.234
Mean age	39.4	38.7
Mean tenure	8.017	8.085
Share male	0.618	0.608
Mean log hourly wage	3.515	3.454
Mean full time equivalent	0.896	0.873
Industry group shares		
Agriculture/Fishing/Mining	0.004	0.003
Manufacturing	0.292	0.258
Utilities	0.005	0.005
Construction	0.089	0.123
Wholesale/Retail/Repair	0.185	0.224
Hotels/Restaurants	0.055	0.081
Transport/Communication/Storage	0.055	0.056
Financial Intermediation	0.087	0.058
Real Estate/R&D/IT/Business activities	0.102	0.077
Education/Health	0.096	0.087
Personal Services	0.029	0.027
Geography characteristics		
Share urban	0.867	0.732
# Cities with population $\geq$ 50k	7	2
Share mountainous	0.248	0.430
Mean driving time (min) to border crossing	29.3	62.8
Share German speaking	0.679	0.898
Share French speaking	0.263	0.090
Share Italian/Romansh speaking	0.058	0.011
Mean municipality size (workforce)	1214	852
Nr workers	1,463,422	497,469
Nr observations	249,155	83,106

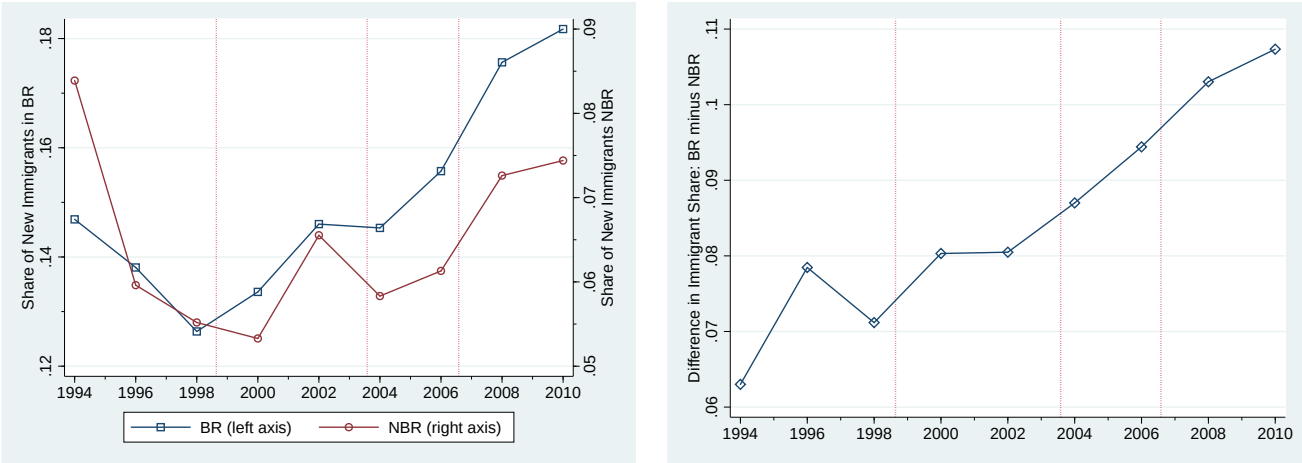
Notes: See definitions in section 4 for demographic characteristics and industry shares of SESS data in 1998. Distance data are taken from search.ch map data. Geography characteristics are taken from Schuler et al. (2005) using the municipality code of each observation in the SESS data.

Table 3: Characteristics of Cross-Border Workers and Resident Immigrants in the Border Region in 1998 and 2010

	Cross-border workers			Resident immigrants		
	1998	2010	Change	1998	2010	Change
Demographic characteristics						
Share highly educated	0.153	0.279	0.126	0.185	0.337	0.152
Share middle educated	0.513	0.490	-0.024	0.253	0.317	0.064
Share low educated	0.334	0.232	-0.102	0.562	0.346	-0.216
Mean age	39.660	40.457	0.797	33.722	35.424	1.702
Mean tenure	8.670	7.213	-1.457	2.879	2.906	0.026
Share male	0.693	0.660	-0.033	0.665	0.598	-0.067
Mean log hourly real wage	3.455	3.536	0.081	3.305	3.491	0.186
Mean full time equivalent	0.956	0.936	-0.020	0.933	0.885	-0.048
Total number of workers	103,863	175,206	71,343	81,050	167,021	85,971
Origin country shares						
Austria	0.051	0.030	-0.021	0.032	0.026	-0.006
France	0.504	0.494	-0.010	0.138	0.115	-0.023
Italy	0.226	0.237	0.011	0.092	0.087	-0.006
Germany	0.209	0.209	0.000	0.252	0.356	0.104
Share on total immigrant group	0.990	0.970		0.514	0.584	

Notes: Demographic characteristics are calculated using SESS data. The origin country shares of the four neighbouring countries were calculated using the national Census in 2000 and 2010 to 2012 in the case of RI and using data on CBW from the FSO in 1998 and 2010 (the official name for this dataset is "Grenzgängerstatistik"). Note that an 'origin country' is the nationality of a worker in the CBW data whereas it is the country of birth in the Census. Furthermore, in the Census new resident immigrants are defined as individuals having not lived in Switzerland 5 years ago as in Beerli & Indergand (2014).

Figure 3: Evolution of the Share of New Immigrants (Left Panel) and the Difference in New Immigrant Shares Between Border Region and Non-Border Region (Right Panel)



Notes: New immigrants are the sum of cross-border workers and resident immigrants. The left panel plots the evolution of the share of new immigrants on the total workforce in the border region (BR, left y-axis) and the same share in the non-border region (NBR, right y-axis). The right panel plots the difference in the share of new immigrants between both regions, $(IM_{BR,t}/TOTEMP_{BR,t}) - (IM_{NBR,t}/TOTEMP_{NBR,t})$. Vertical lines indicate June 21 1999, when the agreement was signed, June 1 2004, when the labor markets of the border region and the non-border were liberalised differentially, and and June 1 in 2007, when the differential openness of the border region ended. Note that years indicate the labor market situation by October 31 of the corresponding wave.

