Cross-border Labor Outflows, Turnover, and Adjustments of Firms

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Abstract

This paper studies how firm adjustment to outflows of workers depends on the state of the local labor market and possibly the shock size. My difference-in-differences analysis leverages the gradual liberalization of the Swiss labor market for EU citizens, that generated an exogenous negative labor supply shock for Italian firms, with treatment intensity defined by their distance from the border. Using detailed social security data, I document a large outflow of workers and a sharp increase in turnover. In smaller, more constrained labor markets close to the border, surviving firms suffer immediate productivity losses and later adopt a cost-saving strategy by mitigating wage growth. In contrast, firms in wider markets further from the border, facing a weaker shock, do not experience a decline in productivity and are able to increase wages for incumbent workers. The negative effects are concentrated in high-skill intensive firms, consistent with higher turnover costs and the loss of firm-specific human capital in tighter labor markets. These outcomes can be rationalized within a standard competitive model in the presence of labor market imperfections.

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1 Introduction

The average quality of workers is a key determinant of productivity and wealth (Lucas, 1988) and local shocks to the labor supply may influence size and quality of the workforce. Outflows of workers represent a cost for firms when separating from an employee (past hiring and training costs, administrative termination costs, and marginal productivity) and firms need to make an optimal decision about the size of their employment. Replacing a worker who leaves also involves search, administrative and new training costs that crucially depend on the size and tightness of the local labor market in which firms operate, as large and thick markets facilitate the matching between workers and firms (Marshall, 1920). Outflows of workers represent a negative labor supply shock that might impact the productivity of firms, affect the career trajectory of incumbents, and alter the economic fabric of the local labor market.

The literature on migration typically studies the effects of worker outflows in the country of destination, while the impact in the sending one has been explored so far in the literature on brain drain with aggregate data. The effects of separation on firms have been mostly explored in the context of leave of single workers, whether due to deaths, parental, or sickness leave. Evidence on the effect on firms that lose workers on a large scale instead is still less understood. Recent research has begun to study the effect of large outflows exploiting the phenomenon of cross-border commuting, using granular administrative data to analyze the effects on firms in the country of origin. However, this emerging literature presents evidence for both negative consequences (Dodini et al. (2022)) and positive ones (Hafner and Hedtrich (2024)). Consequently, the broader effects on local economies, including which firms survive and how these shocks propagate geographically, remain unclear. Understanding these consequences is also a key policy concern, as governments might want to consider policies that strengthen or compensate for potential positive and negative effects of such shocks. It is therefore crucial to investigate the drivers and different mechanisms that determine whether a labor outflow ultimately benefits or harms the firms and communities left behind. This paper shows how negative and positive effects can coexist, with the outcome depending on the intensity of the outflows, on whether the size of the local labor market can absorb the shock, and on the skill requirements of firms.

I study the effect of a negative labor supply shock on Italian firms following a reform that led to the integration of the Swiss and Italian labor markets in the early 2000s. This reform is a unique quasi-experiment which led to complete removal of immigration restrictions between the EU and

Switzerland in 2000 creating powerful incentives for Italian workers to access the richer Swiss labor market, generating a large and sustained negative labor supply shock draining the labor force in municipalities close to the border for firms on the Italian side. I rely on four main different data sources: unique, detailed social security data on the universe of Cross Border Workers (CBWs) in Switzerland; social security data on the universe of Italian workers and firms, and balance sheet data of Italian firms, allowing me to look at changes in the workforce within each firm, and analyzing changes within small-medium sized firms once these workers leave the Italian labor market. Such granular data allows me to perform a very precise partial equilibrium analysis within relatively small segments of the labor market in Italy at the border with Switzerland, while nevertheless controlling for trends at the commuting-zone (CZ) level.

I implement a difference-in-differences strategy that leverages the timing of the labor market liberalization and a unique, geographically driven gradient in treatment intensity. The Swiss-Italian border, largely defined by the Alps, allows cross-border mobility through a limited number of crossing points, providing immediate access (0-15 minutes commuting time) to a small number of municipalities which I define as my treatment group. As distance increases, the labor market becomes three times larger in the 15-30 minute range of commuting time, which defines my moderately treated group. Finally, the larger labor market of municipalities more than 30 minutes away serves as the control group. This identification is further strengthened by a favorable fiscal regime for commuters, which reinforces the concentration of the labor outflow. Overall, municipalities in the control group fall within a maximum distance of 55 km (35 miles) to the Swiss border.

Based on Swiss data, I first document a large labor outflow of nearly 60,000 Italian CBWs. Although most of these outflows were composed of low-skilled labor, the emigration of high-skilled workers became more prominent over time. The geographic concentration of these commuters validates segmenting the Italian labor market into a treated (0-15 minutes) and a moderately treated (15-30 minutes) group. On the Italian side, this outflow is measured using worker *exits* from social security records. The validity of this proxy for emigration is corroborated by census data showing that local labor force participation rates remained stable, mitigating concerns that my measure captures transitions to non-employment. Validating the difference-in-differences design, I show that while there are no pre-reform differences, firms in the treated region lost an additional 8.3 percentage points of their workforce post-liberalization, an effect that diminishes to 2.6 percentage points in the moderately treated region. To ensure comparability across municipalities and firms of varying sizes, outflows and the corresponding firm exit margins are reported as percentages relative to 1998

baseline levels. The vacancies created by this outflow were then filled by internal mobility creating a "ripple effect" in which workers from the control regions moved toward the border. The overall size of the local labor force remained stable across all three groups throughout the sample period, which, in one of Italy's most productive areas, suggests a consistent firm density, a condition reassuring about a similar industrial fabric in the three groups.

I show that firms adjust on both the extensive and intensive margins, although the former is modest, with treated municipalities experiencing a small net decline in the number of firms of 2-2.5 percentage points. The primary adjustments occur within the surviving firms. Despite large worker outflows, firms in both the treated and moderately treated groups maintain stable employment by increasing hiring to match separations, albeit at the cost of much higher turnover, which is up to two-thirds higher in the treated region. While evidence suggests that firms increase capital intensity to substitute for labor, their wage and productivity outcomes diverge sharply. Firms in the treated region (0-15 minutes) suffer immediate and significant productivity losses, though these begin to rebound toward the end of the sample period. In contrast, those in the moderately treated region (15-30 minutes), operating in a thicker labor market, do not experience such a decline.

The dynamics of wage growth mirror this divergence and reveal the underlying mechanisms of firm adjustment. In highly treated regions (0–15 min), proximity to the border allows workers to fully exploit the substantial wage gap between Italian and Swiss firms. From the point of view of the Italian firm, throughout the sample period, matching a Swiss net salary would have required facing prohibitive labor costs —a fiscal hurdle that effectively prices local firms out of the competition for labor.[1] Faced with this constraint, firms in these thin markets adopt a survival strategy characterized by a shift toward a dual labor market structure: average wages fall because firms substitute departing staff with a "secondary" labor supply consisting of younger, less experienced workers, apprentices, or those on fixed-term contracts. While newly hired lower average wages, I find their intrinsic quality of these new hires—measured by AKM-style worker fixed effects—is not significantly different from their peers in control regions. At the same time, incumbent stayers in these firms do not experience positive wage spillovers.

The absence of positive wage growth for incumbents does not require a departure from standard

[1]Granting the Italian worker the same net salary of a Swiss one implies higher labor costs for the Italian firm by, on average, around 50%. This estimate reflects the gross-up required for an Italian firm to match Swiss net take-home pay, accounting for the significant tax wedge. Based on figures reported by INPS and the Swiss federal tax office, in Italy employer social security contributions (SSC) typically range between 24% and 30%; an additional 9–10% is paid by the employee. Total SSC for cross-border commuters in Switzerland are considerably lower, often totaling around 25-30%. This required wage premium, further amplified by the progressivity of the Italian personal income tax, remained high throughout the sample period, regardless of the exchange rate.

economic theory; it is consistent with a competitive framework when local labor market imperfections are taken into account. Specifically, I propose that the capacity of absorption of a local economy—shaped by its market thickness—might mediate the firm's response to supply shocks. While firms in thicker markets (15–30 min) navigate worker outflows through efficient matching, those in "thin" markets face significant efficiency losses and fiscal hurdles that preclude retention-based wage hikes. In these illiquid markets, productivity losses are reinforced by the high costs of turnover and the lack of workers with skills substitutable for those lost, a mechanism consistent with the skill-complementarity findings of Jäger et al. (2024). This pattern can also be linked to Italian institutional rigidities, such as employment protection legislation, which prioritize employment stability over wage flexibility. In contrast, in the moderately treated region, where the local labor market is twice as large and commuting costs to Switzerland are higher, these frictions are less binding. Firms in these thicker markets are better positioned to absorb the shock and successfully increase wages for their incumbent workers.

Aggregate adjustments mask significant heterogeneity in different industrial sectors. On the extensive margin, for instance, the net decline in firms is driven by different dynamics. In high-tech manufacturing, the negative net entry results from a significant drop in firm creation that is only partially offset by a reduction in firm exits, a finding consistent with Anelli et al. (2023). Conversely, traditional service firms experience higher churn; a large increase in firm exits outweighs a simultaneous rise in new entries, also leading to a net decline. On the intensive margin, the effects are similarly distinct. In the treated region (0-15 minutes), negative effects on productivity and wages are concentrated in high-tech manufacturing and knowledge-intensive services, consistent with these firms facing the highest adjustment costs due to their reliance on specific human capital. These negative effects dilute with distance; in the moderately treated region (15-30 minutes), the lower intensity of the outflow in a larger labor market prevents losses of productivity and allows firms in low-tech manufacturing and services to raise wages for incumbent workers.

To ensure the causal interpretation of these results, I conduct a comprehensive set of robustness tests. The main findings are robust to alternative regression specifications, including the exclusion of industries affected by concurrent trade agreements. The results are also not sensitive to the choice of the control group, as confirmed by a bootstrap exercise. A spatial placebo test, which redefines treatment and control groups at a greater distance from the border, reveals no significant effects, confirming that the shock is highly localized. Finally, the main conclusions hold when relaxing sample restrictions on firm size and using an alternative control group located much further away.

To summarize, this paper illustrates that the consequences of a large labor outflow are not uniform but critically depend on local market conditions. In tight labor markets immediately on the border, strong outflows lead to declines in productivity and compel firms to save on costs, mitigating wage growth for new hires. Just a short distance away, in thicker markets facing a more moderate shock, firms can instead absorb the pressure, avoiding productivity losses and raising wages for incumbent workers. The analysis thus provides evidence showing how positive and negative effects found in the literature can coexist and suggesting how market thickness and the intensity of the shock mediate firm-level adjustments to labor mobility.

The remainder of the paper proceeds as follows. Section 2 reviews the relevant literature on cross-border labor mobility and firm adjustments. Section 3 describes the institutional setting of the Italy-Switzerland border and the reform that liberalized labor movement. Section 4 details the data sources and the difference-in-differences identification strategy. Section 5 establishes the magnitude and geographic concentration of the labor supply shock. Sections 6 and 7 present the main results on firm adjustments along the extensive and intensive margins, respectively. Section 8 explores the heterogeneity of these effects across different industrial sectors. Section 9 provides a series of robustness checks, and Section 10 concludes.

2 Literature and Contributions

Outflows of workers are typically studied in the literature on brain drain[2] at the country level, documenting positive and negative effects on human capital accumulation.[3] Little is known, however, about how large outflows from the labor force operate through firms in the sending country's labor market. While a vast body of research focuses on the impact on firms and native workers in the country of destination (e.g., Dustmann and Glitz, 2015; Dustmann et al., 2017), this paper investigates these effects in the country of origin.[4]

This paper contributes to three main strands of literature. First, it provides a rich setting to study how firms in sending countries are affected by cross-border labor outflows considering the local

[2]See Docquier and Rapoport (2012) for a review.

[3]Theoretical work by Wong and Yip (1999) and Haque and Kim (1995) shows that negative consequences for productivity and growth occur when the stock of human capital is exogenous, or when new human capital ends up abroad. Kremer (1993) shows this negative effect can also act through occupational shortages.

[4]Most studies have focused on an increase in local labor supply; see Grossman, 1982; Card, 1990; Altonji and Card, 1991; Goldin, 1994; Borjas et al., 1997, 1996; Card, 2001; Angrist and Kugler, 2003; Borjas, 1999, 2003; Manacorda et al., 2012; Ottaviano and Peri, 2012; Borjas, 2017; Monras, 2019. Other works (e.g., Clemens et al., 2018; Andersson et al., 2020; Fernandez-Sanchez, 2020; Bütikofer et al., 2024) have focused on historical mass migration but have not been able to address adjustments at the firm level.

labor market and the size of the shock. The first paper to to study the effect of outflows on firms is Giesing and Laurentsyeva (2017), which finds in a cross-country study that skilled emigration after the EU enlargement led to negative short-term effects on firm productivity in Eastern Europe. More recent studies using granular data, however, have produced conflicting results. For instance, Dodini et al. (2022) exploit an oil boom in Norway that increased wages in all sectors and attracted Swedish workers. They find negative effects on Swedish firms and, crucially, that non-commuting workers moved *away* from the border. This internal migration pattern contrasts sharply with my findings. As posed by Manning and Petrongolo (2017), workers move where they expect less competition. In the shrinking Swedish border economy described in their paper, this meant relocating to larger economic hubs. In my Italian setting, however, because firms at the border remained resilient, workers from the interior, rather than competing for jobs in the area of Milan for example, found it more advantageous to move *closer* to the border to fill vacancies. In contrast to these negative findings, Hafner and Hedtrich (2024) finds positive effects on the France-Switzerland border, while a cost-saving response similar to mine is documented by Neuber-Pohl et al. (2023) on the Swiss-German border, although their analysis lacks evidence on firm performance. Finally Illing (2025), analyzing the outflows of Czech workers to Germany, shows that the Czech border region faced labor shortages, while local labor markets in Germany were able to fully absorb the migrant inflow.

This paper suggests how these divergent outcomes might depend on the intensity of the outflow and the size and state of the local labor market. The unique geography of the Italian border—with the Alps concentrating mobility through a limited number of crossing points—creates a natural experiment where a smaller, more constrained labor market (0-15 minutes) coexists next to a wider one (15-30 minutes). This feature is supported by official statistics from the Swiss Federal Statistical Office, which highlight the comparatively limited access points from the Italian side versus the much broader access from France.[5] In the most constrained market, I find results consistent with Dodini et al. (2022), whereas in the wider market, the effects are more in line with Hafner and Hedtrich (2024), as firms can more easily replace workers and even raise wages for incumbents.[6] Notably, the positive effects in my moderately treated group occur despite the outflows being even larger than the ones observed in the French labor market, where additional outflows represent four percent

[5] See Federal Statistical Office.

[6] While the mapping between these two contributions and mine is not exact across all margins — both papers, for example, report an increase in wages — it is worth highlighting a few points. First Hafner and Hedtrich (2024) reports overall labor market effects, my results are mostly tied to the internal adjustments of surviving firms. Second, once commuters are excluded from the Swedish and French samples, their reported 1% wage growth for stayers is consistent with the wage stability I observe for Italian incumbents.

of the workforce, compared to the additional eight percent I find in this region.[7] The negative effects on firm creation in high-skill sectors are also found by Anelli et al. (2023).[8] While this paper focuses on outflows from worker choice, a related literature finds similar firm-level pressures from shocks caused by the reintroduction of immigration restrictions.[9] This analysis also complements the evidence shown by Beerli et al. (2021) on the Swiss side, finding that the influx of predominantly high-skilled Italian workers led to positive outcomes in Switzerland, increasing the wages of high-skilled natives. They show this was driven by firms in high-tech sectors overcoming skill shortages, which boosted their productivity and innovation, creating new managerial opportunities for native Swiss workers.[10]

Second, the paper contributes to the literature on worker substitutability following idiosyncratic separations like family leave (Ginja et al., 2023; Corekcioglu et al., 2025), sickness (Schmutte and Skira, 2023), or worker deaths (Jäger et al., 2024), which typically find low replacement rates. In response to a large-scale, predictable outflow, I find a much higher replacement rate of nearly one-to-one over the whole sample period, closer to the cumulative effect over three years found by Jäger et al. (2024) for worker deaths. My findings on wage adjustments also align with their work. The fact that incumbent workers in the most affected firms do not see significantly higher wage growth, despite the outflow, is consistent with the theory that frictions in smaller labor markets impose significant costs not only on firms but also on their remaining employees. Finally, the paper provides new quasi-experimental evidence for the theories of local labor markets developed by Manning and Petrongolo (2017). Consistent with their model, I document the presence of ripple effects, as vacancies at the border are filled by workers moving from further inland and show that these effects dissolve after approximately 30 minutes of commuting.

3 Institutional Setting

This section describes the institutional framework governing mobility between the Italian and Swiss labor markets. It first outlines the strong economic incentives for Italian workers to seek employment in Switzerland and the significant restrictions that limited mobility prior to 2000. It then details the Agreement on the Free Movement of Persons, the policy reform that removed these

[7] When the pool of workers is large, a firm can more easily replace the skills lost and retain workers by increasing their wages, without incurring productivity losses. See also Manning, 2006; Blatter et al., 2012.

[8] See also Prato (2025).

[9] See East et al. (2022); East and Velasquez (2018)

[10] Other related work on commuting between Italy and Switzerland has analyzed the effects of the Schengen Agreement implementation (Parenti and Tealdi, 2019) and exchange rate fluctuations (Bello, 2020).

barriers, and serves as the quasi-experimental shock for this paper's analysis.

The Swiss labor market is highly attractive for Italian workers, primarily due to large wage and income differentials. While both are advanced economies, Switzerland's per-capita wealth has historically been much greater, creating a substantial wage premium.[11] The average gross wage in the bordering Swiss cantons (approx. €4,200/month) is more than double that in the Italian bordering provinces (approx. €1,800/month), a difference even more pronounced for high-skilled occupations.[12] Further, the unemployment rate in Switzerland has historically been lower than in Italy. The two border labor markets also differ starkly in size. The Italian bordering provinces represent one of the country's most productive and densely populated areas, with a labor force of around 1.5 million people. In contrast, the bordering Swiss cantons had a labor force of about 350,000 people in 1998. This asymmetry highlights the potential for a large supply shock, as the relatively small Swiss market became a highly attractive destination for workers from the much larger adjacent Italian market. The geography of the border further concentrates this shock along the border with the canton of Ticino.