Table 4: Effect of the Opening Immigration Policy on the Share of New Immigrants on Total Employment

Dependent variable: Share of new immigrants on total employment

Area level	Municipality			Commuting zone		
	(1)	(2)	(3)	(4)	(5)	(6)
$BR_m \cdot I(2000 \leq year < 2004)$	0.00950	0.00904	0.0113	0.00927	0.00982	0.0120
	[0.00468]*	[0.00539]	[0.00515]**	[0.00447]**	[0.00497]*	[0.00477]**
$BR_m \cdot I(2004 \leq year \leq 2010)$	0.0274	0.0265	0.0295	0.0281	0.0282	0.0309
	[0.00997]**	[0.0102]**	[0.00964]***	[0.00981]***	[0.0101]**	[0.00958]***
BR_m	0.0709			0.0732		
	[0.0277]**			[0.0273]**		
$\ln \widetilde{EMP}_{m,t}^{Total}$			0.154			0.138
			[0.0585]**			[0.0600]**
Year fixed effects	√	√	√	√	√	√
Area fixed effects		√	√		√	√
Observations	12,801	12,801	12,795	948	948	945
R-squared	0.117	0.850	0.852	0.163	0.943	0.945

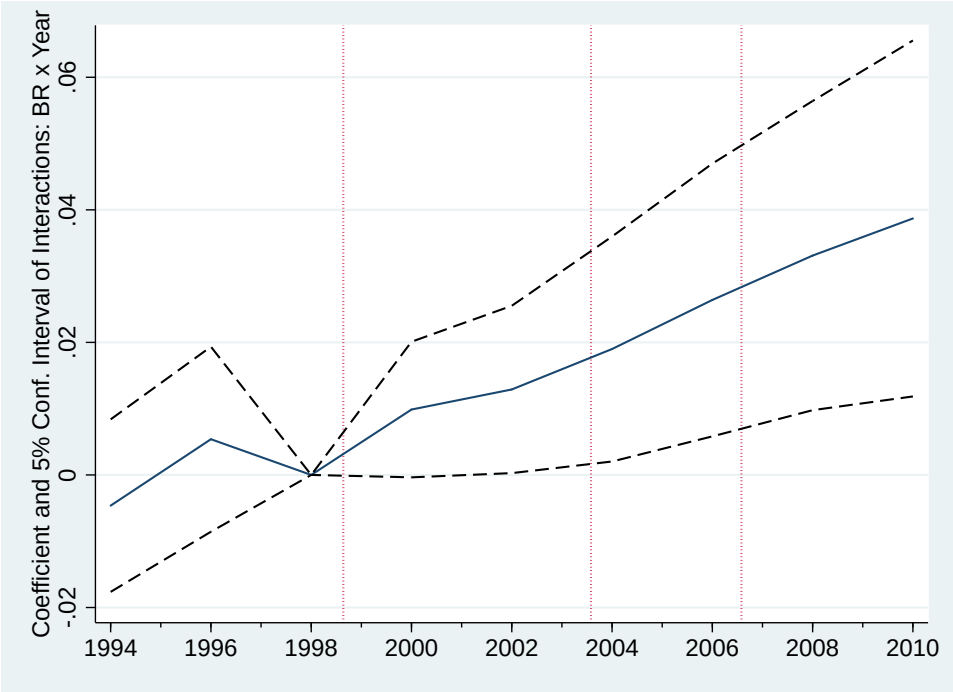
Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. BR_m is one for municipalities (commuting zones) in the border region. $I(2000 \leq year < 2004)$ and $I(2004 \leq year \leq 2014)$ are dummies for the differential opening in *Phase 1*, from 1999 to 2004, and *Phase 2*, from 2004 to 2010, respectively. $\widetilde{EMP}_{m,t}^{Total}$ denotes the Bartik measure controlling for local, industry driven demand shifts as defined in the text. Regressions are weighted using the total workforce of cells.

Table 5: Effect of Opening Immigration Policy on the Skill Composition of Immigrants

Area level	Municipality			Commuting zone		
	(1)	(2)	(3)	(4)	(5)	(6)
A. Dependent variable: Share of highly educated among new immigrants						
$BR_m \cdot I(2000 \leq year < 2004)$	0.00633	-0.00932	-0.00787	0.00155	-0.00252	-0.000790
	[0.0188]	[0.0112]	[0.0117]	[0.0226]	[0.0246]	[0.0251]
$BR_m \cdot I(2004 \leq year \leq 2010)$	0.00884	0.00776	0.00930	-0.00290	-0.00143	0.000304
	[0.0252]	[0.0158]	[0.0152]	[0.0280]	[0.0212]	[0.0208]
BR_m	0.0504			0.0439		
	[0.0237]**			[0.0253]*		
Observations	12,253	12,253	12,248	946	946	943
R-squared	0.134	0.721	0.721	0.237	0.888	0.889
B. Dependent variable: Share of middle educated among new immigrants						
$BR_m \cdot I(2000 \leq year < 2004)$	-0.000471	-0.00766	-0.0112	0.00371	0.00761	0.00367
	[0.0136]	[0.0172]	[0.0184]	[0.0161]	[0.0169]	[0.0180]
$BR_m \cdot I(2004 \leq year \leq 2010)$	-0.118	-0.106	-0.110	-0.111	-0.104	-0.108
	[0.0257]***	[0.0317]***	[0.0311]***	[0.0286]***	[0.0302]***	[0.0299]***
BR_m	0.154			0.151		
	[0.0392]***			[0.0387]***		
Observations	12,253	12,253	12,248	946	946	943
R-squared	0.074	0.579	0.580	0.149	0.778	0.780
C. Dependent variable: Share of low educated among new immigrants						
$BR_m \cdot I(2000 \leq year < 2004)$	-0.00586	0.0170	0.0191	-0.00526	-0.00509	-0.00288
	[0.0228]	[0.0172]	[0.0175]	[0.0248]	[0.0276]	[0.0273]
$BR_m \cdot I(2004 \leq year \leq 2010)$	0.109	0.0986	0.101	0.114	0.105	0.108
	[0.0287]***	[0.0304]***	[0.0307]***	[0.0308]***	[0.0296]***	[0.0300]***
BR_m	-0.204			-0.195		
	[0.0565]***			[0.0576]***		
Observations	12,253	12,253	12,248	946	946	943
R-squared	0.181	0.718	0.719	0.286	0.894	0.894
Year fixed effects	√	√	√	√	√	√
Area fixed effects		√	√		√	√
Bartik			√			√