Significant institutional barriers severely limited this mobility prior to the reform. Until 1999, CBWs were subject to yearly quotas. A CBW permit was valid for only one year, tied the worker to a specific job, and required a daily return to Italy. Crucially, Swiss employers faced a "priority requirement", obliging them to search for a suitable resident worker for six months before they could hire a foreigner. Consequently, Italians working in Switzerland before the reform were mostly seasonal, low-skilled workers. The 1999 Agreement on the Free Movement of Persons (AFMP) between Switzerland and the EU fundamentally altered this landscape. The agreement, announced in 1998 and ratified in 1999, passed a Swiss referendum in 2000, and restrictions were gradually removed starting in 2002. The labor market was fully liberalized for CBWs in 2004 with the abolition of the priority requirement, while restrictions for resident immigrants were fully lifted in 2007. The timing and content of the reform were driven by high-level negotiations between Switzerland and the EU, making it unlikely that local economic conditions in the Italian border region played a role

[11] According to the IMF, in 1998 Italy was the 6th country by GDP while Switzerland ranked at the 17th place. In terms of GDP per capita, however, Switzerland was the second-richest country in the world, while Italy was ranked 20th.

[12] Wages are in real terms and gross of personal income taxes, which are lower in Switzerland, suggesting the net wage gap is even larger. For high-skill occupations, the average Swiss monthly wage (approx. €6,000) is nearly triple the Italian equivalent (€2,200). These large differentials are not offset by commuting costs, which are modest given the short distances involved, and similar to a counterfactual commuting in Italy. From the perspective of the firm, competition for labor is further hampered by the higher requirement on social security contributions paid by Italian firms compared to their Swiss counterparts.

in the process (Beerli et al., 2021).[13]

4 Data and Identification

This section describes the data and the empirical strategy used to estimate the causal effect of labor market integration on Italian companies. First, I detail the various administrative and survey datasets from both Switzerland and Italy. Second, I outline the difference-in-differences (DiD) identification strategy, which leverages the timing of the reform and the geographic variation in firms' proximity to the Swiss border.

4.1 Data

This analysis links four sources of administrative data covering the universe of CBWs in Switzerland, the universe of firms and workers in Italy, firm balance sheets, and supplemented with census and survey data. To define treatment intensity, I construct a new dataset measuring the driving time from each Italian municipality to the nearest Swiss border crossing.

Swiss Data. To measure the labor outflow, I use data from the Swiss Central Migration Information System (ZEMIS), which contains the universe of employment spells for foreign workers in Switzerland. This allows me to observe the Italian municipality of residence for CBWs. These data are essential for documenting the magnitude and geographic concentration of the shock, as detailed in C.

Italian Matched Employer-Employee Data. The core of the analysis uses administrative data from the Italian National Institute of Social Security (INPS), which provides the universe of matched employer-employee records for the private sector from 1983. The worker data contain complete employment histories, including gross earnings, contract type, qualification (manager, white-collar, blue-collar, or apprentice), and part-time status; detailed occupation data and educational level are not available for my sample period. The primary measure of employment is the number of weeks paid, from which I construct weekly wages. A key set of demographic variables is available for each worker, including year and month of birth, gender, nationality, and municipality of residence, as well as dates of retirement or death. The firm data contain information on the universe of private sector establishments, including location, sector, entry, and exit dates. The combined datasets cover

[13] Other bilateral agreements signed at the same time regulated reductions in trade costs. A deeper discussion of the reform process is available in B.1.

approximately 80% of total Italian employment, excluding self-employed workers, public sector employees, and agricultural workers.

Balance Sheet Data. I complement the INPS data with firm balance sheets from *Cerved*, which provides information on value added, total assets, revenues, and other financial variables for the universe of incorporated firms from 1996 to 2016. These firms, which represent about 20% of my sample, account for 70% of Italian manufacturing value added (Calligaris et al., 2018). As these data are available at the firm level, I restrict the analysis to single-establishment firms when using them. For additional evidence, I also use census data, and the Bank of Italy's survey of firms (INVIND).[14]

4.2 Sample Selection

The analytical sample is constructed from the universe of Italian private-sector firms and workers by applying several selection criteria. The initial sample includes all workers aged 16 to 65 with at least one employment spell between 1994 and 2015. I construct full-time equivalent (FTE) employment measures and then restrict the sample to single-establishment firms with between 3 and 250 FTE employees. This restriction, which covers firms representing approximately 42% of total *Italian* employment, avoids issues related to locating multi-plant firms and the mechanical negative correlation between initial size and subsequent growth common in very small firms.[15]

To focus on the relevant local labor market, I keep only firms located within a 75-minute driving time to the Swiss border and exclude firms located in the city of Milan, a major economic hub with unique labor market dynamics that make it an outlier. I further exclude firms in the public and agricultural sectors and international organizations. All wage data are expressed in 2015 prices and winsorized at the 0.5 and 99.5 percentiles. The analysis of the extensive margin (firm entry and exit) uses this full sample. For the analysis of the intensive margin, I restrict the sample to surviving firms (active by 1998) to eliminate bias from self-selection of firm entry. The final sample represents 6.5% of all Italian firms and 8.7% of total employment, with manufacturing firms accounting for 60% of the sample (see Appendix Table 27 for a detailed comparison).

[14] A detailed description of the Cerved and INVIND data is reported in B.2.

[15] A detailed discussion of the firm size restriction is in Mata (1994) and Ruffner and Siegenthaler (2017). The main results are robust to using a 4% random sample of firms of all sizes, as shown in the robustness section.

4.3 Identification Strategy

To estimate the causal effect of the labor supply shock, I implement a difference-in-differences (DiD) strategy. The research design leverages two sources of variation: the plausibly exogenous timing of the labor market liberalization and the geographic variation in treatment intensity, given by the unique feature of the Italian border.

4.3.1 Timing of the Reform and Assignment to Treatment

The timing of the DiD follows the phased implementation of the AFMP. As summarized in Table 1, I define three periods: a pre-reform period (1994-1998); a transition period (1999-2003), which captures anticipation effects and the initial easing of restrictions; and a free access period (2004 onward). I divide firms into three groups based on the driving time from their municipality to the nearest Swiss border crossing as shown in Figure 1: a *treated* group (0-15 minutes), a *moderately treated* group (15-30 minutes), and a *control* group (more than 30 minutes away).[16] This identification strategy is motivated by the unique geography of the Italian border, which creates a natural experiment where a smaller, more constrained labor market coexists next to a wider one. This feature is supported by official statistics from the Swiss Federal Statistical Office, which highlight the comparatively limited access points from the Italian side versus the much broader access from France. Italian firms closer to the border were thus more exposed to losing workers. The evidence on worker outflows presented in Section 5.3 provides strong empirical support for this distance-based definition of treatment intensity.

Table 1: Timeline of Labor Market Integration

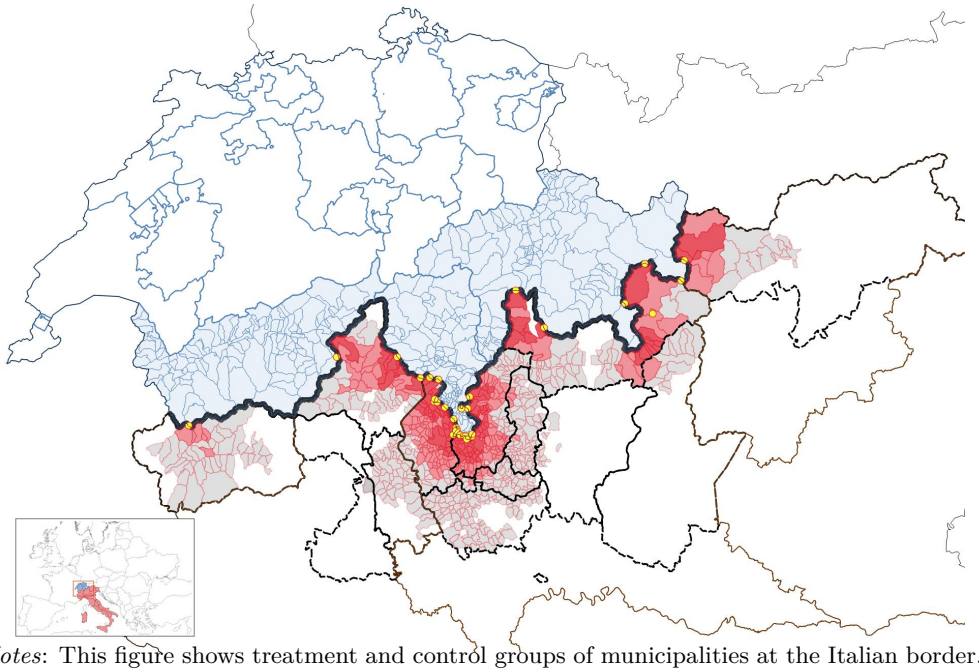
Year	1994	1998	**1999**	2002	2003	**2004**	2007	2008	2015
Phase	**Pre-Reform**		**Transition**			**Free Access**			
Effect	Full Restrictions		Less Restrictions			Free CBWs		No restrictions	

4.3.2 Empirical Specifications

I present two main specifications: a standard difference-in-differences (DiD) model to estimate the average effects of the reform, and an event study framework to analyze the effects in each year. The effect of labor market integration is estimated by regressing an outcome $y_{j,t}$ for a unit of observation j – either a municipality, a firm, or an employee – at time t on treatment dummies.

[16] Considering commuting by train does not change the allocation of municipalities within these groups. Using an alternative definition of firm location based on the municipality of residence of its median worker yields similar results.

Figure 1: Map of Treatment and Control groups



Notes: This figure shows treatment and control groups of municipalities at the Italian border. Border crossings are yellow dots. Province NUTS III border are delimited by a dashed black line. Treated firms are in a commuting bin of 0-15 minutes to the closest border crossing (dark red). Moderately Treated firms are in a commuting bin of 15-30 minutes to the closest border crossing (light red). Control firms are in a commuting bin of more than 30 minutes to the closest border crossing (light gray).

The treatment dummies are $T_j = I(d_j < 15)$ for treated units and $MT_j = I(15 < d_j < 30)$ for moderately treated ones, where d_j is the driving time to the border from municipality j. These are interacted with period indicators: $I(\text{Transition}_t)$ for the years 1999–2003, and $I(\text{Free}_t)$ for the years 2004 onward.

$$\begin{aligned} y_{j,t} =& \beta_0^{Tr}[I(d_j < 15) \times I(\text{Transition}_t)] + \delta_0^{Tr}[I(15 < d_j < 30) \times I(\text{Transition}_t)] \\ &+ \beta_1^{F}[I(d_j < 15) \times I(\text{Free}_t))] + \delta_1^{F}[I(15 < d_j < 30) \times I(\text{Free}_t)] \\ &+ \alpha_j + \alpha_t + \gamma X'_{j,t} + \epsilon_{j,t} \end{aligned} \tag{1}$$

All specifications includes year fixed effects (α_t), firm fixed effects (α_j) when the unit of observation is the firm, and also worker fixed effects for wage regressions at the worker level. The vector $X'_{j,t}$ includes time-varying controls, such as a Bartik-style control for industry composition shifts[17] and granular CZ (i.e. province or NUTS III) time trends. The coefficients of interest are β_0^{Tr}, δ_0^{Tr}, β_1^F, and δ_1^F. The first two capture the short-run effects of the labor market integration, while the last two capture the long-run effects on the treated and moderately treated firms, respectively.[18]

For graphical representation and to show absence of pre-trends, I generalize this model into an event study framework. I regress the outcome $y_{j,t}$ on a full set of year dummies interacted with the treatment group indicators:

$$\begin{aligned} y_{j,t} = \alpha_j + \alpha_t + & \sum_{t=1994}^{2018} \beta_{1,t} I(year = t) \times I(d_j < 15) \\ & + \sum_{t=1994}^{2018} \delta_{1,t} I(year = t) \times I(15 < d_j < 30) + \gamma X'_{j,t} + \epsilon_{j,t} \end{aligned} \tag{2}$$

In the event study, the coefficients $\beta_{1,t}$ and $\delta_{1,t}$ capture the year-by-year effect for each treatment group relative to the baseline year of 1998. Standard errors are clustered at the local labor market, CZ level. The model allows for different average outcomes across the three groups, which are absorbed by the firm fixed effects. The key identifying assumption is that, conditional on controls, outcomes would have evolved on parallel trends in the absence of the reform. All identifying variation

[17] The basic intuition is to control for regional changes in employment or wages, that are due to national level changes in industries that are strongly represented in a particular region. The methodology follows the one reported by Beerli et al. (2021) in their online Appendix Section B.3.

[18] The model assumes common time effects across all three groups; running the same model on pairs of groups does not change the results.

comes from comparing firms within the same province that are assigned to different treatment groups based on the municipality where they are located.

4.3.3 Summary Statistics and Identification Assumptions

Table 9 in the appendix presents summary statistics for the pre-reform period (1998), comparing firms across the three groups. While a difference-in-differences design relies on the parallel trends assumption rather than on baseline balance, examining pre-existing characteristics provides important context. The sample consists of 55,524 firms active in 1998, with 2,964 in the treated group, 9,487 in the moderately treated group, and 42,710 in the control group. Firms in the treated region (0–15 minutes) exhibit some statistically significant differences from the control group. They are, on average, slightly smaller (1.8 fewer FTE employees), pay lower weekly wages (by approximately €63), and have slightly higher rates of worker disappearing (exits) in the pre-period. These differences, which easily achieve statistical significance due to the large sample size, are however small in economic terms; the standardized differences are all around or below a 0.2 threshold, suggesting the groups are broadly comparable. Any remaining time-invariant difference is absorbed by the inclusion of firm fixed effects in the regression models. A detailed discussion of the summary statistics is provided in A.

The key identifying assumption for the DiD models is that, conditional on controls, outcomes in the treated and control regions would have followed parallel trends in the absence of the reform. The event study results presented in Section 5 provide strong support for this assumption. Several other concerns could threaten the validity of the identification strategy. First, other regional or industry-specific shocks, such as the ratification of the MRA trade agreement or exchange rate fluctuations, could have confounding effects. Second, since treatment is defined by distance to the border, unobserved firm or worker characteristics non-linearly correlated over time with location could bias the results. Third, the internal mobility of workers from the control to the treated regions could, in principle, violate the SUTVA assumption. A final consideration is that the higher earnings of cross-border commuters could generate positive demand-side spillovers for local non-tradable industries; while I cannot isolate this channel, I explore its potential influence in the heterogeneity analysis in Section 8. I address the other threats to identification in a series of robustness checks in Section 9.

5 Exits and Mobility

This section establishes the negative labor supply shock at the core of this paper's analysis. First, relying on Swiss administrative data, I document the large and sustained outflow of Italian workers following the labor market liberalization. I show this outflow was highly concentrated in Italian municipalities close to the border, which provides empirical support for the distance-based identification strategy. Second, I demonstrate that this pattern is mirrored in the Italian social security data, where worker *exits* from firms increase sharply in the border region. Finally, I document the resulting ripple effects, as vacancies created by the outflow are filled by workers moving from further inland, and I show with census data that employment and participation rates in these regions remained stable over the sample period.

5.1 The Outflow of Italian Workers to Switzerland

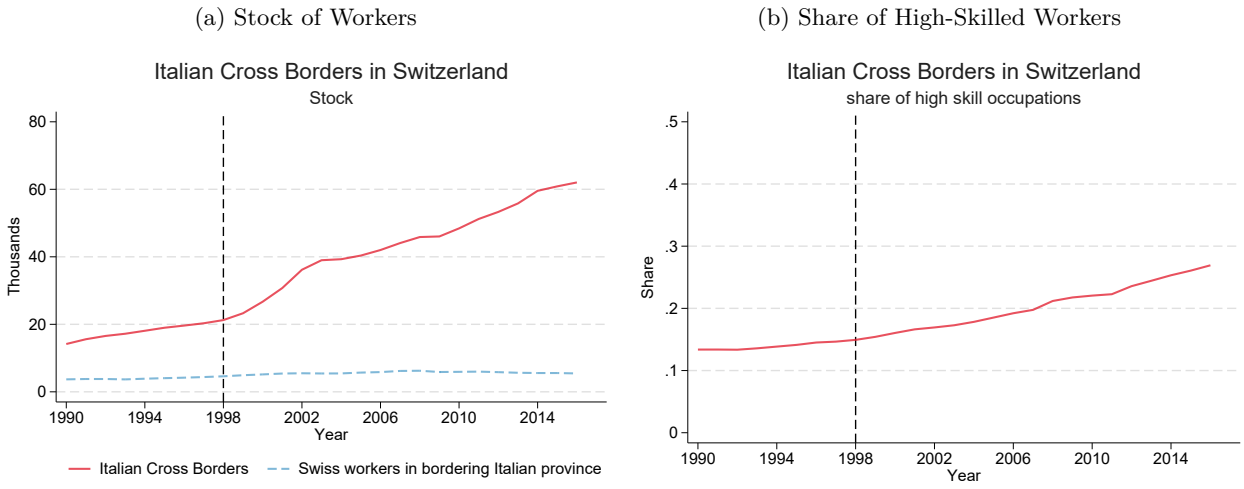
The 1999 AFMP dramatically increased the attractiveness of the Swiss labor market for Italian workers, primarily due to large wage differentials, a shared language in the border Swiss cantons, and geographical proximity. ZEMIS data confirm a massive response to the policy. As shown in Figure 2, the stock of Italian CBWs, which was stable at around 20,000 before the reform, quadrupled to nearly 80,000 by 2015.[19] While the outflow of CBWs remained predominantly low-skilled, the number of high-skilled workers became more salient (rising from approximately 13% to almost 30% – Figure 2, Panel b).

This large outflow of labor was highly concentrated geographically, motivating the distance-based identification strategy. Using Swiss data on the Italian municipality of residence for CBWs, I show that proximity to the border is the key determinant of exposure to the shock. Nearly 80% of these commuters reside within a 30-minute drive of the border, a concentration reinforced by a favorable fiscal regime that exempts those living within 20km from paying Italian income taxes.[20] The geographic conformation provides then a clean source of variation to define treatment intensity based on commuting time from the border. Figure 3 illustrates this pattern by plotting the share of a municipality's 1991 population working as CBWs against its driving time to the nearest Swiss border

[19] The yearly inflow of CBWs increased from approximately 4,000 to 15,000 workers per year. In contrast, the number of Swiss citizens working in the Italian border regions is small (4,000–5,000 per year) and declined over the same period.

[20] As they commute regularly, CBWs live close to the border by definition. Approximately 90% of CBWs reside in municipalities within 20km of air distance, an area that features both my treatment groups and around 50% of my control municipalities. The share of CBWs drops sharply beyond the 30-minute commuting threshold.

Figure 2: The Outflow of Italian CBWs to Switzerland, 1990–2015



Notes: The figure plots the evolution of the Italian CBWs population in Switzerland. Panel (a) shows the total stock of Italian CBWs (solid line) from 1990 to 2015. For comparison, the stock of Swiss workers in the Italian border region is shown (dashed line). Panel (b) shows the share of all Italian CBWs employed in a high-skilled occupation (ISCO-88 codes 1, 2, and 3). Source: Author's calculations from Swiss ZEMIS data.

crossing for several years. The figure reveals a sharp gradient in the intensity of the labor outflow that aligns with the defined treatment and control regions. In the treated region (0–15 minutes), the share of CBWs was already the highest before the reform and increased dramatically thereafter, reaching between 3% and 15% by 2014. In the moderately treated region (15–30 minutes), this share also grew, but from a lower base and at a more modest rate, reaching a maximum of almost 5% of the population. Critically, beyond the 30-minute threshold that defines the control region, the share of CBWs is negligible and remains close to zero throughout the entire period.[21]

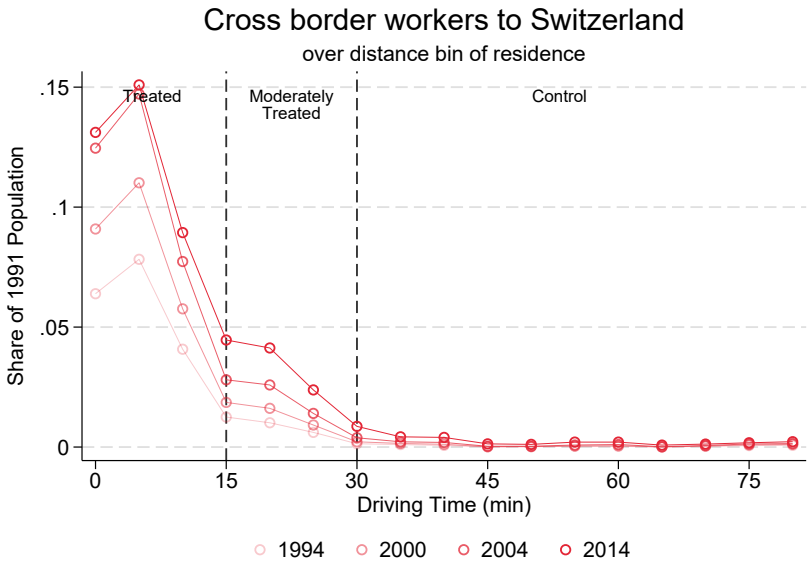
The Italian labor outflow included both cross-border workers (CBWs), who maintained their Italian residence, and Resident Immigrants (RIs), who relocated. Table 2 provides a detailed breakdown with absolute numbers, showing that while RIs follow a similar geographic concentration pattern as CBWs in relative terms, they represent a much smaller component of the total outflow.[22] As CBWs constitute the vast majority of the shock, they are the primary channel for the local labor supply shock I study. Therefore, while the analysis accounts for the total outflow, I will refer to it in terms of the cross-border channel for brevity. Finally, the same table displays a similar density

[21] These population-based shares likely understate the shock's true impact on the local labor market. As worker-level residence information in the Italian records is only consistently available for later years, using the 1991 population as a fixed denominator is a conservative approach. For reference, measuring the share of CBWs relative to the 2017 local labor force reveals peaks that can reach 60% in municipalities in the treated region and around 10% in the moderately treated one.

[22] Data on resident immigrants are taken from Anelli et al. (2023) where the authors provided me the aggregate numbers. A more extensive discussion of resident immigrants, who are more geographically dispersed, is in C.

of firms across the three groups.

Figure 3: Geographic Concentration of CBWs by Commuting Time to Switzerland



Notes: The figure plots the number of CBWs as a share of the 1991 municipal population. The horizontal axis groups municipalities into five-minute bins based on driving time to the nearest Swiss border crossing. Each line represents a different year, showing the growth and concentration of the expat population over time. The vertical dashed lines indicate the 15-minute and 30-minute thresholds used to define the treated, moderately treated, and control regions. Source: Author's calculations from Swiss ZEMIS and Italian Census data.

Table 2: Descriptives of Treatment and Control Groups

		Treated		Mod Treated		Control	
	Year	CBW	RI	CBW	RI	CBW	RI
Outflow	1994	8,064	378	6,308	244	2,317	599
	2015	16,746	125	24,391	299	14,645	843
Employment	1991	84,814		221,482		1,181,278	
Number of Firms	1998	2,964		9,487		42,710	
Number of municipalities		52		122		447	

Source: Author's calcuation on Zemis, INPS, and Census data.

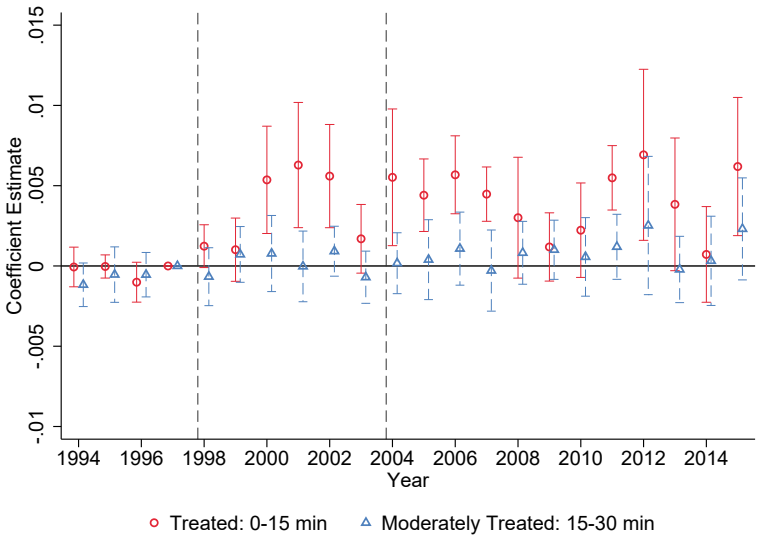
5.2 Worker Exits from Italian Firms Confirm the Shock

To measure the impact of the labor outflow on Italian firms, I analyze worker exits from the Italian social security data. I define as *exit* an employee who permanently disappears from the universe of private-sector employment records without a subsequent record of retirement, death, or a move to the public sector or self-employment. This serves as a consistent and conservative proxy for emigration, as it is not confounded by internal migration within Italy and excludes temporary

or seasonal migrants who later return. The key identifying assumption is that the rate of workers leaving the labor force for other reasons follows a common trend across regions, an assumption supported by census data showing a stable participation rate around 54% (see Figure 7a).[23]

The event study results confirm that the timing and intensity of worker exits from Italian firms mirror the outflow of CBWs to Switzerland. Figure 4, which plots the yearly flow of exits as a share of 1998 employment, validates the parallel trends assumption, as there are no significant pre-reform differences between the groups. Following the reform's announcement, exit flows from firms in the treated region (0–15 minutes) increase sharply, with jumps that correspond to the key phases of the liberalization around 2000, and 2004. Figure 5 shows the cumulative impact of these flows. By the end of the sample period, firms in the most treated region had lost around 12 percentage points more of their 1998 workforce than firms in the control group, an effect almost twice as large as the baseline exit rate. The effect is smaller but still significant for moderately treated firms (15–30 minutes), which lost approximately 3 percentage points more of their workforce.

Figure 4: The Effect of Labor Market Integration on Yearly Worker Exit Flows

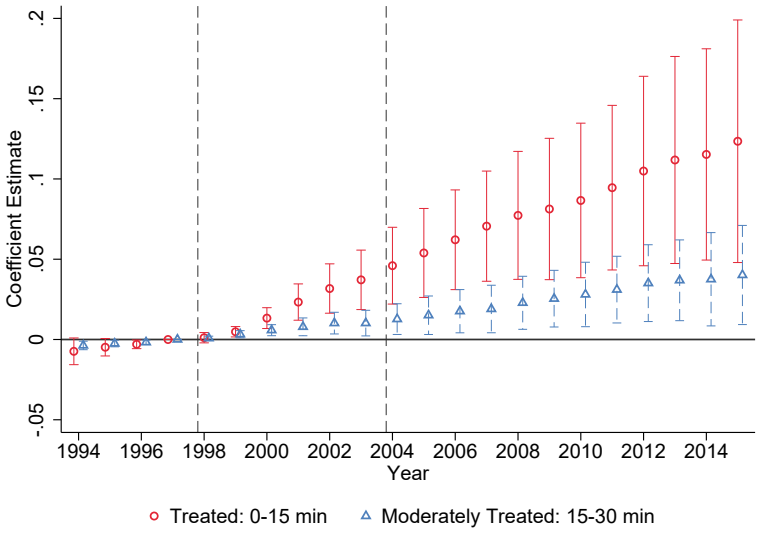


Notes: The figure plots coefficients and 95% confidence intervals from the event study specification in Equation (2). The dependent variable is the yearly flow of full-time equivalent (FTE) worker exits, scaled by the firm's total employment in 1998. The estimates compare firms in the treated (0–15 min, circles) and moderately treated (15–30 min, triangles) regions to the control one. All regressions include firm and year fixed effects, local labor market (NUTS-III) time trends, and a Bartik control. Standard errors clustered at the local labor market level. Source: INPS data.

The estimates in Table 3 quantify the average effect over the full post-reform period, showing an

[23]My definition of *exit* is conservative for several reasons, most importantly because it cannot account for the loss of potential workers, such as new graduates who seek their first employment directly in Switzerland after the reform. A deeper discussion on the construction of the exit variable is in B.2.

Figure 5: The Cumulative Effect of Labor Market Integration on Worker Exits



Notes: The figure plots coefficients and 95% confidence intervals from the event study specification in Equation (2). The dependent variable is the cumulative stock of full-time equivalent (FTE) worker exits, scaled by the firm's total employment in 1998. The estimates compare firms in the treated (0–15 min, circles) and moderately treated (15–30 min, triangles) regions to the control one. All regressions include firm and year fixed effects, local labor market (NUTS-III) time trends, and a Bartik control. Standard errors clustered at the local labor market level. Source: INPS data.

8.3 percentage point increase in total exits for the treated firms and a 2.6 percentage point one for moderately treated. This outflow was broad-based, affecting workers across all four quartiles, and becomes smaller in the moderately treated group which also does not display a higher number of exits from the top quartile.[24] While I lack more reliable proxies for skills, such as detailed occupation or educational level, these findings have an important implication for firm adjustment. Even in a scenario in which the outflow of high-skilled workers was not significantly different from the control group, which would anyway be in contrast with the evidence from Swiss data, their replacement in the smaller, more constrained labor market at the border is disproportionately costly. Higher turnover of skilled labor imposes significant costs on firms in these areas, not just because valuable workers leave, but because the local pool of substitutable workers becomes inherently smaller.

5.3 Internal Mobility and Ripple Effects

The large outflow of workers to Switzerland created vacancies in the Italian border region, which were subsequently filled by workers from further inland. This internal reshuffling of labor is a key

[24]This pattern that is robust when restricting the sample to incorporated firms only. Also, studying exits by worker qualification reveals larger coefficients in the treatment group, while statistical significance is detected for blue-collar workers and apprentices.

Table 3: The Effect of Labor Market Integration on Worker Exits by Wage Quartile

	(1) Exits	(2) Exits Bottom Quartile	(3) Exits Lower Mid Quartile	(4) Exits Upper Mid Quartile	(5) Exits Top Quartile
			Panel A: Treated		
Transition×(d<15)	0.024	0.0073	0.0065	0.0077	0.0042
	(0.0062)***	(0.0030)**	(0.0021)***	(0.0014)***	(0.0012)***
Free×(d<15)	0.083	0.027	0.023	0.025	0.017
	(0.023)***	(0.012)**	(0.0062)***	(0.0053)***	(0.0040)***
Relative Effect	1.67	1.18	1.72	2.41	1.68
			Panel B: Moderately Treated		
Transition×15<d<30)	0.0086	0.0049	0.0018	0.0018	0.0011
	(0.0028)***	(0.0013)***	(0.00076)**	(0.00064)***	(0.0012)
Free×(15<d<30)	0.026	0.013	0.0072	0.0077	0.0044
	(0.0095)**	(0.0044)***	(0.0025)***	(0.0023)***	(0.0037)
Relative Effect	0.53	0.57	0.54	0.75	0.43
Mean of Dep. Var.	**0.049**	**0.023**	**0.013**	**0.010**	**0.010**
R2	0.68	0.62	0.67	0.67	0.62
F-stat	6.45	6.77	5.50	20.8	6.53
Observations	843,287	843,287	843,287	843,287	843,287

Notes: The table presents difference-in-differences estimates from Equation (1). The dependent variable is the cumulative stock of FTE exits as a share of 1998 employment. Column (1) shows the overall effect. Columns (2)-(5) decompose the effect by the worker's quartile in the 1998 wage distribution residualized by age, age squared, and gender. All regressions include establishment and time fixed effects, as well as local labor market (NUTS-III) time trends. Standard errors, clustered by local labor market, are in parentheses (* p<0.1, ** p<0.05, *** p<0.01). Source: INPS data.

margin of adjustment. Consistent with the findings of Manning and Petrongolo (2017), who show that local labor market shocks propagate over space, I find quasi-experimental evidence of a "ripple effect", where the negative labor supply shock at the border pulls in workers from adjacent areas. Figure 6 documents the pattern of job-to-job transitions within Italy after the reform. The panels show a significant and sustained increase in workers moving from firms in the control regions to firms in the treated regions closer to the border. At the same time, there is no corresponding increase in worker flows in the opposite direction.

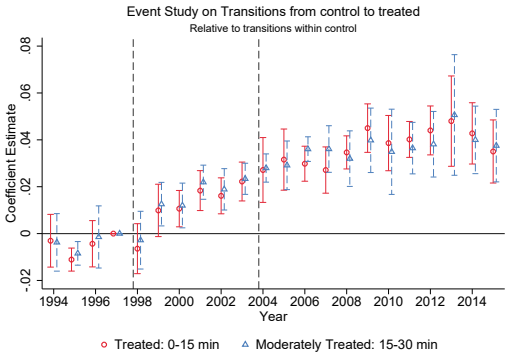
This pattern of internal mobility has important implications for the identification strategy. The directional flow of workers towards the border, rather than away from it, suggests that the negative effects documented in the treated regions are likely a lower bound, as the inflow of replacement labor from other parts of Italy partially mitigates the shock. While these ripple effects raise a potential concern regarding the Stable Unit Treatment Value Assumption (SUTVA), the quantitative impact on the control group's vast labor market is much smaller. In addition, census data show total employment remained stable across the three groups, with a modest increase in the moderately treated group (see Figure 7b) I further assess the validity of the SUTVA assumption in Section 9.[25]

The characteristics of these distinct worker groups, summarized in Table 10, reveal clear patterns

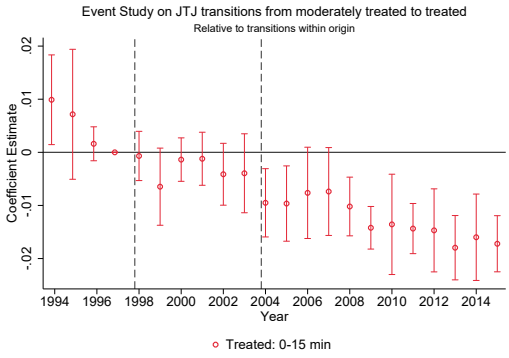
[25]A potential concern is that workers might first move to a border firm as a stepping stone to a job in Switzerland, which could upwardly bias the exit estimates. This is unlikely to be a primary channel, as it would involve a worker leaving a stable job for a new one with the added risk of unemployment before securing a position abroad.

Figure 6: The Effect of Labor Market Integration on Internal Job-to-Job Transitions

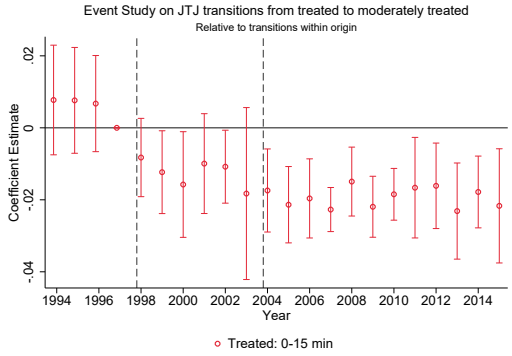
(a) From control to treatments



(b) From MT to T



(c) Transitions from T to MT



Notes: The figure plots coefficients and 95% confidence intervals from the event study specification in Equation (2). The dependent variable is the number of workers making a job-to-job transition between regions, scaled by the total number of transitions in the origin region. Panel (a) shows flows from the control region to the treated (0–15 min) and moderately treated (15–30 min) regions. Panel (b) shows flows from the moderately treated to the treated region. Panel (c) shows the reverse flows from treated regions to the moderately treated ones. All regressions include firm and year fixed effects, NUTS-III specific time trends, and a Bartik control. Standard errors are clustered at the local labor market level. Source: INPS data.

of firm adjustment that shifted after the reform. Compared to the incumbent stayers—who are older, more experienced, and higher-paid—each group shows a unique profile. Exiting workers, for instance, are observably younger and less experienced before the reform, but the post-reform cohort of leavers is significantly older and more experienced, slightly more likely to be drawn from services and stable in manufacturing jobs, while their wage gap with incumbents narrowed considerably. Internal movers display the same pattern in terms of age, experience, wages and sectors between pre and post-reform periods, and come from larger firms. This suggests that border firms substituted with broadly similar workers on the above characteristics after the shock. Newly hired workers represent the most distinct group. Both before and after the reform, they are substantially younger, have almost no prior work experience, earn the lowest wages, and are more likely to be employed in traditional services. The most striking post-reform change for all groups of movers is the dramatic increase in precarious employment; they became far more likely to be on fixed-term contracts and to work part-time compared not only to incumbents but also to the pre-reform cohorts.