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. BR_m is one for municipalities (commuting zones) in the border region. $I(2000 \leq year < 2004)$ and $I(2004 \leq year \leq 2014)$ are dummies for the differential opening in *Phase 1*, from 1999 to 2004, and *Phase 2*, from 2004 to 2010, respectively. In each panel, the third and sixth column include the log of the education specific Barite control as specified in the text. Regressions are weighted using the total number of new immigrants of cells.

Figure 4: Differential Evolution of the Share of New Immigrants Between Border Region and Non-Border Region, Coefficients and 5%-Confidence Intervals (Base Year = 1998)



Notes: The figure plots coefficients (straight line) and the 5%-confidence interval (dashed lines) of an estimate of equation (3) including municipality and year fixed effects and the Bartik control, shown in column 3 of appendix table A2. Vertical lines indicate June 21 1999, when the agreement was signed, June 1 2004, when the labor markets of the border region and the non-border were liberalised differentially, and and June 1 in 2007, when the differential openness of the border region ended. Note that years indicate the labor market situation by October 31 of the corresponding wave.

Table 6: Robustness of Effect of Opening Immigration Policy on the Share of New Immigrants on Total Employment

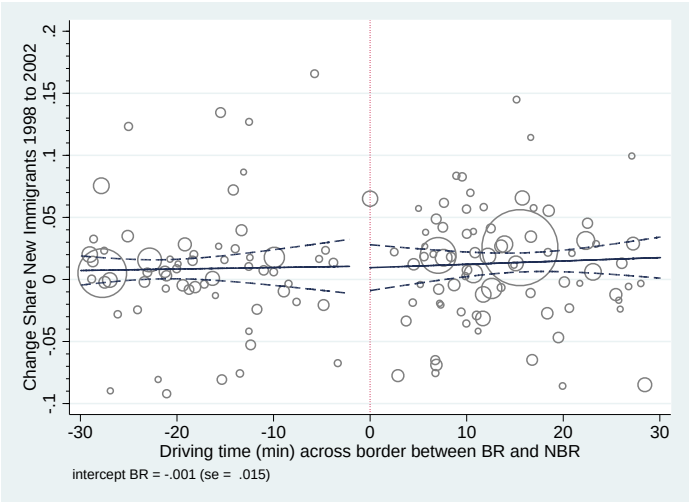
Dependent variable: Share of new immigrant on total employment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$BR_m \cdot I(2000 \leq year < 2004)$	0.0113	0.00155	0.00490	0.0126	3.53e-06	0.0144	0.00837	0.00994	0.0232	0.00988	0.0190	-0.0217
	[0.00515]**	[0.0128]	[0.00546]	[0.00523]**	[0.0117]	[0.0105]	[0.00660]	[0.00384]**	[0.00571]***	[0.00621]	[0.00344]***	[0.00779]**
$BR_m \cdot I(2004 \leq year \leq 2010)$	0.0295	0.0213	0.0250	0.0322	0.00631	0.0404	0.0201	0.0273	0.0158	0.0149	0.0638	0.0301
	[0.00964]***	[[0.00757]**	[0.0103]**	[0.00996]***	[0.0148]	[0.0206]*	[0.0109]*	[0.00694]***	[0.0251]	[0.0106]	[0.0135]***	[0.00823]***
Sample BR	all	at BRB	w/o top7 cities	urban	rural	BC<20min	BC 20-40min	BC 40-60min	BC>60min	G-speaking	F-speaking	I/R-speaking
Sample NBR	all	at BRB	all	urban	rural	all	all	all	all	all	all	all
Year/Area fixed effects	√	√	√	√	√	√	√	√	√	√	√	√
Bartik	√	√	√	√	√	√	√	√	√	√	√	√
Observations	12,795	2,024	12,722	6,408	6,387	6,444	7,892	5,995	4,176	9,284	6,416	4,903
R-squared	0.852	0.723	0.837	0.885	0.743	0.876	0.703	0.604	0.607	0.790	0.837	0.879

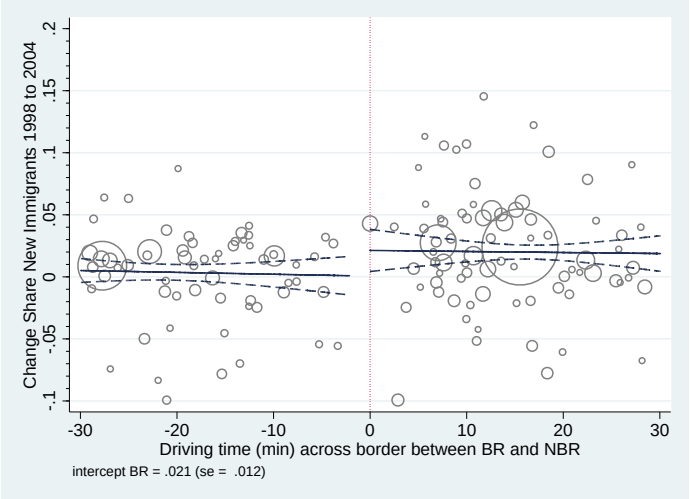
Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. BR_m is one for municipalities (commuting zones) in the border region. $I(2000 \leq year < 2004)$ and $I(2004 \leq year \leq 2010)$ are dummies for the differential opening in *Phase 1*, from 1999 to 2004, and *Phase 2*, from 2004 to 2010, respectively. Regressions are weighted using the total workforce of cells. Distance data are taken from search.ch map data.

Figure 5: Change in Share of New Immigrants at the Border between Border Region and Non-Border Region

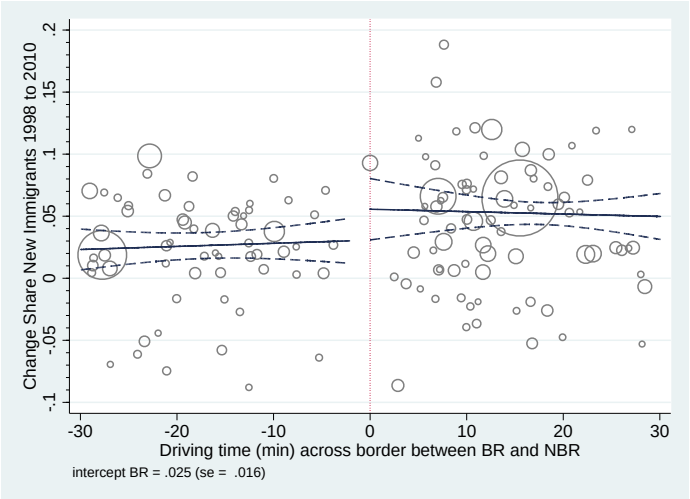
A. Change in share of new immigrants between 1998 and 2002



B. Change in share of new immigrants between 1998 and 2004



C. Change in share of new immigrants between 1998 and 2010



Notes: Scatterplot of change in immigrant share between 1998 and specified year of each municipalities against commuting time (in minutes) to the border between border and non-border region by car. Only municipalities within 30 minutes commuting time. Positive (negative) distances indicate values for municipalities in the border (non-border) region. The size of the circle reflects the size of the total labor force in 1998. Municipalities with total employment below 1000 workers are not plotted but included in the regressions. The straight (dashed) lines represent the predicted average change in immigrant exposure (10% confidence interval) from the following model for year t: $\Delta^t_{1998}\left(IM_m/TOTEMP_m\right) = \alpha^t + \beta^t_1 BR_m + \beta^t_2 distance_m + \beta^t_3 distance_m \times BR_m + \epsilon_{m,t}$. An estimate of β^t_1 is shown below each figure. See section 5.3.2 for more details. SESS data. Distance data are taken from search.ch map data.

Table 7: Effect of the Opening Immigration Policy on Wage Levels of Natives and Earlier Immigrants

Area level	Municipality				Commuting zone			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Dependent variable: Average log hourly wages of natives								
$BR_m \cdot I(2000 \leq year < 2004)$	-0.00239	-0.00240	0.00220	0.00161	0.00110	0.00104	0.00406	0.00503
	[0.00610]	[0.00623]	[0.00536]	[0.00591]	[0.00716]	[0.00722]	[0.00468]	[0.00538]
$BR_m \cdot I(2004 \leq year \leq 2010)$	-0.00839	-0.00668	-0.00310	-0.00469	-0.00869	-0.00745	-0.000961	-0.00638
	[0.0125]	[0.0102]	[0.00538]	[0.00576]	[0.0120]	[0.00978]	[0.00385]	[0.00549]
Observations	17,664	17,654	17,480	17,535	949	945	945	945
R-squared	0.761	0.762	0.860	0.754	0.920	0.920	0.963	0.933
B. Dependent variable: Average log hourly wages of earlier immigrants								
$BR_m \cdot I(2000 \leq year < 2004)$	0.00278	0.00241	-0.00295	-0.00212	0.00419	0.00373	-0.00463	-0.00172
	[0.00770]	[0.00758]	[0.00423]	[0.00407]	[0.00694]	[0.00677]	[0.00378]	[0.00456]
$BR_m \cdot I(2004 \leq year \leq 2010)$	0.0100	0.00759	-0.00367	-0.00382	0.00970	0.00603	-0.00442	-0.00467
	[0.0122]	[0.0110]	[0.00774]	[0.00768]	[0.0114]	[0.0101]	[0.00685]	[0.00681]
Observations	12,796	12,790	12,541	12,629	948	945	945	945
R-squared	0.624	0.624	0.788	0.563	0.846	0.848	0.920	0.821
Year/Area fixed effects	√	√	√	√	√	√	√	√
Bartik		√	√	√		√	√	√
Demo. controls			√	Adj. $y_{m,t}$			√	Adj. $y_{m,t}$

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. BR_m is one for municipalities (commuting zones) in the border region. $I(2000 \leq year < 2004)$ and $I(2004 \leq year \leq 2010)$ are dummies for the differential opening in *Phase 1*, from 1999 to 2004, and *Phase 2*, from 2004 to 2010, respectively. Regressions are weighted using the total workforce of cells.