6 The Extensive Margin: A Modest Decline in the Number of Firms

The large and sustained outflow of workers from the Italian border region triggered adjustments on both the extensive and intensive margins for local firms. In this section, I first document the modest net decline in the number of active firms in the short-term, a result of both increased exits and suppressed entries. Following the outflow of workers, the number of firms operating in the border region declined. Column 1 of Table 4 shows the effect of the integration of the labor market on the net entry of firms at the municipality level, weighting the regressions by the total number of firms in the municipality in 1998. The estimates show a statistically significant net decrease in the number of firms in both the treated (0–15 minutes) and moderately treated (15–30 minutes) regions during the transition period. Point estimates indicate that, taken together, treated municipalities lost between 2 and 2.5 percentage points of firms they had in 1998, which translates to an average of 140 fewer firms in the market and approximately 1,800 job positions.[26] Columns 2 and 3 decompose this net effect into firm exits and entries. Neither coefficient is statistically significant on its own, suggesting the overall effect is a combination of both, as better shown in section 8.

The descriptive statistics in Table 11 reveal the selection patterns along the extensive margin.

[26]These numbers are derived multiplying the estimated coefficients in transition by the total number of firms in each group then multiplied by their average size in 1998.

Table 4: Entry and Exit of Firms

	(1) Net Entry	(2) Entry	(3) Exit
	Panel A: Treated		
Transition×(d<15)	-0.012	-0.0019	0.010
	(0.0059)**	(0.015)	(0.016)
Free×(d<15)	-0.026	0.0044	0.030
	(0.016)	(0.035)	(0.033)
	Panel B: Moderately Treated		
Transition×(15<d<30)	-0.011	-0.0022	0.0083
	(0.0040)**	(0.014)	(0.016)
Free×(15<d<30)	-0.021	-0.023	-0.0026
	(0.017)	(0.024)	(0.034)
Mean of Dep. Var.	**0.10**	**0.30**	**0.20**
R2	0.77	0.94	0.96
F-stat	2.87	5.46	14.1
Observations	13,762	13,762	13,762

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table presents results of municipality-level DiD regressions following equation (1). All regressions account for period fixed effects, and linear trends per NUTS-III region. The dependent variable in column 1 is cumulated net entry of firms over total number of firms in a municipality in 1998. Cumulated net entry is defined as number of new firms minus number of firms who exit, cumulated over the years. The dependent variable in column 2 is cumulated exit of firms and dependent variable in column 3 is cumulated entry of firms both as a share of the total number of firms in a municipality in 1998. Transition is a dummy equal to one between 1999 and 2003, whereas Free is one from year 2004 onward. $I(d_j \leq x)$ and $I(y < d_j \leq z)$ indicate whether a firm is located less than x travel minutes or between y and z travel minutes from the next border crossing, respectively. Regressions are weighted by total number of firms in a municipality in 1998. INPS data.

Firms that exit the market post-reform are observably different from those that stay; they are significantly smaller, have lower value added, and are more concentrated in traditional manufacturing. In contrast, new entrants are smaller still but are more likely to be in traditional services, particularly in the restaurant and accommodation sector. This suggests that the labor supply shock may have altered the industrial composition of the border region, with a shift away from manufacturing and toward traditional services. Incorporated firms are the most resilient, their share is much higher than in pre-reform.[27]

7 Adjustments on the Intensive Margin: Surviving Firms

While the labor outflow led to a modest decline in the number of firms, the most significant adjustments occurred on the intensive margin within the firms that remained active. This section details how surviving firms managed the large-scale loss of their workforce, focusing first on employment and turnover before turning to other adjustment margins such as wages and productivity.

7.1 Employment and Turnover

A key finding of this paper is that surviving firms, despite facing a massive labor outflow, managed to keep their total employment levels stable. They achieved this by increasing their rate of hiring to counterbalance the increase in separations. Table 5 presents the difference-in-differences estimates for these flows. During the "Free Access" period, firms in the most treated region (0–15 minutes) experienced a 39 percentage point increase in total separations relative to control firms. This was almost perfectly offset by a 40 percentage point increase in hiring. The effects become smaller but still significant for moderately treated firms (15–30 minutes), which saw separations and hiring increase by 30 and 32 percentage points, respectively. The effects during the transition period were positive and significant, but smaller in magnitude. This near one-for-one replacement of separating workers with new hires resulted in a dramatic increase in labor market churn, causing the total turnover rate – defined as the sum of full-time equivalent hiring and separations – to increase by 66 and 51 percentage points in the most treated firms. Aggregating the estimated separation flows, multiplying the coefficients of interest in table 5 by the initial size and number of firms in the two treatment groups implies a total outflow of almost 78,000 workers from the treated regions, a figure consistent with the number of cross-border commuters reported in the Swiss data, also

[27] See Table 9.

showing my exit variable is conservative, and confirming the large scale of the shock.

Table 5: The Effect of Labor Market Integration on Hiring, Separations, and Exits

	(1) Hirings	(2) Separations	(3) Separations resulting in exits	(4) Turnover
		Panel A: Treated		
Transition×(d<15)	0.11	0.12	0.024	0.19
	(0.054)**	(0.051)**	(0.0062)***	(0.085)**
Free×(d<15)	0.40	0.39	0.083	0.66
	(0.21)*	(0.18)**	(0.023)***	(0.32)**
Relative Effect	0.37	0.41	1.67	0.35
		Panel B: Moderately Treated		
Transition×(15<d<30)	0.10	0.11	0.0086	0.19
	(0.046)**	(0.050)**	(0.0028)***	(0.085)**
Free×(15<d<30)	0.32	0.30	0.026	0.51
	(0.14)**	(0.14)**	(0.0095)**	(0.26)*
Relative Effect	0.30	0.32	0.53	0.27
Mean of Dep. Var.	**1.08**	**0.96**	**0.049**	**1.89**
R2	0.69	0.69	0.68	0.74
F-stat	2.90	6.78	5.22	3.33
Observations	843,287	843,287	843,287	843,287

Notes: The table presents difference-in-differences estimates from Equation (1). The dependent variable in each column is the cumulative full-time equivalent (FTE) flow of hiring, separations, or exits, scaled by the firm's total employment in 1998. "Transition" is an indicator for the years 1999–2003, and "Free" is an indicator for 2004 onward. The coefficients show the effect for firms in the treated (0–15 min) and moderately treated (15–30 min) regions relative to the control region. All regressions include firm and period fixed effects, as well as NUTS-III region linear time trends. Standard errors, clustered by local labor market, are in parentheses (* P<0.1, ** P<0.05, *** P<0.01). Source: INPS data.

7.2 Wages, Productivity, and Capital

While surviving firms maintained their employment levels, the shock from the labor outflow triggered significant adjustments on other intensive margins. Firms in the most treated region saw a decline in productivity and reduced wage growth. In contrast, firms in the moderately treated region, facing a weaker outflow in a thicker labor market, did not suffer productivity losses, and managed to increase wages for their incumbent workers.

Table 6 shows the effects on these margins, where firm-level regressions are weighted to account for the unequal dispersion of productivity concentrated within medium-large firms.[28] In line with

[28] See Calligaris et al. (2018). In section 9 I replicate this table including only *Cerved* firms for which balance sheet

Table 6: The Effect of Labor Market Integration on Firm-Level Adjustment Margins

	(1) Log Firm Size	(2) Log Wage	(3) Log Value added per capita	(4) Log Value Added	(5) TFP	(6) Log Assets per capita
			Panel A: Treated			
Transition×(d<15)	-0.011	0.0022	-0.065	-0.069	-0.072	0.055
	(0.016)	(0.0040)	(0.041)	(0.034)*	(0.031)**	(0.050)
Free×(d<15)	-0.015	-0.014	-0.075	-0.076	-0.095	0.068
	(0.034)	(0.0052)**	(0.024)***	(0.033)**	(0.021)***	(0.021)***
			Panel B: Moderately Treated			
Transition×(15<d<30)	-0.016	0.0047	-0.0095	-0.035	-0.0087	0.0066
	(0.013)	(0.0023)**	(0.017)	(0.022)	(0.013)	(0.024)
Free×(15<d<30)	-0.0064	0.0073	-0.0077	0.0041	-0.0033	0.069
	(0.020)	(0.0055)	(0.014)	(0.019)	(0.0096)	(0.022)***
R2	0.87	0.39	0.61	0.86	0.69	0.75
F-stat	3.39	36.9	3.97	2.31	10.2	7.47
Observations	843,287	13,319,577	270,497	270,497	267,493	279,970

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table presents results of establishment-level DiD regressions following equation (1). All regressions account for establishment fixed effects, period fixed effects, and linear trends per NUTS-III region. The dependent variable in column 1 is log FTE employment. The dependent variable in column 2 is average log weekly wages; treatment is defined at the municipality of the establishment, but observations are workers within a firm. The dependent variable in column 3 is log value added per employee; in column 4, log total value added; in column 5, TFP; and in column 6, log total assets per employee. "Transition" is a dummy equal to one between 1999 and 2003, whereas "Free" is one from year 2004 onward. Firm-level regressions are weighted for the average establishment FTE size. Source: INPS and *Cerved* data. Columns 3-6 rely on firms for which balance sheets data are available.

the evidence presented in Section 7.1, all surviving firms, in both the 0–15 minutes and 15–30 minutes bins, manage to keep employment stable. The point estimates are small, negative, and not statistically different from zero, which is consistent with the pattern of hiring counterbalancing separations. The two treatment groups show starkly different outcomes in terms of wages and productivity. In the most treated region (0–15 minutes), average log weekly wages declined by a significant 1.4% during the free access period (Column 2). This wage suppression appears to be following an earlier fall in productivity: TFP declined in the short term (Column 5), while in the free access period, value added per worker dropped by 7.5% (Column 3). In contrast, firms in the moderately treated region (15–30 minutes) experienced an average 0.7% increase in wage growth and suffered no significant productivity losses. The only margin on which both groups responded similarly was capital investment; firms in both regions increased their capital intensity, with total assets per employee rising by approximately 7% (Column 6). However, given the high dispersion in this variable (detailed in Section 8), this finding should be interpreted as purely suggestive.

The event studies in Figure 8 further clarify these dynamics. In the treated region, productivity begins to decline in the first years of the reform, while the drop in wage growth follows later and

information is available, finding that results have a similar magnitude and direction as in the full sample.

persists throughout the analysis period. This timing suggests that firms, after suffering immediate productivity losses, were subsequently forced to adopt a cost-saving strategy on the wage margin to remain viable. Although these estimates are based on a sample of surviving firms and could be affected by attrition, the fact that firm density is similar across the three groups, that effects on the extensive margin are small, and that a higher share of incorporated firms survive in the treated region, suggests these firms were highly resilient. If anything, this positive selection implies that the negative productivity estimates may represent a lower bound. Given that I do not observe a different loss of high-skilled labor across the two treatment groups, although with imperfect proxies, the evidence also points to a role for frictions in replacing high qualified human capital in a constrained labor market. The wage analysis in the next section shows how this can be linked to labor market imperfections.

7.3 Decomposing the Wage Result

The wage dynamics observed in the most affected regions may not necessitate an alternative theoretical framework; rather, they are consistent with standard competitive forces once labor market imperfections are taken into account. In a setting characterized by monopsonistic elements or institutional rigidities, equilibrium wages reflect the interaction between workers' outside options and the firm's marginal costs. In the 0–15 minute region, firms suffer significant efficiency losses that, when combined with the already high costs of matching the Swiss wage premium, appear to constrain their capacity to compete for labor on the wage margin.

This adjustment process is consistent with the logic of a dual labor market:[29] firms facing an inward shift in the supply of "primary" workers may rely more heavily on a secondary labor pool consisting of younger workers, apprentices, or those on fixed-term contracts. This shift toward a more "junior" workforce lowers the average firm wage via composition, while the nominal pay for incumbent "stayers" remains stable. The lack of higher wage growth for incumbents can be linked to the intuition in Jäger et al. (2024): if the departing workers possessed skills that were complementary to those of the remaining staff, the difficulty of finding adequate replacements in a thin market could reduce the marginal productivity of stayers, offsetting upward wage pressures. Finally, I show this pattern is also reinforced by institutional factors such as Employment Protection Legislation (EPL), which tend to prioritize employment stability over wage flexibility. Evidence below shows these factors play a role.

[29] See Boeri and van Ours (2021).

Table 7 evaluates these adjustments empirically by reporting the impact of the reform on log weekly wages across different worker samples. I decompose the effect using worker-level regressions, which allow for the inclusion of individual fixed effects and provide more robust standard errors. This table separates the effects on incumbent and newly hired workers.The negative average wage effect in the highly treated region is primarily a compositional outcome: while the average wage within the firm decreases because of newly hired workers, the estimates for incumbent stayers remain statistically insignificant and near zero. This evidence supports the interpretation that firms in thin markets navigate the scarcity of primary labor by adjusting workforce composition and utilizing secondary labor segments, rather than by matching the Swiss wage premium or reducing the earnings of their core incumbent workforce.[30]

Column (2) shows that controlling for worker fixed effects halves the negative average wage estimate in the most treated firms and renders it insignificant, pointing to the importance of worker characteristics. The wage effects for incumbents (Column 5) are not statistically different from zero, and the same holds for their unobservable quality (Column 6). This finding is also consistent with Jäger et al. (2024), which shows that in frictional labor markets with employer market power, incumbent workers can suffer negative wage spillovers from exits of coworkers with complementary skills to those workers remaining. The lack of higher wage growth for incumbents can also be tied to a higher use of employment protection tools; [31] On the other hand, newly hired workers in this region experience a decline in wage growth of 3.3% after controlling for their individual fixed effects (Column 8). Since the average quality of these new hires, as measured by their AKM-style fixed effects, is not different from that of new hires in the control group (Column 9), this suggests lower wage growth might not be attributed to the unobservable quality of these workers. This holds for internal movers starting a new job in these new firms, as controlling for workers fixed effects excludes workers starting a new job after the free access phase. This wage suppression for new hires is also consistent with the increased use of fixed-term and apprentices contracts and a compositional change related to the hiring of younger, less experienced workers, as shown in Figure 9 and already in descriptive table 10.

In the moderately treated firms (15–30 min), where the accessible labor market for these firms

[30]This specification includes workers transitioning and working in firms based in Milan, not losing their full employment histories; Table 12 shows unchanged results when these workers are included.

[31]Instead of laying off workers, firms may save on labor costs by opting for the so-called *Cassa Integrazione Guadagni* (CIG), where during temporary production slumps the government subsidizes a portion of the employees' salary (usually 80%). Excluding these subsidies from the wage calculation, table 13 shows indeed smaller insignificant effects for incumbents in the treated group and stronger positive effects for stayers in the moderately treated one.

has a much larger size, the results align closer with the standard theory in a perfect labor market. The positive wage effect is driven entirely by incumbent workers, whose wages increased by a significant 0.57% after controlling for individual characteristics (Column 5) coupled with higher promotion rates (Column 10).

Table 7: Decomposition of the Wage Effect: Incumbents vs. New Hires

	All workers			Incumbent			Entrant			
	Log Wage (1)	Log Wage (2)	Worker AKM (3)	Log Wage (4)	Log Wage (5)	Worker AKM (6)	Log Wage (7)	Log Wage (8)	Worker AKM (9)	Share Promotions (10)
A. Treated										
Free×($d < 15$)	-0.014	-0.0078	0.0032	-0.013	-0.010	0.00067	-0.028	-0.033	0.0072	0.062
	(0.0054)**	(0.011)	(0.0047)	(0.0063)*	(0.0098)	(0.0036)	(0.0100)***	(0.0099)***	(0.010)	(0.020)***
B. Moderately Treated										
Free×($15 < d < 30$)	0.0073	0.0079	0.0047	0.0079	0.0057	0.0021	0.0061	0.0010	0.011	0.039
	(0.0055)	(0.0033)**	(0.0038)	(0.0033)**	(0.0029)*	(0.0031)	(0.014)	(0.012)	(0.0046)**	(0.019)**
Obs.	19,918,528	19,216,134	21,402,922	10,807,165	10,711,562	11,801,550	4,166,667	2,409,646	6,662,065	1,111,270
Firm and Time FE	X	X	X	X	X	X	X	X	X	X
Nuts III Trends	X	X	X	X	X	X	X	X	X	X
Worker FE	.	X	.	.	X	.	.	X	.	.

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table presents results of worker-level DiD regressions. While treatment is at the municipality of the establishment level, the unit of observation is the worker. All regressions account for firm and year fixed effects, as well as linear trends per NUTS-III region. The dependent variable is the log weekly wage and AKM-style worker fixed effect. Columns (1)-(3) show the average effect. Columns (4)-(6) decompose the wage effect for incumbents and columns (7)-(9) for new hires, with and without worker fixed effects, and also the result on AKM. Incumbents are workers employed in a firm of a treated municipality in the pre-reform period, while new hires are workers starting their first job in a treated municipality firm after this period. AKM workers fixed effects are estimated in the pre period before full liberalization and used as an outcome in (3), (6) and (9). Column (10) shows the effect on the probability of promotion, where the outcome is collapsed at the firm level and normalized to the employment share in 1998. "Transition" is an indicator for 1999–2003, and "Free" is for 2004 onward. Source: INPS data.

8 Heterogeneity by Sector and Treatment Intensity

Aggregate firm-level adjustments mask significant heterogeneity across industrial sectors, which I investigate by decomposing the results into four groups: *high-tech manufacturing*, *low-tech manufacturing*, *knowledge-intensive services*, and *traditional, non-knowledge-intensive services*. A reduced sample size and the lack of a reliable skills measure make it difficult to perfectly link losses of qualified labor to firm performance. For instance, while exits by qualification show significant losses across all groups (from managers to apprentices), they are scattered across industries without a clear pattern. The negative labor supply shock imposed several costs on firms, including the erosion of firm-specific human capital, higher search costs in a tighter labor market, and increased administrative burdens. While the precise weight of each channel is unclear, the evidence reveals a clear pattern: negative effects are most pronounced for firms that rely heavily on high-skilled labor and fade further from the border. In contrast, firms in low-skill intensive sectors experiencing weaker outflows were more resilient, with some showing positive wage effects.