Table 8: Effect of New Immigrants on Wage Levels of Natives and Earlier Immigrants, 2SLS Estimates

Area level	Municipality				Commuting zone			
Instrument(s)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Dependent variable: Average log hourly wages of natives								
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	-0.365	-0.204	-0.126	-0.188	-0.371	-0.234	-0.0388	-0.254
	[0.576]	[0.397]	[0.216]	[0.229]	[0.528]	[0.368]	[0.168]	[0.216]
F-stats	5.551	7.045	6.574	7.059	5.090	7.033	5.666	7.033
$BR_m \cdot I(2000 \leq year \leq 2010)$	-0.344	-0.180	-0.0447	-0.117	-0.274	-0.135	0.106	-0.0829
	[0.555]	[0.403]	[0.231]	[0.241]	[0.490]	[0.365]	[0.196]	[0.221]
F-stats	10.59	13.14	13.23	13.17	10.05	13.27	10.01	13.27
Observations	12,659	12,653	12,628	12,634	948	945	945	945
B. Dependent variable: Average log hourly wages of earlier immigrants								
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	0.350	0.365	-0.0729	-0.0902	0.322	0.292	-0.0766	-0.124
	[0.287]	[0.289]	[0.271]	[0.268]	[0.271]	[0.280]	[0.282]	[0.247]
F-stats	4.892	5.804	5.197	5.793	3.923	5.268	4.413	5.268
$BR_m \cdot I(2000 \leq year \leq 2010)$	0.327	0.354	-0.0927	-0.0927	0.353	0.345	-0.144	-0.114
	[0.337]	[0.325]	[0.279]	[0.273]	[0.329]	[0.328]	[0.311]	[0.281]
F-stats	9.407	11.34	10.27	11.29	7.844	10.54	8.942	10.54
Observations	12,796	12,790	12,541	12,629	948	945	945	945
Year/Area fixed effects	√	√	√	√	√	√	√	√
Bartik		√	√	√		√	√	√
Demo. controls			√	Adj. $y_{m,t}$			√	Adj. $y_{m,t}$

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. Each row reports the coefficient of a regression of the average log hourly wage in a location and year on the share of new immigrants, $(IM_{m,t}/TOTEMP_{m,t})$, on the total workforce. In row 1 the share of new immigrants is instrumented with two separate dummies for the Phase 1 and Phase 2 of the reform, $BR_m \cdot I(2000 \leq year < 2004)$ and $BR_m \cdot I(2004 \leq year \leq 2010)$. In row 2, the new immigrant share is instrumented with only 1 interaction term for both Phase 1 and Phase 2, $BR_m \cdot I(2000 \leq year \leq 2014)$. F-statistics of the first stage is given below the standard errors of each regression. Regressions are weighted using the total workforce of cells.

Table 9: Effect of the Opening Immigration Policy on Hours Worked of Natives and Earlier Immigrants

Area level	Municipality			Commuting zone		
	(1)	(2)	(3)	(4)	(5)	(6)
A. Dependent variable: Log total hours worked of natives						
$BR_m \cdot I(2000 \leq year < 2004)$	-0.0257	-0.0266	-0.0265	-0.0315	-0.0351	-0.0290
	[0.0251]	[0.0244]	[0.0267]	[0.0266]	[0.0256]	[0.0273]
$BR_m \cdot I(2004 \leq year \leq 2010)$	-0.00559	-0.00682	-0.00944	-0.0236	-0.0285	-0.0339
	[0.0328]	[0.0305]	[0.0293]	[0.0278]	[0.0248]	[0.0314]
Observations	17,674	17,664	17,489	949	945	945
R-squared	0.972	0.972	0.973	0.988	0.988	0.988
B. Dependent variable: Log total hours worked of earlier immigrants						
$BR_m \cdot I(2000 \leq year < 2004)$	-0.00512	-0.00563	-0.000266	-0.0666	-0.0718	-0.0723
	[0.0309]	[0.0309]	[0.0390]	[0.0351]*	[0.0318]**	[0.0276]**
$BR_m \cdot I(2004 \leq year \leq 2010)$	0.00732	0.00674	0.0150	-0.0624	-0.0683	-0.0625
	[0.0595]	[0.0581]	[0.0589]	[0.0593]	[0.0557]	[0.0519]
Observations	12,801	12,795	12,546	948	945	945
R-squared	0.949	0.949	0.952	0.971	0.971	0.973
Year/Area fixed effects	√	√	√	√	√	√
Bartik		√	√		√	√
Demo. controls			√			√

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. BR_m is one for municipalities (commuting zones) in the border region. $I(2000 \leq year < 2004)$ and $I(2004 \leq year \leq 2010)$ are dummies for the differential opening in *Phase 1*, from 1999 to 2004, and *Phase 2*, from 2004 to 2010, respectively. Regressions are weighted using the total workforce of cells.

Table 10: Effect of New Immigrants on Hours Worked of Natives and Earlier Immigrants, 2SLS Estimates

Area level	Municipality			Commuting zone		
Instrument(s)	(1)	(2)	(3)	(4)	(5)	(6)
A. Dependent variable: Log total hours worked by natives						
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	-0.352	-0.417	-0.808	-0.732	-0.852	-1.348
	[1.201]	[1.017]	[1.001]	[0.948]	[0.794]	[1.292]
F-stats	5.551	7.909	7.263	5.090	7.491	6.185
$BR_m \cdot I(2000 \leq year \leq 2010)$	-0.898	-0.898	-1.337	-1.261	-1.334	-1.880
	[1.193]	[0.987]	[0.989]	[1.017]	[0.855]	[1.355]
F-stats	10.59	14.67	14.34	10.05	14.29	10.57
Observations	12,659	12,653	12,628	948	945	945
R-squared	0.976	0.976	0.976	0.988	0.988	0.988
B. Dependent variable: Log total hours worked by earlier immigrants						
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	0.297	0.251	0.528	-1.735	-1.829	-1.965
	[1.957]	[1.764]	[1.868]	[1.879]	[1.680]	[1.862]
F-stats	4.892	6.764	6.016	3.923	5.511	5.057
$BR_m \cdot I(2000 \leq year \leq 2010)$	0.134	0.100	0.403	-2.851	-2.787	-3.205
	[1.753]	[1.553]	[1.787]	[1.861]	[1.615]*	[1.687]*
F-stats	9.407	12.65	11.57	7.844	10.81	10.01
Observations	12,801	12,795	12,546	948	945	945
R-squared	0.949	0.949	0.952	0.968	0.968	0.969
Year/Area fixed effects	√	√	√	√	√	√
Bartik		√	√		√	√
Demo. controls			√			√

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. Each row reports the coefficient of a regression of log total hours worked by each group on the share of new immigrants, $(IM_{m,t}/TOTEMP_{m,t})$, on the total workforce. In row 1 in each panel the share of new immigrants is instrumented with two separate dummies for the Phase 1 and Phase 2 of the reform, $BR_m \cdot I(2000 \leq year < 2004)$ and $BR_m \cdot I(2004 \leq year \leq 2010)$. In row 2, the new immigrant share is instrumented with only 1 interaction term for both Phase 1 and Phase 2, $BR_m \cdot I(2000 \leq year \leq 2010)$. F-statistics of the first stage is given below the standard errors of each regression. Regressions are weighted using the group specific workforce of cells.

Table 11: Effect of New Immigrants on Wage Levels of Natives, 2SLS Estimates by Education Group

Area level	Municipality				Commuting zone			
Instrument(s)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Dependent variable: Average log hourly wage of highly educated								
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	0.602	0.666	0.913	0.464	0.448	0.491	0.516	0.211
	[0.274]**	[0.317]**	[0.329]**	[0.226]*	[0.278]	[0.325]	[0.326]	[0.259]
F-stats	12.69	12.29	10.70	12.66	6.602	7.218	4.707	7.218
$BR_m \cdot I(2000 \leq year \leq 2010)$	0.671	0.721	0.984	0.513	0.616	0.664	0.847	0.346
	[0.342]*	[0.381]*	[0.434]**	[0.291]*	[0.372]	[0.424]	[0.558]	[0.347]
F-stats	14.65	14.10	16.01	14.42	12.02	12.24	8.826	12.24
Observations	11,216	11,213	11,210	11,109	947	945	945	945
B. Dependent variable: Average log hourly wage of middle educated								
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	-0.591	-0.381	-0.299	-0.268	-0.544	-0.411	-0.124	-0.330
	[0.579]	[0.406]	[0.289]	[0.321]	[0.512]	[0.380]	[0.184]	[0.317]
F-stats	5.263	4.882	4.988	4.898	4.774	4.579	4.664	4.579
$BR_m \cdot I(2000 \leq year \leq 2010)$	-0.573	-0.324	-0.190	-0.145	-0.495	-0.326	0.0268	-0.0972
	[0.533]	[0.379]	[0.269]	[0.312]	[0.470]	[0.349]	[0.238]	[0.286]
F-stats	10.00	9.827	10.03	9.858	9.466	9.197	7.231	9.197
Observations	12,510	12,504	12,490	12,470	948	945	945	945
C. Dependent variable: Average log hourly wage of low educated								
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	-0.745	-0.725	-0.613	-0.397	-0.612	-0.607	-0.410	-0.429
	[0.632]	[0.555]	[0.513]	[0.522]	[0.544]	[0.486]	[0.390]	[0.464]
F-stats	3.896	4.724	4.162	4.778	4.280	5.401	5.281	5.401
$BR_m \cdot I(2000 \leq year \leq 2010)$	-0.818	-0.832	-0.673	-0.431	-0.560	-0.571	-0.271	-0.171
	[0.814]	[0.722]	[0.707]	[0.554]	[0.578]	[0.511]	[0.458]	[0.416]
F-stats	6.053	7.953	7.018	8.047	8.270	10.66	8.943	10.66
Observations	11,594	11,591	11,575	11,423	948	945	945	945
Year/Area fixed effects	√	√	√	√	√	√	√	√
Bartik		√	√	√		√	√	√
Demo. controls			√	Adj. $y_{m,t}$			√	Adj. $y_{m,t}$

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. Each row reports the coefficient of a regression of the average log hourly wage in an area and year on the share of new immigrants on the total workforce, $(IM_{m,t}/TOTEMP_{m,t})$. In row 1 in each panel the share of new immigrants is instrumented with two separate dummies for the Phase 1 and Phase 2 of the reform, $BR_m \cdot I(2000 \leq year < 2004)$ and $BR_m \cdot I(2000 \leq year \leq 2010)$. In row 2, the new immigrant share is instrumented with only 1 interaction term for both Phase 1 and Phase 2, $BR_m \cdot I(2000 \leq year \leq 2010)$. F-statistics of the first stage is given below the standard errors of each regression. Regressions are weighted using the total workforce of cells.