On the extensive margin, the net decline in firms in treated regions is driven by different dy-

namics. In high-tech manufacturing, the negative net entry results from a significant drop in firm creation that is only partially offset by a simultaneous reduction in firm exits. This suggests that while existing high-tech firms are resilient, the labor outflow acts as an entrepreneurial drain on the sector, a finding consistent with Anelli et al. (2023) and mirroring the positive effects on firm creation found on the Swiss side of the border by Beerli et al. (2021). Conversely, traditional service firms experience higher churn; a large increase in firm exits outweighs a simultaneous rise in new entries, also leading to a net decline.[32]

On the intensive margin, the key results of this heterogeneity analysis are summarized in Figure 10. Panel (a) shows the effects for the treated firms (0–15 minutes from the border), while Panel (b) shows the effects for the moderately treated firms (15–30 minutes). The results reveal a clear pattern in the most intensely treated region. Firms in high-tech manufacturing suffered the most, experiencing significant and persistent losses in productivity. In line with these survival strategies, these firms appear to complement their wage-setting adjustments with a modest reliance on institutional flexibility through the wage guaranty fund (*Cassa Integrazione Guadagni*, CIG) to manage labor costs during the transition (see column 11 in Appendix Tables 16 and 17). These negative effects dilute sharply with distance. In the moderately treated region, the picture is markedly different. Here, low-tech manufacturing firms show positive adjustments, with significant increases in wages for incumbent workers. This suggests that in wider markets with more easily substitutable labor, firms can better absorb the competitive pressure and are more likely to raise wages to retain their existing workforce, an outcome consistent with findings on the French border (Hafner and Hedtrich, 2024) and with the work of Moretti and Yi (2024) on the benefits of larger labor markets.

The results for traditional services (e.g., restaurants and accommodation) are consistent with these patterns. In the treated region, these firms show much smaller and insignificant effects on productivity and wages, and this is the only sector to display a significant increase in firm entry. This resilience may be explained by positive demand spillovers from commuters' higher earnings, which could offset the negative labor supply shock. Across all sectors, however, the estimates of an increase in capital intensity are largely imprecise, limiting the interpretation in favor of a mechanism for substituting away from labor. Suggestive evidence from survey data further indicates that treated firms reported greater difficulty in finding adequate workers (see Table 18).

[32]The same decomposition does not yield significant results in the (15-30) min group.

Table 8: Firm Entry and Exit: Treated (0-15 min)

	(1) Full	(2) High Tech Manufacturing	(3) Knowledge Intensive Services	(4) Low Tech Manufacturing	(5) Traditional Services
Panel A: Firm Entry					
Transition×(d<15)	-0.0019	-0.026	0.014	-0.0099	0.020
	(0.015)	(0.0064)***	(0.010)	(0.0062)	(0.0096)**
Free×(d<15)	0.0044	-0.057	0.025	-0.041	0.077
	(0.035)	(0.015)***	(0.023)	(0.016)**	(0.032)**
Mean of Dep. Var.	**0.30**	**0.069**	**0.031**	**0.12**	**0.079**
Panel B: Firm Exit					
Transition×(d<15)	0.010	-0.016	0.015	-0.018	0.029
	(0.016)	(0.0064)**	(0.014)	(0.014)	(0.013)**
Free×(d<15)	0.030	-0.046	0.030	-0.056	0.10
	(0.033)	(0.017)**	(0.031)	(0.036)	(0.035)***
Mean of Dep. Var.	**0.20**	**0.044**	**0.013**	**0.098**	**0.045**
Observations	13,762	13,762	13,762	13,762	13,762

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table presents results of municipality-level DiD regressions following equation (1). All regressions account for period fixed effects, and linear trends per NUTS-III region. The dependent variable in panel A is cumulated entry of firms and the dependent variable in panel B is cumulated exits, both as share of total number of firms in a municipality in 1998. Regression are weighted using the total number of firms in a municipality. Column (1) reports the results from the full sample in Table 3. Columns (2)-(5) report the effects disaggregated by industrial sector as defined in Figure 10.

9 Robustness and Threats to Identification

This section assesses the validity of the main findings by addressing several potential threats to identification and testing the sensitivity of the results to alternative specifications and sample definitions. The key identifying assumption is that, conditional on controls, outcomes in the treated and control regions would have followed parallel trends in the absence of the reform. While the event studies provide graphical support for this assumption, other concerns remain. The following tests show that the main results are robust.

To address concerns about confounding factors, such as the ratification of the MRA trade agreement[33] or exchange rate fluctuations, I show that the exits results are robust to the regression specification and to the exclusion of potentially affected industries. Figure 11 plots the raw means of my exit variable. The analysis exploits extremely local variation where treatment and control firms fall within a narrow distance span, making large differences in exposure to these other shocks

[33] Ariu (2022) studies the effects of the same labor mobility on exports of Swiss firms. He finds that mobility leads to higher quality products through an upgrading of the quality of inputs from the origin country of the migrants because of more intense relationships with already existing sellers. He does not find an effect on the quantity of input or of the increase in exports to the country of origin of the migrants.

unlikely. I control for granular CZ (NUTS-III level) time trends to net out any linear, local labor market-specific variation, and for any remaining nationwide variation in industry composition using a Bartik-style control. The main findings on worker exits are robust to these demanding specifications, as well as to using an alternative firm location measure based on the residence of the median worker, rstricting the sample to incorporated firms only, and excluding industries affected by the MRA agreement (Figure 12; Table 19). As main results are concerned, to further validate the choice of control group, I conduct a bootstrap exercise where I randomly select a 20% sample of control municipalities 200 times with replacement and evaluate the distribution of the estimated coefficients. The results, shown in Figures 13 and 14, confirm that the estimated negative effects on wages and productivity for treated firms, and the positive wage effects for moderately treated firms, are robust and not driven by a particular subset of control firms. Main results are robust to restricting the sample to Cerved firms only (Table 20), to the inclusion of firms in Milan (Table 21).

A second key test addresses the potential for unobserved non-linear spatial spillovers, and the validity of the Stable Unit Treatment Value Assumption (SUTVA). While the internal mobility of workers from control to treated regions is smaller in magnitude, I conduct a spatial placebo test to ensure the main effects are not driven by broader regional trends. I re-define the treatment group as firms located 30-45 minutes from the border and the control group as firms 46-75 minutes away. The results, shown in Appendix Figure 15 and Table 22, indicate no significant effect on worker exits at this 30-minute threshold. The point estimates for all main outcomes are close to zero, supporting the interpretation that the effects documented in the main analysis are indeed driven by the intense labor market shock at the immediate border. Also, to further mitigate any remaining concerns about spillover effects contaminating the control group, I re-estimate the main results using a more distant control group of firms located significantly further away. This specification, reported in Appendix Table 23, uses a 4% random sample of firms and a control group located between 4 and 6 hours of commuting time from the border, an area plausibly unaffected by the shock. The results from this conservative test confirm the paper's main findings, lending strong support to the causal interpretation of the estimates.

Finally, I test the sensitivity of the results to the sample restriction on firm size (3 to 250 employees) by re-estimating the main specifications on a 4% random sample of firms of all sizes. The results, reported in Appendix Table 24, confirm the main findings. Worker exits are significantly higher in the treated regions, and the divergent pattern of negative wage effects in the treated region and positive wage effects in the moderately treated one holds with similar magnitudes,

although lacking statistical precision. The effects on productivity are also confirmed in magnitude and direction, with smaller losses as distance increase, while the positive effect on capital, like in the heterogeneity exercise, lacks statistical precision. This robustness check also reveals an important dynamic regarding overall employment. While census data show a slight expansion of employment in these labor markets, this was smaller than the total outflow of CBWs. This aggregate result masks a heterogeneous response by firm size: the overall employment stability is driven by the resilience of small-medium enterprises, while I detect a significant employment shrinkage in the largest firms (those with more than 250 employees) in the moderately treated region.

10 Conclusion

This paper studies firm-level adjustments to a large-scale, negative labor supply shock. I exploit the labor market integration between Italy and Switzerland as a natural experiment where wage differentials, exacerbated by different tax-benefit systems, generated an unprecedented outflow of Italian workers to the Swiss labor market. I show how the effects of worker outflows are not uniform; they depend critically on the intensity of the shock and the size of the local labor market. In smaller, more constrained markets at the immediate border, firms facing an intense outflow show a decline in productivity and adopt a cost-minimization strategy: they replace the workers they lost but do so by hiring younger, less experienced employees on fixed-term contracts, leading to lower average wages. In contrast, firms in wider, moderately treated areas are able to absorb the weaker shock without suffering productivity losses, and increase wages for incumbent workers. These findings can be rationalized within the standard competitive model once labor market imperfections are taken into account.

These findings have important policy implications as the setting of this study is the byproduct of the interactions between different tax-benefit systems, commuting costs, and local labor market conditions. The negative effects on high-skill intensive firms in constrained local markets suggest that policies aimed at mitigating brain drain should be highly targeted. For these specific areas, governments might consider policies that help reduce the high costs of turnover that firms face, for example by reducing administrative burdens associated with hiring or by supporting training programs that can more quickly replace lost skills. For high-income countries facing demographic challenges, the interaction between high-skill emigration and local labor market constraints could create a vicious cycle, making the choice of informed policies even more critical.

This research calls for further investigation into several key areas. A deeper understanding of how firms' investment decisions in physical versus human capital respond to skill scarcity in different market environments is needed. Future work should also aim to disentangle the distinct roles of general human capital loss, the erosion of firm-specific knowledge, and the administrative or bureaucratic costs associated with high turnover, as these appear to be key drivers of the heterogeneous firm responses documented in this paper. A promising avenue for future research involves the use of linked cross-border longitudinal datasets. Observing the complete work history of individuals across the border would allow for a precise quantification of the roles played by commuting costs, wage differentials, and tax systems, while clarifying individual and household factors driving selection into cross-border commuting or migration. Such granular evidence would also enhance the understanding of firm-level adjustments by providing a clearer picture of the specific outside options effectively facing the local workforce.

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A Figures and tables

Table 9 presents detailed summary statistics for firms in the three groups, averaged over the pre-reform period (1994–1998). The sample consists of 55,524 firms active in 1998: 2,964 in the treated group (0–15 min), 9,487 in the moderately treated group (15–30 min), and 42,710 in the control group. The differences in the number of firms across the three groups relate to the mountainous geography of this territory, which concentrates economic activity in specific areas.

Employment Dynamics and Wages. In Panel A, the yearly share of exits ranges between 1% and 2%, with treated firms already experiencing a significantly higher share of exits before the reform, with a magnitude of 0.5 percentage points. The share of hiring and separation are broadly similar. The average firm in the control group has 14.8 FTE employees; firms in the moderately treated group have 1.4 fewer employees, while treated firms are almost 2.3 employees smaller. The average number of weeks worked is around 40 in the control group. Compared to them, treated firms have on average 1.6 fewer weeks of work, while moderately treated firms work 0.4 fewer weeks. Also, treated firms pay on average 63 euros less per week compared to an average of 515 euros per week in the control group.

Firm Characteristics. Panel B shows there is no significant difference between the three groups in the rate of firm closure in 1998. Firms in the treated group are more likely to be in manufacturing. Both treatment groups have fewer incorporated firms for which balance sheet data is available.

Worker Characteristics. As shown in Panel C, the share of women is similar. 53% of workers in the control group have a blue-collar qualification; this share is higher in treatment groups. There are no big differences across the three groups in the share of foreigners, blue collar or fixed-term contracts.

Distance. By construction, the average firm in the control group is 48 minutes away from the border. The average moderately treated firm is 24.7 minutes away, and the average treated firm is 12.6 minutes away.

Table 9: Summary Statistics and Pre-Reform Balance, pre-1998

	(1) Pre 1998 Control Group	(2) Pre 1998 Moderately Treated	(3) Pre 1998 Treatment Group	(4) Pre 1998 Difference (2)-(1)	(5) Pre 1998 Difference (3)-(1)	(6) Pre 1998 STD Difference (2)-(1)	(7) Pre 1998 STD Difference (3)-(1)
Panel A: Labor Outcomes							
FTE Exits on 98 Size	0.032	0.034	0.042	0.0016	0.010	-0.013	-0.080
	[0.15]	[0.089]	[0.099]	(0.00073)*	(0.0013)**		
Yearly Share of Exits	0.013	0.013	0.017	0.00047	0.0042	-0.0078	-0.066
	[0.069]	[0.051]	[0.057]	(0.00035)	(0.00061)**		
Share of Hirings	0.25	0.24	0.25	-0.0096	0.0042	0.011	-0.0047
	[1.22]	[0.34]	[0.31]	(0.0059)	(0.011)		
Share of Separations	0.22	0.20	0.22	-0.013	-0.00057	0.0077	0.00034
	[2.35]	[0.35]	[0.30]	(0.011)	(0.020)		
Share of JTJ within 1 month	0.078	0.068	0.062	-0.010	-0.015	0.0077	0.012
	[1.83]	[0.22]	[0.14]	(0.0089)	(0.016)		
Employment Growth	0.087	0.11	0.11	0.018	0.020	-0.011	-0.012
	[2.31]	[0.43]	[0.40]	(0.011)	(0.020)		
Turnover	1.18	1.15	1.21	-0.025	0.028	0.0048	-0.0053
	[7.37]	[1.41]	[1.38]	(0.036)	(0.064)		
Share of Promotions	0.028	0.031	0.033	0.0027	0.0044	-0.024	-0.040
	[0.13]	[0.080]	[0.082]	(0.00065)**	(0.0011)**		
FTE total employees in year (share)	14.8	13.3	12.4	-1.43	-2.32	0.034	0.055
	[55.7]	[23.4]	[21.5]	(0.27)**	(0.49)**		
Mean weeks PC	40.2	39.8	38.6	-0.46	-1.63	0.043	0.15
	[10.6]	[10.7]	[11.4]	(0.055)**	(0.095)**		
Mean Weekly Wage	515.4	452.5	452.1	-62.9	-63.3	0.29	0.29
	[254.0]	[163.8]	[166.3]	(1.27)**	(2.23)**		
Mean Weekly Imponibile	512.1	449.7	449.2	-62.4	-62.9	0.30	0.30
	[245.3]	[158.0]	[161.9]	(1.22)**	(2.15)**		
Panel B: Firm Characteristics							
Firm closure in the year	0.0094	0.0088	0.0093	-0.00067	-0.00012	0.0071	0.0013
	[0.097]	[0.093]	[0.096]	(0.00050)	(0.00086)		
Firm Active today	0.35	0.38	0.36	0.026	0.0055	-0.053	-0.012
	[0.48]	[0.49]	[0.48]	(0.0025)**	(0.0042)		
Value Added	1367.2	1293.2	1316.6	-74.0	-50.6	0.028	0.019
	[2909.5]	[2428.8]	[2530.3]	(35.5)*	(65.7)		
Total Assets	1016.4	1008.9	1124.4	-7.52	108.0	0.0027	-0.036
	[3067.6]	[2517.1]	[2878.8]	(36.5)	(67.3)		
High-Tech Manufacturing	0.21	0.18	0.14	-0.031	-0.078	0.079	0.21
	[0.41]	[0.39]	[0.34]	(0.0021)**	(0.0036)**		
Low-Tech Manufacturing	0.29	0.43	0.37	0.14	0.085	-0.30	-0.18
	[0.45]	[0.50]	[0.48]	(0.0024)**	(0.0040)**		
Not Know. int. Service	0.32	0.29	0.36	-0.036	0.042	0.078	-0.089
	[0.47]	[0.45]	[0.48]	(0.0024)**	(0.0042)**		
Know. int. Service	0.17	0.10	0.13	-0.072	-0.046	0.21	0.13
	[0.38]	[0.30]	[0.33]	(0.0019)**	(0.0033)**		
MRA affected	0.49	0.57	0.49	0.081	0.0031	-0.16	-0.0061
	[0.50]	[0.50]	[0.50]	(0.0026)**	(0.0044)		
Has CERVED var.	0.25	0.18	0.16	-0.072	-0.090	0.18	0.22
	[0.43]	[0.38]	[0.37]	(0.0022)**	(0.0038)**		
Panel C: Firm Composition							
Women	0.40	0.39	0.38	-0.0091	-0.012	0.0064	0.0081
	[1.97]	[0.40]	[0.38]	(0.0096)	(0.017)		
Foreigners	0.041	0.037	0.040	-0.0040	-0.0012	0.032	0.0090
	[0.15]	[0.10]	[0.12]	(0.00073)**	(0.0013)		
Share Blue Collars	0.53	0.62	0.59	0.092	0.059	-0.26	-0.16
	[0.38]	[0.33]	[0.35]	(0.0019)**	(0.0033)**		
Share Part-Time	0.081	0.076	0.091	-0.0047	0.010	0.028	-0.058
	[0.17]	[0.16]	[0.18]	(0.00089)**	(0.0015)**		
Share Fixed term contract	0.014	0.014	0.014	-0.000059	-0.00023	0.00086	0.0034
	[0.068]	[0.069]	[0.068]	(0.00035)	(0.00060)		
Panel D: Firm Distance							
Driving km from firm to border	49.7	21.3	8.70	-28.3	-41.0	3.13	5.21
	[10.7]	[6.96]	[2.98]	(0.054)**	(0.093)**		
Driving min from firm to border	48.3	24.7	12.6	-23.6	-35.7	3.57	5.56
	[8.34]	[4.24]	[3.59]	(0.041)**	(0.073)**		
Number of obs	272,226	42,735	13,300	314,961	285,526	314,961	285,526
Number of firms	42,710	9,487	2,964	52,197	45,674	52,197	45,674

Notes: The table shows average firm characteristics in the three treatment groups, averaged over the pre-reform years 1994–1998. Column (1) shows firms in the control group ($d_j > 30$ min). Column (2) shows firms in the moderately treated group (15–30 min). Column (3) shows firms in the treated group (0–15 min). Columns (4) and (5) report the raw mean difference between each treatment group and the control group, with standard errors in parentheses (* p<0.05, ** p<0.01). Columns (6) and (7) report the standardized differences for the same comparisons. Source: INPS data.