Table 12: Effect of New Immigrants on Hours Worked of Natives, 2SLS Estimates by Education Group

Area level	Municipality			Commuting zone		
Instrument(s)	(1)	(2)	(3)	(4)	(5)	(6)
A. Dependent variable: Log total hours worked by highly educated						
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	0.979	1.005	-1.152	0.155	0.207	-1.465
	[1.548]	[1.603]	[1.220]	[1.339]	[1.355]	[1.752]
F-stats	12.65	12.95	11.38	6.602	6.829	5.634
$BR_m \cdot I(2000 \leq year \leq 2010)$	0.529	0.546	-1.390	-0.462	-0.417	-2.682
	[1.836]	[1.896]	[1.399]	[2.068]	[2.113]	[1.932]
F-stats	14.61	15.01	17.07	12.02	12.47	10.22
Observations	11,239	11,236	11,233	947	945	945
R-squared	0.973	0.973	0.983	0.986	0.986	0.992
B. Dependent variable: Log total hours worked by middle educated						
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	-2.522	-2.914	-1.678	-2.427	-2.569	-1.344
	[0.990]**	[0.973]***	[1.073]	[0.928]**	[0.880]***	[1.505]
F-stats	5.263	5.442	5.442	4.774	4.877	4.842
$BR_m \cdot I(2000 \leq year \leq 2010)$	-2.659	-3.123	-1.878	-2.671	-2.850	-1.775
	[0.922]***	[0.902]***	[0.997]*	[1.062]**	[1.011]***	[1.541]
F-stats	10.00	10.90	10.88	9.466	9.682	7.249
Observations	12,513	12,507	12,493	948	945	945
R-squared	0.971	0.970	0.974	0.986	0.986	0.988
C. Dependent variable: Log total hours worked by low educated						
$BR_m \cdot I(2000 \leq year < 2004)$, $BR_m \cdot I(2004 \leq year \leq 2010)$	4.833	4.778	1.707	3.269	3.249	-0.287
	[4.219]	[3.841]	[2.272]	[3.378]	[3.079]	[2.199]
F-stats	3.896	4.744	4.180	4.280	5.338	5.217
$BR_m \cdot I(2000 \leq year \leq 2010)$	3.153	3.150	0.852	1.280	1.268	-1.952
	[3.570]	[3.487]	[2.175]	[2.447]	[2.381]	[2.016]
F-stats	6.053	7.909	6.999	8.270	10.50	8.673
Observations	11,594	11,591	11,575	948	945	945
R-squared	0.910	0.910	0.945	0.938	0.938	0.968
Year/Area fixed effects	√	√	√	√	√	√
Bartik		√	√		√	√
Demo. controls			√			√

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. Each row reports the coefficient of a regression of log total hours by education group in a location and year on the share of new immigrants, $(IM_{m,t}/TOTEMP_{m,t})$, on the total workforce. In row 1 in each panel the share of new immigrants is instrumented with two separate dummies for the Phase 1 and Phase 2 of the reform, $BR_m \cdot I(2000 \leq year < 2004)$ and $BR_m \cdot I(2004 \leq year \leq 2010)$. In row 2, the new immigrant share is instrumented with only 1 interaction term for both Phase 1 and Phase 2, $BR_m \cdot I(2000 \leq year \leq 2010)$. F-statistics of the first stage is given below the standard errors of each regression. Regressions are weighted using the group specific workforce of cells.

Table 13: Effect of New Immigrants on Distribution of Natives Across Management Levels Within Education Groups, 2SLS Estimates

Area level	Municipality				Commuting zone			
Dependent variable (Group share in 1998)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				A. Highly educated				
Share in high manag.	0.673	0.656	0.962	0.777	0.757	0.748	1.264	0.817
(0.222)	[0.265]**	[0.268]**	[0.331]***	[0.288]**	[0.345]**	[0.354]**	[0.549]**	[0.330]**
Share in middle manag.	-0.174	-0.196	-0.336	-0.290	-0.191	-0.220	-0.768	-0.313
(0.229)	[0.348]	[0.351]	[0.397]	[0.360]	[0.375]	[0.379]	[0.470]	[0.400]
Share in low manag.	0.242	0.253	0.210	0.00451	0.217	0.229	0.391	0.0606
(0.289)	[0.654]	[0.658]	[0.716]	[0.663]	[0.707]	[0.718]	[0.827]	[0.720]
Share in no manag.	-0.741	-0.713	-0.837	-0.491	-0.783	-0.757	-0.887	-0.564
(0.259)	[0.531]	[0.571]	[0.595]	[0.578]	[0.557]	[0.599]	[0.894]	[0.594]
Observations	11,202	11,199	11,196	11,064	947	945	945	945
R-squared	0.457	0.460	0.473	0.435	0.608	0.612	0.633	0.516
F-stats	14.54	14.94	17.00	15.28	12.02	12.47	10.22	12.47
				B. Middle educated				
Share in high manag.	-0.0852	-0.0581	-0.0164	-0.0223	-0.0890	-0.0516	0.00583	-0.0243
(0.033)	[0.130]	[0.116]	[0.114]	[0.149]	[0.148]	[0.139]	[0.181]	[0.170]
Share in middle manag.	0.0758	0.131	0.171	0.147	0.0914	0.137	0.320	0.158
(0.06 1)	[0.103]	[0.100]	[0.114]	[0.115]	[0.118]	[0.117]	[0.178]*	[0.123]
Share in low manag.	0.531	0.544	0.518	0.553	0.606	0.646	0.815	0.717
(0.250)	[0.494]	[0.452]	[0.476]	[0.453]	[0.477]	[0.441]	[0.485]	[0.463]
Share in no manag.	-0.521	-0.617	-0.672	-0.677	-0.609	-0.732	-1.140	-0.851
(0.656)	[0.549]	[0.508]	[0.530]	[0.485]	[0.569]	[0.529]	[0.631]*	[0.524]
Observations	12,468	12,462	12,449	12,414	948	945	945	945
R-squared	0.399	0.390	0.390	0.339	0.632	0.620	0.593	0.420
F-stats	10.00	10.91	10.88	10.96	9.466	9.682	7.249	9.682
				C. Low educated				
Share in high manag.	0.0387	0.0386	0.0597	0.177	0.0173	0.0170	0.0544	0.123
(0.006)	[0.0781]	[0.0771]	[0.0846]	[0.0985]*	[0.0734]	[0.0745]	[0.102]	[0.0920]
Share in middle manag.	0.199	0.199	0.209	0.288	0.136	0.136	0.170	0.219
(0.011)	[0.115]*	[0.107]*	[0.137]	[0.165]*	[0.0777]*	[0.0763]*	[0.0975]*	[0.118]*
Share in low manag.	0.297	0.297	0.267	0.0708	0.306	0.305	0.289	0.0889
(0.103)	[0.511]	[0.530]	[0.608]	[0.575]	[0.518]	[0.534]	[0.636]	[0.565]
Share in no manag.	-0.535	-0.535	-0.535	-0.535	-0.460	-0.458	-0.513	-0.431
(0.88)	[0.500]	[0.521]	[0.581]	[0.536]	[0.548]	[0.567]	[0.668]	[0.581]
Observations	11,498	11,495	11,480	11,276	948	945	945	945
R-squared	0.304	0.305	0.305	0.319	0.379	0.382	0.394	0.384
F-stats	6.090	7.974	7.069	8.000	8.270	10.50	8.673	10.50
Year/Area fixed effects	√	√	√	√	√	√	√	√
Bartik		√	√	√		√	√	√
Demo. controls			√	Adj. $y_{m,t}$			√	Adj. $y_{m,t}$