Table 10: Incumbents vs. Workers by Mobility Status in Pre (1994-1999) and Post-Reform (2000-2015)

	(1) Incumbent Treatment	(2) Pre Exits Treatment	(3) Post Exits Treatment	(4) Pre Movers Treatment	(5) Post Movers Treatment	(6) Pre Entry Treatment	(7) Post Entry Treatment
Panel A: Worker Demographics							
Age	38.8	31.8	38.6	32.0	35.9	23.6	24.8
	[9.98]	[9.23]	[10.6]	[9.22]	[9.76]	[8.45]	[8.94]
Share Female	0.39	0.47	0.43	0.27	0.33	0.45	0.45
	[0.49]	[0.50]	[0.49]	[0.44]	[0.47]	[0.50]	[0.50]
Share Non-Italian	0.059	0.092	0.17	0.041	0.12	0.081	0.24
	[0.24]	[0.29]	[0.38]	[0.20]	[0.33]	[0.27]	[0.43]
Experience (years)	9.56	1.79	9.03	2.02	8.06	0.44	0.39
	[6.11]	[1.44]	[6.61]	[1.33]	[5.51]	[0.29]	[0.28]
Panel B: Labor Outcomes and Job Characteristics							
Weeks Worked	50.3	21.5	22.8	22.7	21.4	20.7	18.4
	[5.80]	[15.6]	[16.3]	[15.3]	[15.2]	[15.1]	[14.1]
Weekly Wage	571.5	449.8	556.9	542.4	551.9	337.8	339.4
	[339.8]	[357.3]	[514.1]	[392.7]	[441.8]	[210.7]	[238.8]
Share Promoted	0.013	0.028	0.024	0.025	0.030	0	0
	[0.11]	[0.17]	[0.15]	[0.16]	[0.17]	[0]	[0]
Share Part-Time	0.11	0.14	0.23	0.075	0.15	0.11	0.21
	[0.31]	[0.34]	[0.42]	[0.26]	[0.35]	[0.31]	[0.41]
Share Fixed-Term Contract	0.018	0.021	0.24	0.030	0.22	0.043	0.34
	[0.13]	[0.14]	[0.43]	[0.17]	[0.42]	[0.20]	[0.47]
Panel C: Qualification Shares							
Blue-collar	0.61	0.72	0.71	0.66	0.63	0.48	0.48
	[0.49]	[0.45]	[0.45]	[0.47]	[0.48]	[0.50]	[0.50]
White-collar	0.35	0.21	0.24	0.28	0.31	0.23	0.21
	[0.48]	[0.41]	[0.43]	[0.45]	[0.46]	[0.42]	[0.41]
Apprentices	0.021	0.043	0.035	0.032	0.045	0.28	0.31
	[0.14]	[0.20]	[0.18]	[0.18]	[0.21]	[0.45]	[0.46]
Managers	0.0097	0.0043	0.0027	0.014	0.0091	0.0024	0.00086
	[0.098]	[0.065]	[0.052]	[0.12]	[0.095]	[0.049]	[0.029]
Panel D: Firm Characteristics							
Firm Size (Avg. Employees)	13.8	12.7	10.9	18.5	19.5	11.5	11.1
	[22.4]	[20.3]	[17.8]	[27.8]	[29.6]	[21.6]	[17.7]
Share High-Tech Manufacturing	0.17	0.12	0.099	0.19	0.15	0.15	0.10
	[0.37]	[0.32]	[0.30]	[0.39]	[0.36]	[0.36]	[0.30]
Share Low-Tech Manufacturing	0.38	0.38	0.37	0.32	0.27	0.37	0.31
	[0.48]	[0.49]	[0.48]	[0.47]	[0.45]	[0.48]	[0.46]
Share Knowledge-Intensive Services	0.15	0.11	0.14	0.093	0.16	0.13	0.14
	[0.36]	[0.31]	[0.34]	[0.29]	[0.36]	[0.33]	[0.35]
Share Traditional Services	0.30	0.38	0.39	0.30	0.41	0.32	0.44
	[0.46]	[0.49]	[0.49]	[0.46]	[0.49]	[0.47]	[0.50]
Number of obs	2,335,697	8,889	57,839	21,741	91,129	35,479	54,919

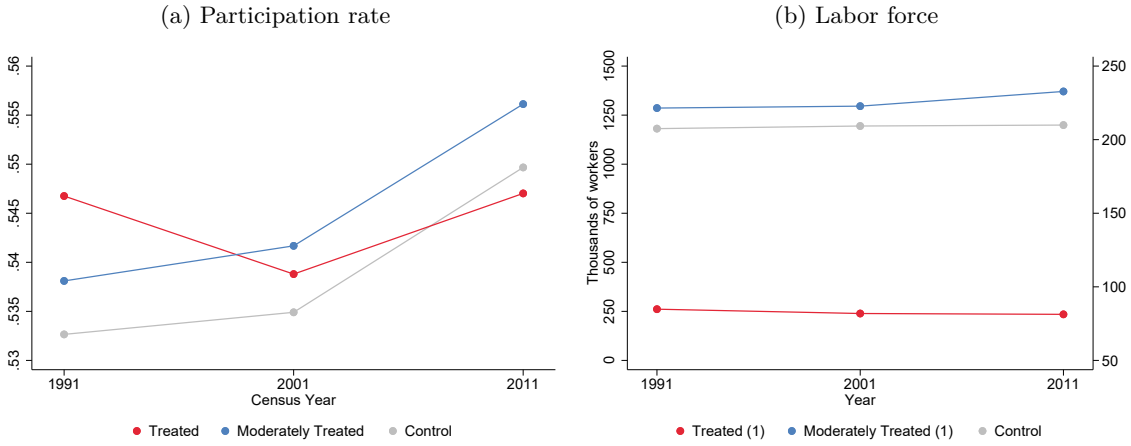
Notes: The table reports mean worker characteristics in the pre (1994-1999) and post-reform period (2000-2015). Column (1) "Incumbents" includes workers employed in treated firms who remain employed in the treated region. Column (2) and (3) "Exits" include workers who separate from treated firms and are classified as emigrants. Column (4) and (5) "Movers" include workers who move from a control region firm to a treated region firm. Column (6) and (7) "New Hires" include all workers newly hired by treated firms. All variables are averaged over the pre or post-reform period. Given the size of the sample, all differences are statistically significant at 1 percent level and therefore omitted. Source: INPS data.

Table 11: Characteristics of Firms by Post-Reform Status: Stayers, Entries, and Exits

	(1) Post-2000 Stayers	(2) Post-2000 Exits	(3) Post-2000 Entries
Panel A: Labor Outcomes			
FTE Exits on 98 Size	0.21	0.25	0
	[0.36]	[0.48]	[0]
Yearly Share of Exits	0.025	0.11	0.037
	[0.074]	[0.24]	[0.096]
Share of Hirings	0.18	0.19	1.00
	[0.22]	[0.32]	[0.018]
Share of Separations	0.19	1.00	0.31
	[0.23]	[0.012]	[0.33]
Share of JTJ within 1 month	0.059	0.51	0.091
	[0.12]	[0.41]	[0.18]
Share of Promotions	0.026	0.022	0.061
	[0.074]	[0.091]	[0.13]
FTE total employees in year	14.4	8.35	9.97
	[36.2]	[19.9]	[17.4]
Mean weeks PC	39.1	20.9	19.6
	[10.9]	[13.9]	[12.2]
Mean Weekly Wage	517.2	535.1	444.7
Panel B: Firm Characteristics			
Value Added	1179.4	627.5	431.1
	[2445.7]	[2225.4]	[1505.9]
Total Assets	1148.9	624.3	543.2
	[3032.3]	[2606.8]	[2524.4]
High-Tech Manufacturing	0.16	0.13	0.10
	[0.37]	[0.33]	[0.30]
Low-Tech Manufacturing	0.38	0.40	0.33
	[0.48]	[0.49]	[0.47]
Know. int. Service	0.13	0.13	0.15
	[0.34]	[0.33]	[0.36]
Traditional Services	0.33	0.35	0.42
	[0.47]	[0.48]	[0.49]
MRA affected	0.50	0.46	0.37
	[0.50]	[0.50]	[0.48]
In CERVED	0.36	0.18	0.40
	[0.48]	[0.38]	[0.49]
Panel C: Firm Composition			
Women	0.41	0.42	0.39
	[0.34]	[0.39]	[0.35]
Foreigners	0.11	0.18	0.23
	[0.20]	[0.30]	[0.30]
Share Blue Collars	0.60	0.64	0.67
	[0.35]	[0.39]	[0.37]
Share Part-Time	0.17	0.20	0.21
	[0.25]	[0.32]	[0.30]
Share Fixed term contract	0.092	0.12	0.24
	[0.18]	[0.25]	[0.32]
Number of obs	178,370	14,058	11,226
Number of firms	19,823	14,058	11,226

Notes: The table reports mean firm characteristics in the post-reform period (2000-2015) for treated firms (0-30 minutes from the border). Column (1) "Stayers" includes firms active in 1998 that survive the entire sample period. Column (2) "Exits" includes firms that exit the market. Column (3) "Entries" includes firms that enter the market. All variables are averaged over the post-reform period. Standard deviations are in brackets. Source: INPS data.

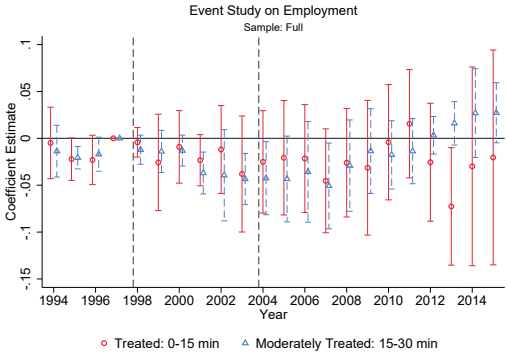
Figure 7: Labor force and participation



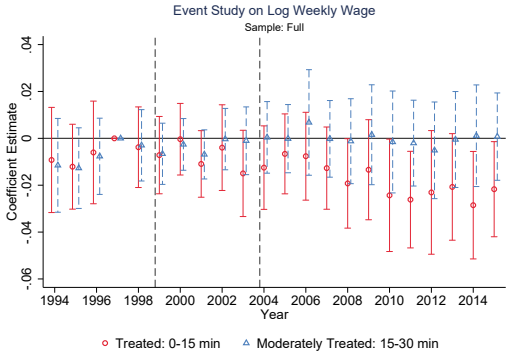
Notes: (1) references the right axis. Author's calculations on Census data.

Figure 8: Event study on main outcomes

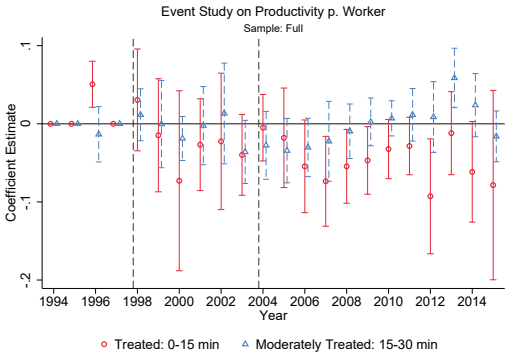
(a) Log size



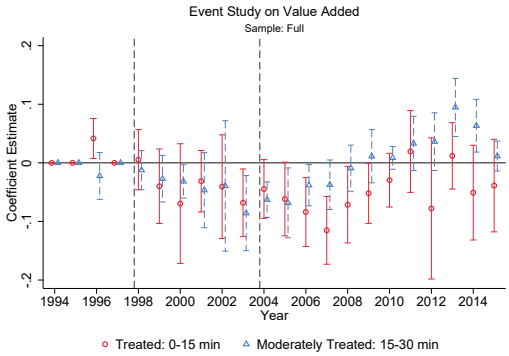
(b) Average log wage



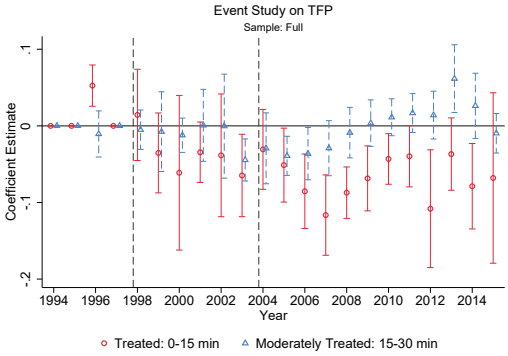
(c) Log value added per capita



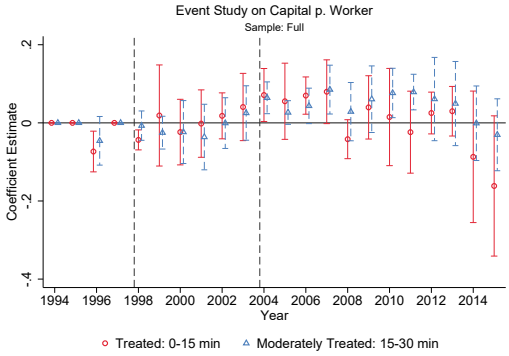
(d) Log value added



(e) TFP

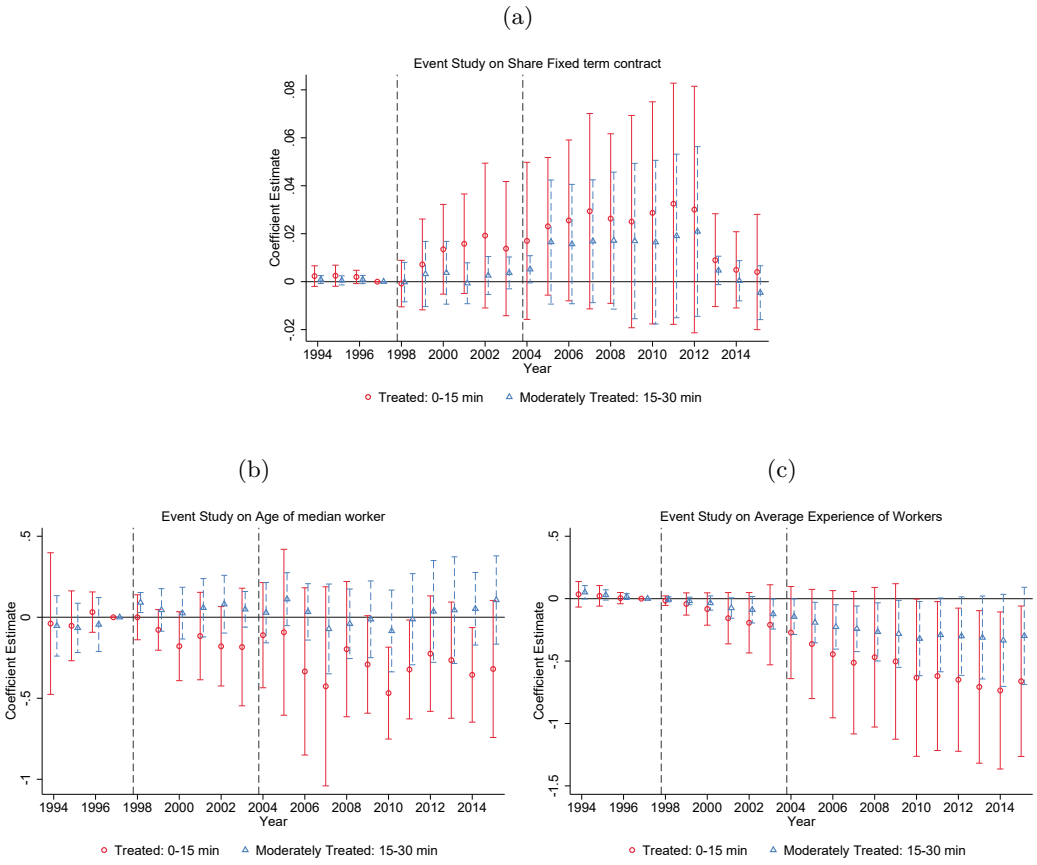


(f) Log assets per capita



Notes: Figure plots coefficient and the 95% confidence interval for the 0-15min distance bin (red circles) and 15-30 min distance bin (blue triangles) of a regression based on equation (2). The dependent variables are the main outcomes reported in table 6. Event studies of panels (c) - (f) start in 1996 when balance sheets data are available. Standard errors clustered at the local labor market level. INPS and *Cerved* data.

Figure 9: Fixed-term contracts, Age, and Experience



Notes: This figure plots coefficient and 95% confidence interval for firms in the 0-15min distance bin (red circles) and in the 15-30 min distance bin (blue triangles) of a regression based on equation (2). The dependent variable is the share of employees with a fixed-term contract in a year, age of median worker, and average experience in years. Regressions include NUTS III trends and a Bartik control for shifts in employment. Standard errors are clustered at the local labor market level. INPS data.

Table 12: Replication of Table 7 excluding workers in firms based in Milan

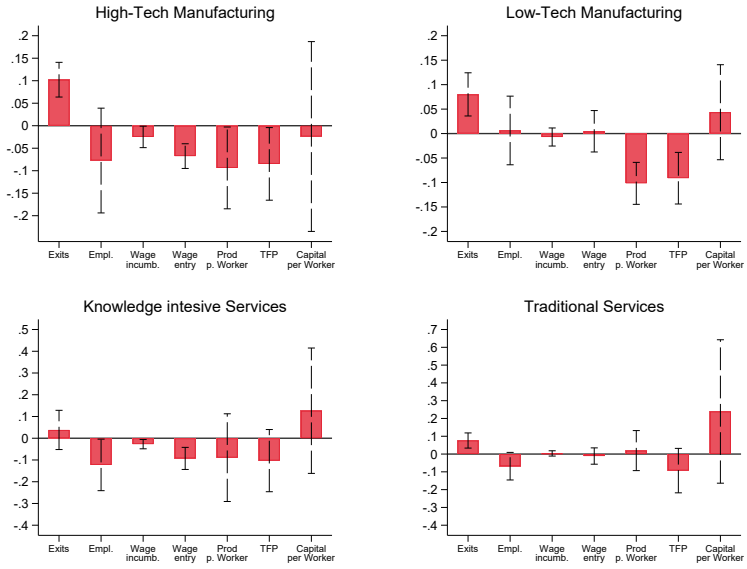
	All workers			Incumbent			Entrant			
	Log Wage (1)	Log Wage (2)	Worker AKM (3)	Log Wage (4)	Log Wage (5)	Worker AKM (6)	Log Wage (7)	Log Wage (8)	Worker AKM (9)	Share Promotions (10)
A. Treated										
Free×(d<15)	-0.014	-0.0071	0.0032	-0.013	-0.0096	0.00068	-0.029	-0.031	0.0073	0.062
	(0.0052)**	(0.011)	(0.0047)	(0.0063)*	(0.010)	(0.0036)	(0.0098)***	(0.0097)***	(0.010)	(0.020)***
B. Moderately Treated										
Free×(15 < d < 30)	0.0073	0.0078	0.0047	0.0080	0.0058	0.0021	0.0061	-0.0016	0.011	0.039
	(0.0056)	(0.0032)**	(0.0038)	(0.0034)**	(0.0029)*	(0.0031)	(0.014)	(0.012)	(0.0046)**	(0.019)**
Obs.	13,313,264	13,036,155	16,044,087	7,670,461	7,624,711	8,890,955	2,271,018	1,323,550	4,819,676	1,111,270
Firm and Time FE	X	X	X	X	X	X	X	X	X	X
Nuts III Trends	X	X	X	X	X	X	X	X	X	X
Worker FE	.	X	.	.	X	.	.	X	.	.

Table 13: Replication of Table 7 excluding government subsidies

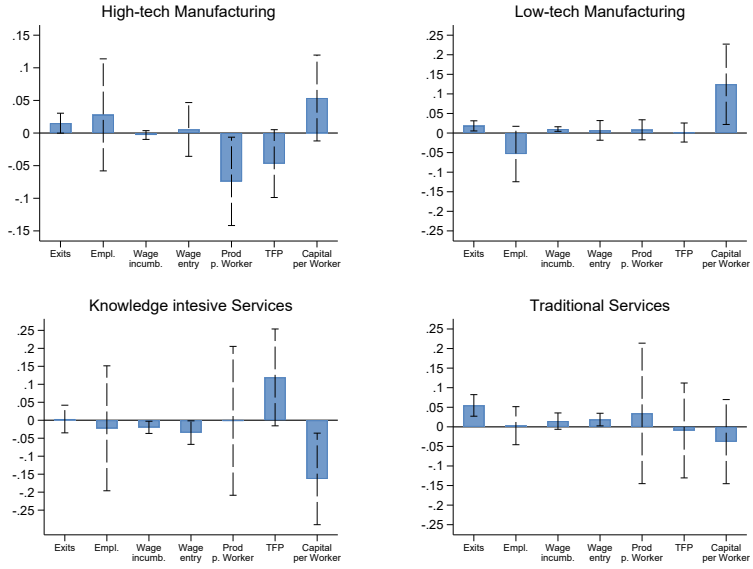
	All workers			Incumbent			Entrant			
	Log Wage (1)	Log Wage (2)	Worker AKM (3)	Log Wage (4)	Log Wage (5)	Worker AKM (6)	Log Wage (7)	Log Wage (8)	Worker AKM (9)	Share Promotions (10)
A. Treated										
Free×(d<15)	-0.013	-0.0065	0.0032	-0.0099	-0.0075	0.00067	-0.028	-0.031	0.0072	0.062
	(0.0051)**	(0.011)	(0.0047)	(0.0060)	(0.0098)	(0.0036)	(0.0096)***	(0.010)***	(0.010)	(0.020)***
B. Moderately Treated										
Free×(15 < d < 30)	0.0094	0.0092	0.0047	0.0095	0.0072	0.0021	0.0056	-0.00027	0.011	0.039
	(0.0037)**	(0.0035)**	(0.0038)	(0.0027)***	(0.0032)**	(0.0031)	(0.013)	(0.011)	(0.0046)**	(0.019)**
Obs.	19,910,143	19,207,796	21,402,922	10,801,515	10,705,914	11,801,550	4,166,428	2,409,561	6,662,065	1,111,270
Firm and Time FE	X	X	X	X	X	X	X	X	X	X
Nuts III Trends	X	X	X	X	X	X	X	X	X	X
Worker FE	.	X	.	.	X	.	.	X	.	.

Figure 10: Heterogeneity of Firm-Level Effects by Sector and Treatment Intensity

(a) Treated (0-15 min)



(b) Moderately Treated (15-30 min)



Notes: The figure plots difference-in-differences coefficients from Equation (1) for the post-2004 "Free Access" period. Panels show effects for the most treated (0-15 min from border) and moderately treated (15-30 min) regions on firm and worker outcomes across four sectors. Outcomes are worker exits, employment, incumbents and new entries wages, value added per worker, and assets per worker. Sector classification follows Eurostat's 4-digit NACE Rev. 2, here summarized by 2-digit codes: High-Tech Manufacturing (20-21, 26-30, 32-33), Knowledge-Intensive Services (50-51, 58-66, 68-75, 77-78, 80-82, 85-88, 90-91, 95), and Traditional, Non-Knowledge-Intensive Services (45-47, 49, 52, 55-56, 79, 92-94, 96). Low-Tech Manufacturing includes other manufacturing divisions (10-19, 22-25, 31) plus Utilities (35-39) and Construction (41-43), though results are robust to their exclusion. Full estimates for panel (a) are reported in Table 14, and Table 16. Estimates for panel (b) are reported in Table 15, and Table 17. Source: INPS and Cerved data

Table 14: Sector Decomposition of Firm-Level Adjustment Margins: Treated (0-15 min)

	Log Firm Size (1)	Log Wage (2)	Log Value added per capita (3)	Log Value Added (4)	TFP (5)	Log Assets per capita (6)
A. All Sectors						
Transition×(d<15)	-0.011	0.0023	-0.065	-0.069	-0.072	0.055
	(0.016)	(0.0040)	(0.041)	(0.034)*	(0.031)**	(0.050)
Free×(d<15)	-0.015	-0.014	-0.075	-0.076	-0.095	0.068
	(0.034)	(0.0054)**	(0.024)***	(0.033)**	(0.021)***	(0.021)***
B. High Tech Manufacturing						
Transition×(d<15)	-0.036	-0.0051	-0.089	-0.094	-0.081	-0.023
	(0.023)	(0.0082)	(0.022)***	(0.039)**	(0.030)**	(0.074)
Free×(d<15)	-0.077	-0.011	-0.094	-0.17	-0.085	-0.024
	(0.071)	(0.011)	(0.055)	(0.12)	(0.049)*	(0.13)
C. Low Tech Manufacturing						
Transition×(d<15)	-0.016	-0.0036	-0.091	-0.063	-0.081	0.014
	(0.023)	(0.0038)	(0.042)**	(0.068)	(0.044)*	(0.045)
Free×(d<15)	0.0063	-0.011	-0.10	-0.044	-0.091	0.044
	(0.043)	(0.011)	(0.026)***	(0.067)	(0.032)***	(0.059)
D. Knowledge Intensive Services						
Transition×(d<15)	-0.12	0.010	-0.025	-0.20	0.0023	0.21
	(0.061)*	(0.011)	(0.13)	(0.049)***	(0.072)	(0.066)***
Free×(d<15)	-0.12	-0.0047	-0.089	-0.30	-0.10	0.13
	(0.072)	(0.012)	(0.12)	(0.084)***	(0.087)	(0.18)
E. Traditional Services						
Transition×(d<15)	0.0085	0.010	-0.038	-0.083	-0.099	0.20
	(0.026)	(0.0026)***	(0.019)*	(0.065)	(0.037)**	(0.12)
Free×(d<15)	-0.068	0.0013	0.019	-0.081	-0.093	0.24
	(0.047)	(0.0080)	(0.069)	(0.095)	(0.076)	(0.25)

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). This table decomposes results from Table 6 across the industrial sector classification defined in figure 10. All regressions account for establishment fixed effects, period fixed effects, and linear trends per NUTS-III region. INPS data.

Table 15: Sector Decomposition of Firm-Level Adjustment Margins: Moderately Treated (15-30 min)

	Log Firm Size (1)	Log Wage (2)	Log Value added per capita (3)	Log Value Added (4)	TFP (5)	Log Assets per capita (6)
A. All Sectors						
Transition×(15<d<30)	-0.016	0.0047	-0.0095	-0.035	-0.0087	0.0066
	(0.013)	(0.0023)**	(0.017)	(0.022)	(0.013)	(0.024)
Free×(15<d<30)	-0.0064	0.0073	-0.0077	0.0041	-0.0033	0.069
	(0.020)	(0.0055)	(0.014)	(0.019)	(0.0096)	(0.022)***
B. High Tech Manufacturing						
Transition×(15<d<30)	0.013	0.0047	-0.015	-0.025	0.0079	-0.059
	(0.032)	(0.0027)*	(0.029)	(0.054)	(0.028)	(0.049)
Free×(15<d<30)	0.028	0.011	-0.074	-0.068	-0.047	0.054
	(0.052)	(0.0061)*	(0.041)*	(0.049)	(0.032)	(0.040)
C. Low Tech Manufacturing						
Transition×(15<d<30)	-0.047	0.0018	0.0063	-0.035	-0.0045	0.057
	(0.019)**	(0.0034)	(0.018)	(0.046)	(0.021)	(0.033)*
Free×(15<d<30)	-0.054	0.0096	0.0083	0.0079	0.0014	0.12
	(0.043)	(0.0053)*	(0.016)	(0.031)	(0.015)	(0.063)*
D. Knowledge Intensive Services						
Transition×(15<d<30)	-0.026	-0.0077	-0.15	-0.10	-0.018	-0.033
	(0.062)	(0.0083)	(0.12)	(0.062)	(0.070)	(0.057)
Free×(15<d<30)	-0.022	-0.014	-0.0016	0.0036	0.12	-0.16
	(0.11)	(0.010)	(0.13)	(0.061)	(0.082)	(0.078)**
E. Traditional Services						
Transition×(15<d<30)	0.0049	0.010	-0.023	-0.099	-0.066	-0.041
	(0.019)	(0.0038)**	(0.061)	(0.068)	(0.059)	(0.032)
Free×(15<d<30)	0.0030	0.025	0.034	-0.018	-0.0093	-0.038
	(0.030)	(0.0091)**	(0.11)	(0.070)	(0.074)	(0.066)

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). This table decomposes results from Table 6 across the industrial sector classification defined in figure 10. All regressions account for establishment fixed effects, period fixed effects, and linear trends per NUTS-III region. INPS data.

Table 16: Sector decomposition of Heterogeneity of Wages: Treated (0-15 min)

	All workers			Incumbent			Entrant				
	Log Wage (1)	Log Wage (2)	Worker AKM (3)	Log Wage (4)	Log Wage (5)	Worker AKM (6)	Log Wage (7)	Log Wage (8)	Worker AKM (9)	Share Promotions (10)	Share empl in CIG (11)
A. All Sectors											
Transition×(d<15)	0.0023	0.0017	0.0026	0.0034	0.0019	0.0023	0.0052	-0.0033	0.0041	0.018	0.46
	(0.0040)	(0.0071)	(0.0023)	(0.0049)	(0.0062)	(0.0014)	(0.0049)	(0.0060)	(0.0036)	(0.0056)***	(0.15)***
Free×(d<15)	-0.014	-0.0078	0.0032	-0.013	-0.010	0.00067	-0.028	-0.033	0.0072	0.062	0.67
	(0.0054)**	(0.011)	(0.0047)	(0.0063)*	(0.0098)	(0.0036)	(0.0100)***	(0.0099)***	(0.010)	(0.020)***	(1.08)
B. High Tech Manufacturing											
Transition×(d<15)	-0.0051	-0.012	0.0060	-0.0037	-0.015	0.0026	-0.0064	-0.015	0.012	0.0022	0.16
	(0.0082)	(0.012)	(0.0055)	(0.016)	(0.016)	(0.0038)	(0.022)	(0.017)	(0.011)	(0.0085)	(0.12)
Free×(d<15)	-0.011	-0.018	0.0091	-0.022	-0.025	0.00034	-0.082	-0.068	0.0082	0.023	0.84
	(0.011)	(0.014)	(0.0065)	(0.0097)**	(0.015)*	(0.0046)	(0.044)*	(0.017)***	(0.020)	(0.021)	(0.24)***
C. Low Tech Manufacturing											
Transition×(d<15)	-0.0036	0.00070	-0.0044	-0.00085	0.0037	-0.0046	-0.0013	-0.0052	-0.00068	0.016	1.06
	(0.0038)	(0.0042)	(0.0018)**	(0.0045)	(0.0037)	(0.0023)**	(0.011)	(0.011)	(0.0047)	(0.0029)***	(0.53)*
Free×(d<15)	-0.011	-0.0052	-0.0069	-0.013	-0.0070	-0.0071	0.015	0.0047	0.0090	0.045	1.22
	(0.011)	(0.012)	(0.0028)**	(0.0090)	(0.011)	(0.0021)***	(0.011)	(0.026)	(0.0042)**	(0.0077)***	(1.58)
D. Knowledge Intensive Services											
Transition×(d<15)	0.010	-0.0048	0.0049	0.00022	-0.0069	0.0030	0.0028	-0.066	0.0044	-0.0048	-0.0070
	(0.011)	(0.0089)	(0.0067)	(0.011)	(0.0085)	(0.0046)	(0.013)	(0.012)***	(0.0088)	(0.013)	(0.023)
Free×(d<15)	-0.0047	-0.022	0.0015	-0.024	-0.027	0.0015	-0.017	-0.093	-0.0072	0.025	0.088
	(0.012)	(0.014)	(0.0070)	(0.013)*	(0.013)**	(0.0043)	(0.021)	(0.031)***	(0.0085)	(0.065)	(0.21)
E. Traditional Services											
Transition×(d<15)	0.010	0.0066	0.0063	0.011	0.0044	0.0100	0.017	0.0077	0.00086	0.021	0.0023
	(0.0026)***	(0.0043)	(0.0025)**	(0.0030)***	(0.0048)	(0.0019)***	(0.011)	(0.013)	(0.0054)	(0.0077)**	(0.025)
Free×(d<15)	0.0013	0.0061	0.0090	0.0043	0.0035	0.0077	0.0013	-0.011	0.0048	0.045	0.35
	(0.0080)	(0.0098)	(0.0055)*	(0.0052)	(0.0091)	(0.0054)	(0.025)	(0.028)	(0.013)	(0.012)***	(0.24)
Firm and Time FE	X	X	X	X	X	X	X	X	X	X	X
Nuts III Trends	X	X	X	X	X	X	X	X	X	X	X
Worker FE	.	X	.	.	X	.	.	X	.	.	.

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table presents heterogeneity results of establishment-level DiD regressions in table 7 decomposed by industrial sector following the classification in figure 10. All regressions account for establishment fixed effects, period fixed effects, and linear trends per NUTS-III region. INPS data.

Table 17: Sector decomposition of Heterogeneity of Wages: Moderately Treated (15-30 min)

	All workers			Incumbent			Entrant				
	Log Wage (1)	Log Wage (2)	Worker AKM (3)	Log Wage (4)	Log Wage (5)	Worker AKM (6)	Log Wage (7)	Log Wage (8)	Worker AKM (9)	Share Promotions (10)	Share empl in CIG (11)
A. All Sectors											
Transition×(15<d<30)	0.0047	0.0041	0.0028	0.0044	0.0034	0.0013	0.0069	0.0074	0.0033	0.0098	0.46
	(0.0023)**	(0.0030)	(0.0027)	(0.0014)***	(0.0028)	(0.0018)	(0.0024)***	(0.0054)	(0.0030)	(0.0062)	(0.29)
Free×(15<d<30)	0.0073	0.0079	0.0047	0.0079	0.0057	0.0021	0.0061	0.0010	0.011	0.039	1.98
	(0.0055)	(0.0033)**	(0.0038)	(0.0033)**	(0.0029)*	(0.0031)	(0.014)	(0.012)	(0.0046)**	(0.019)**	(2.40)
B. High Tech Manufacturing											
Transition×(15<d<30)	0.0047	-0.0013	0.0065	0.0019	-0.0024	0.0034	0.0080	-0.00048	0.0018	-0.0048	0.22
	(0.0027)*	(0.0022)	(0.0017)***	(0.0020)	(0.0024)	(0.00094)***	(0.0046)*	(0.023)	(0.0061)	(0.0084)	(0.14)
Free×(15<d<30)	0.011	0.00021	0.0082	0.0070	-0.0030	0.0067	0.016	0.0055	0.0039	-0.0038	0.36
	(0.0061)*	(0.0043)	(0.0048)*	(0.0073)	(0.0041)	(0.0040)*	(0.0089)*	(0.025)	(0.013)	(0.017)	(0.43)
C. Low Tech Manufacturing											
Transition×(15<d<30)	0.0018	0.00076	0.00098	0.0029	0.0021	-0.00018	-0.0019	-0.0012	0.00019	0.0060	0.86
	(0.0034)	(0.0038)	(0.0026)	(0.0016)*	(0.0029)	(0.0018)	(0.0054)	(0.0067)	(0.0047)	(0.0053)	(0.49)*
Free×(15<d<30)	0.0096	0.0092	0.0026	0.012	0.010	-0.00013	0.013	0.0068	0.0052	0.023	4.00
	(0.0053)*	(0.0038)**	(0.0035)	(0.0044)**	(0.0036)***	(0.0033)	(0.0083)	(0.015)	(0.0064)	(0.014)*	(4.32)
D. Knowledge Intensive Services											
Transition×(15<d<30)	-0.0077	-0.0050	-0.0057	-0.0084	-0.0071	-0.0017	0.011	0.0041	-0.0017	0.0029	0.024
	(0.0083)	(0.0055)	(0.0045)	(0.0091)	(0.0064)	(0.0047)	(0.0082)	(0.0083)	(0.0052)	(0.0084)	(0.025)
Free×(15<d<30)	-0.014	-0.019	-0.011	-0.025	-0.020	-0.0092	0.0022	-0.034	-0.00072	0.054	-0.031
	(0.010)	(0.010)*	(0.0063)*	(0.011)**	(0.010)*	(0.0054)*	(0.021)	(0.020)*	(0.010)	(0.035)	(0.24)
E. Traditional Services											
Transition×(15<d<30)	0.010	0.015	0.0028	0.0096	0.013	0.0014	0.0081	0.014	0.0049	0.023	0.0079
	(0.0038)**	(0.0057)**	(0.0031)	(0.0056)*	(0.0067)*	(0.0040)	(0.0059)	(0.010)	(0.0044)	(0.0093)**	(0.029)
Free×(15<d<30)	0.025	0.024	0.0074	0.014	0.015	0.0030	0.037	0.019	0.020	0.063	0.063
	(0.0091)**	(0.010)**	(0.0049)	(0.0100)	(0.013)	(0.0047)	(0.020)*	(0.0098)*	(0.0054)***	(0.024)**	(0.11)
Firm and Time FE	X	X	X	X	X	X	X	X	X	X	X
Nuts III Trends	X	X	X	X	X	X	X	X	X	X	X
Worker FE	.	X	.	.	X	.	.	X	.	.	.