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. Each row reports the coefficient of a regression of the share of workers in a management level on the total workforce of an education group in an area and year on the share of new immigrants, $(IM_{m,t}/TOTEMP_{m,t})$, on the total workforce. The new immigrant share is instrumented with only 1 interaction term for both Phase 1 and Phase 2, $BR_m \cdot I(2000 \leq year \leq 2010)$. F-statistics of the first stage is the same for each management level among an education group. Regressions are weighted using the total workforce of cells.

Table 14: Effect of New Immigrants on Distribution of Natives Across Jobs Tasks Within Education Groups, 2SLS Estimates

Area level	Municipality				Commuting zone			
Dependent variable (Group share in 1998)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				A. Highly educated				
Share in complex tasks	-0.670	-0.678	-0.614	-0.718	-0.589	-0.589	-0.422	-0.656
(0.252)	[0.472]	[0.476]	[0.490]	[0.510]	[0.455]	[0.465]	[0.540]	[0.490]
Share in intermed. tasks	0.600	0.609	0.555	0.545	0.521	0.522	0.325	0.478
(0.725)	[0.430]	[0.435]	[0.458]	[0.486]	[0.406]	[0.417]	[0.494]	[0.459]
Share in simple tasks	0.0701	0.0685	0.0592	0.174	0.0685	0.0669	0.0968	0.177
(0.024)	[0.0923]	[0.0923]	[0.0932]	[0.0860]*	[0.0913]	[0.0915]	[0.110]	[0.0940]*
Observations	11,234	11,231	11,228	11,095	947	945	945	945
R-squared	0.341	0.341	0.344	0.266	0.464	0.464	0.462	0.261
F-stats	14.60	15.00	17.07	15.33	12.02	12.47	10.22	12.47
				B. Middle educated				
Share in complex tasks	-0.00699	0.00541	0.0218	0.0253	0.00273	0.0163	0.113	0.0563
(0.026)	[0.119]	[0.108]	[0.112]	[0.160]	[0.120]	[0.114]	[0.153]	[0.165]
Share in intermed. tasks	-1.219	-1.209	-1.366	-1.304	-1.183	-1.183	-1.688	-1.237
(0.852)	[0.462]**	[0.407]***	[0.391]***	[0.387]***	[0.407]***	[0.368]***	[0.437]***	[0.334]***
Share in simple tasks	1.226	1.204	1.345	1.279	1.181	1.167	1.575	1.181
(0.123)	[0.513]**	[0.445]**	[0.419]***	[0.441]***	[0.448]**	[0.395]***	[0.397]***	[0.388]***
Observations	12,508	12,502	12,488	12,453	948	945	945	945
R-squared	0.001	0.014	-0.038	-0.061	0.202	0.211	0.053	0.148
F-stats	10.02	10.92	10.90	10.98	9.466	9.682	7.249	9.682
				C. Low educated				
Share in complex tasks	0.00276	0.00281	0.00285	0.155	-0.00251	-0.00216	0.0215	0.122
(0.005)	[0.0782]	[0.0751]	[0.0827]	[0.0805]*	[0.0700]	[0.0649]	[0.0773]	[0.0761]
Share in intermed. tasks	0.105	0.105	0.112	-0.0549	0.515	0.516	0.605	0.317
(0.297)	[0.714]	[0.707]	[0.795]	[0.663]	[0.661]	[0.665]	[0.856]	[0.680]
Share in simple tasks	-0.108	-0.108	-0.115	-0.101	-0.513	-0.514	-0.626	-0.439
(0.699)	[0.740]	[0.730]	[0.813]	[0.693]	[0.662]	[0.667]	[0.866]	[0.704]
Observations	11,587	11,584	11,568	11,365	948	945	945	945
R-squared	0.388	0.389	0.393	0.379	0.382	0.382	0.387	0.361
F-stats	6.051	7.907	6.998	7.978	8.270	10.50	8.673	10.50
Year/Area fixed effects	√	√	√	√	√	√	√	√
Bartik		√	√	√		√	√	√
Demo. controls			√	Adj. $y_{m,t}$			√	Adj. $y_{m,t}$

Notes: ***, **, *, denote statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors, clustered by canton, are given in parentheses. Each row reports the coefficient of a regression of the share of workers in a task group on the total workforce of an education group in an area and year on the share of new immigrants, $(IM_{m,t}/TOTEMP_{m,t})$, on the total workforce. The new immigrant share is instrumented with only 1 interaction term for both Phase 1 and Phase 2, $BR_m \cdot I(2000 \leq year \leq 2010)$. F-statistics of the first stage is the same for each task group among an education group. Regressions are weighted using the total workforce of cells.