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table presents heterogeneity results of establishment-level DiD regressions in table 7 decomposed by industrial sector following the classification in figure 10. All regressions account for establishment fixed effects, period fixed effects, and linear trends per NUTS-III region. INPS data.

Table 18: Summary DID Table: Recruitment of workers

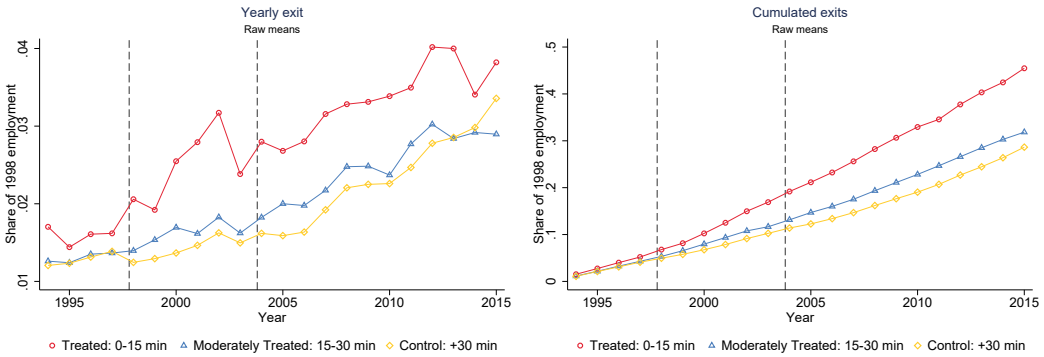
	(1) Post-Reform Control Group	(2) Post-Reform Treatment Group	(3) Post-Reform Difference (2)-(1)
Panel A: Labor force			
Weeks to find key worker	8.53	9.19	0.66
	[6.15]	[5.39]	(2.46)
Location problem in finding key worker	0.13	0.25	0.12
	[0.34]	[0.46]	(0.14)
New worker: adequate	0.77	0.64	-0.13
	[0.43]	[0.51]	(0.18)
Key worker: training days	17.5	4.97	-12.5
	[20.4]	[6.94]	(8.15)
Number of obs	91	16	107
Number of firms	57	9	66

Notes: Variable *Location problem* takes value 1 if firms report its location being an obstacle in recruiting a key worker. Variable *New worker: Adequate* takes value 1 if the firms report the newly hired key worker to be adequately suited for the job. INVIND survey data. INVIND is the annual survey on manufacturing and service firms conducted at the Bank of Italy. Surveyed firms have at least 20 employees. Given the size limit, and the specificity of my treated labor market, very few firms from this survey match with my sample. Evidence produced with this data should be taken as purely suggestive.

A.1 Robustness exercises

Figure 11: Raw means of yearly and cumulated exits

(a) Yearly (b) Cumulated



Notes: Figure plots raw means of exits for the 0-15min distance bin (red circles), the 15-30 min distance bin (blue triangles), and control group (yellow diamond).

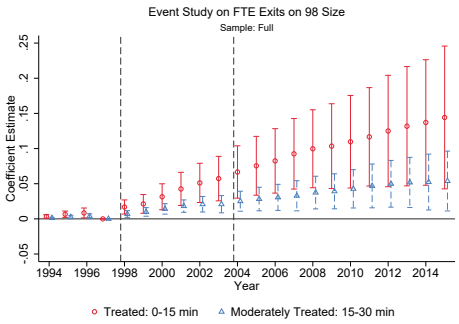
Table 19: Robustness of Exits

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Strongly Treated										
Transition×($d < 15$)	0.021	0.040	0.028	0.024	0.024	0.024	0.018	0.025		
	(0.010)**	(0.011)***	(0.0067)***	(0.0062)***	(0.0062)***	(0.0062)***	(0.0056)***	(0.0065)***		
Free×($d < 15$)	0.16	0.10	0.091	0.083	0.083	0.083	0.069	0.086		
	(0.029)***	(0.032)***	(0.025)***	(0.023)***	(0.023)***	(0.023)***	(0.022)***	(0.024)***		
Moderately Treated										
Transition×($15 < d < 30$)	-0.0022	0.016	0.013	0.0086	0.0086	0.0086	0.0076	0.0091		
	(0.0040)	(0.0045)***	(0.0034)***	(0.0028)***	(0.0028)***	(0.0028)***	(0.0036)**	(0.0031)***		
Free×($15 < d < 30$)	0.096	0.039	0.036	0.026	0.026	0.026	0.022	0.027		
	(0.014)***	(0.013)***	(0.012)***	(0.0096)**	(0.0095)**	(0.0095)**	(0.012)*	(0.010)**		
Placebo										
Transition×($30 < d < 45$)									-0.00018	0.0036
									(0.00093)	(0.0033)
Free×($30 < d < 45$)									-0.0066	-0.036
									(0.0038)*	(0.012)***
Mean y	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.08	0.10
Time FE		X	X	X	X	X	X	X	X	X
Firm FE			X	X	X	X	X	X	X	X
NUTS III				X	X	X	X	X	X	X
Bartik					X	X	X	X	X	X
Controls						X	X	X	X	X
Cerved only							X			
Milan								X		X
F-stat	73.9	154266.9	10815.4	6.12	5.22	5.22	6.12	7.20	4.43	34.1
R2	0.036	0.13	0.66	0.68	0.68	0.68	0.74	0.50	0.67	0.50
Obs.	843,440	843,440	843,287	843,287	843,287	843,287	391,900	1,111,270	653,199	921,182

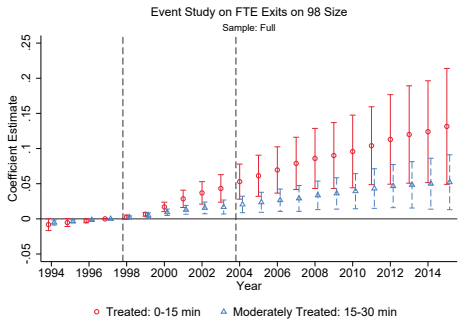
Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table presents results of establishment-level DiD regressions following equation (1). All regressions account for establishment fixed effects, period fixed effects, and linear trends per NUTS-III region. The dependent variable in is cumulated full-time equivalent (FTE) exits over total employment in 1998. Transition is a dummy equal to one between 1999 and 2003, whereas Free is one from year 2004 onward. $I(d_j \leq x)$ and $I(y < d_j \leq z)$ indicate whether a firm is located less than x travel minutes or between y and z travel minutes from the next border crossing, respectively. INPS data.

Figure 12: Robustness of Exits

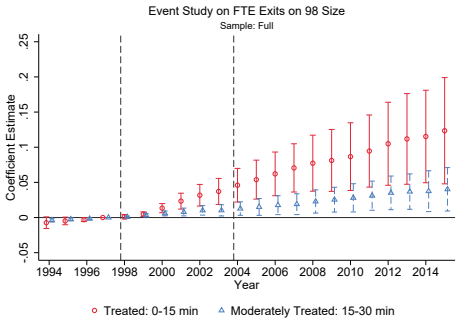
(a) No controls



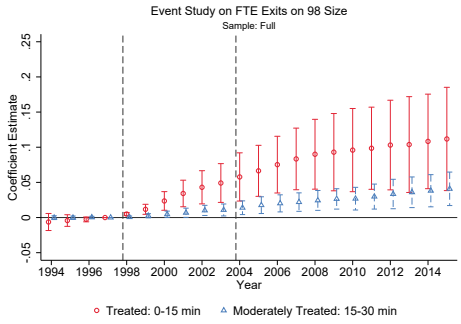
(b) Firm FE



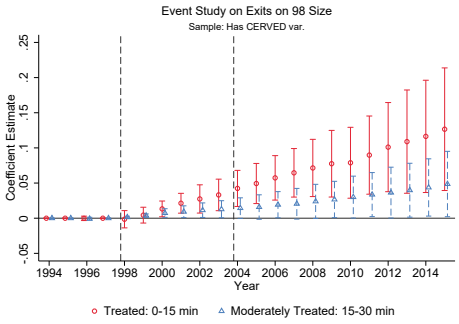
(c) NUTS III & Bartik



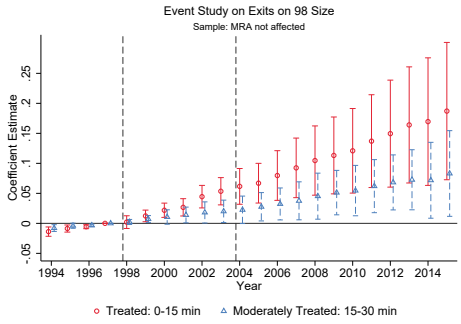
(d) Residence of median worker



(e) Cerved

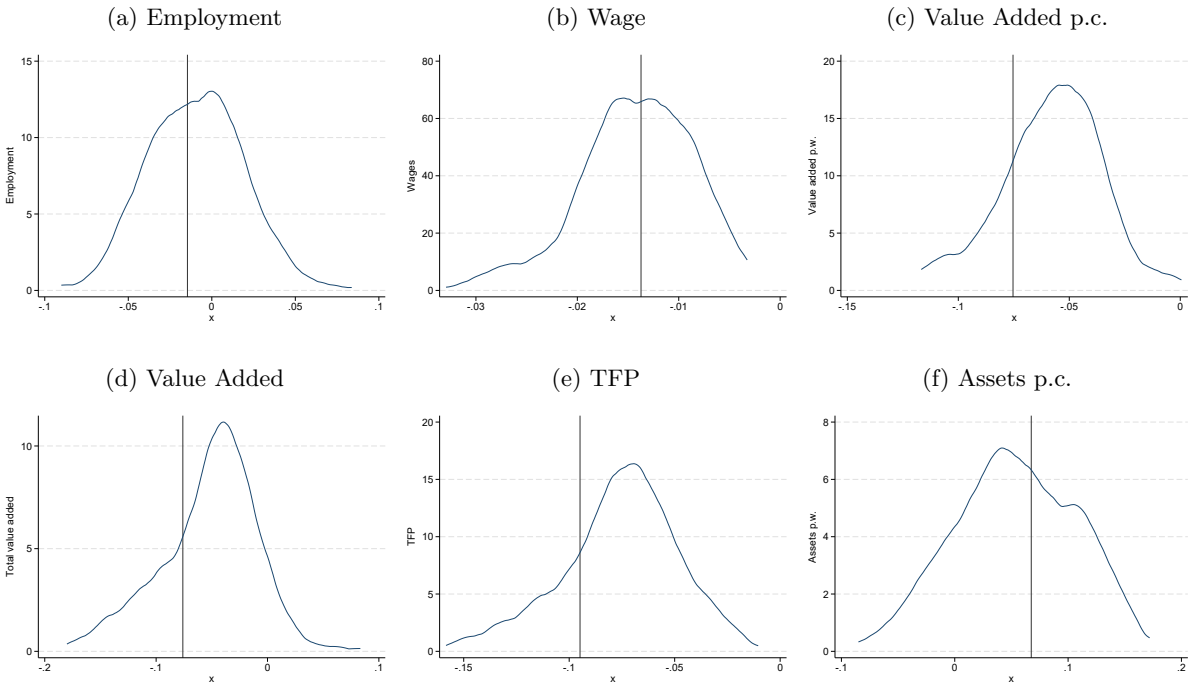


(f) Not MRA Affected



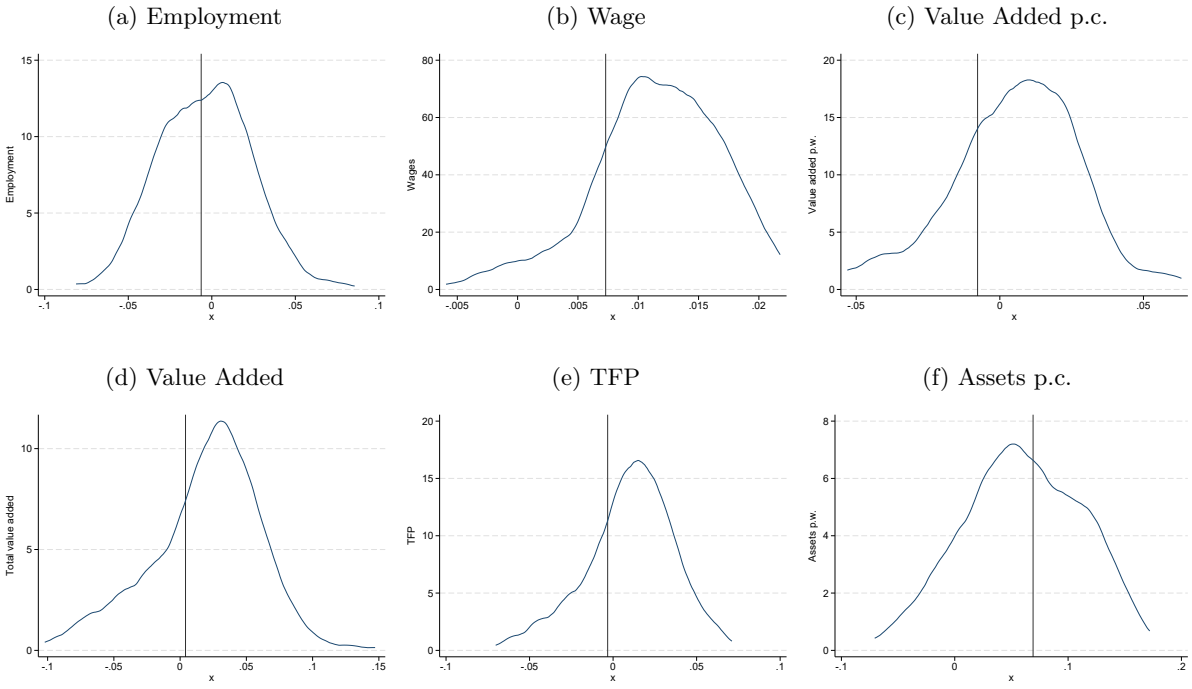
Notes: Figure plots coefficient and the 95% confidence interval for the 0-15min distance bin (red circles) and 15-30 min distance bin (blue triangles) of a regression based on equation (2). The dependent variable is cumulated full-time equivalent (FTE) exits over total employment in 1998. Panel (a) includes treatment dummies only. Panel (b) includes firm fixed effects. Panel (c) includes NUTS-III trends and a Bartik control for shifts in employment. Panel (d) locates firms using the residence of the median worker. Panel (e) restricts the sample to firms with balance sheet information. Panel (f) excludes firms affected by reductions in trade costs. Standard errors clustered at the local labor market level. INPS data.

Figure 13: Firms – Treated: Bootstrap sample



Notes: Bootstrap exercise for Table 6 panel (A).

Figure 14: Firms – Moderately Treated: Bootstrap sample



Notes: Bootstrap exercise for Table 6 panel (B).

Table 20: Margins of adjustment: Cerved firms only

	(1) Log Firm Size	(2) Log Wage	(3) Log Value added per capita	(4) Log Value Added	(5) TFP	(6) Log Assets per capita
			Panel A: Treated			
Transition×(d<15)	-0.0049	0.0081	-0.065	-0.069	-0.072	0.055
	(0.016)	(0.0051)	(0.041)	(0.034)*	(0.031)**	(0.050)
Free×(d<15)	-0.016	-0.013	-0.075	-0.076	-0.095	0.068
	(0.028)	(0.0081)	(0.024)***	(0.033)**	(0.021)***	(0.021)***
			Panel B: Moderately Treated			
Transition×(15<d<30)	-0.033	0.0071	-0.0095	-0.035	-0.0087	0.0066
	(0.020)	(0.0027)**	(0.017)	(0.022)	(0.013)	(0.024)
Free×(15<d<30)	0.0039	0.0065	-0.0077	0.0041	-0.0033	0.069
	(0.013)	(0.0056)	(0.014)	(0.019)	(0.0096)	(0.022)***
R2	0.89	0.32	0.61	0.86	0.69	0.75
F-stat	6.82	6.26	3.97	2.31	10.2	7.47
Observations	282,190	6,497,661	270,497	270,497	267,493	279,970

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table replicates results from Table 6 including only firms with balance sheet information. All regressions account for establishment fixed effects, period fixed effects, and linear trends per NUTS-III region. INPS data and *Cerved* data.

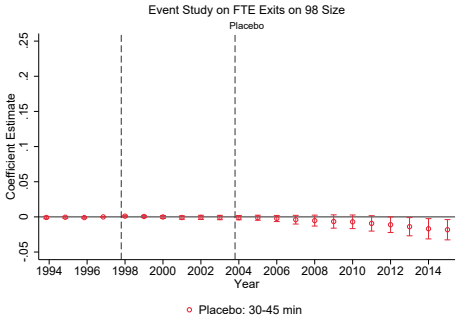
Table 21: Margins of adjustment: Including Milan

	(1) Log Firm Size	(2) Log Wage	(3) Log Value added per capita	(4) Log Value Added	(5) TFP	(6) Log Assets per capita
			Panel A: Treated			
Transition×(d<15)	-0.011	0.0023	-0.065	-0.069	-0.072	0.055
	(0.016)	(0.0040)	(0.041)	(0.034)*	(0.031)**	(0.050)
Free×(d<15)	-0.015	-0.014	-0.075	-0.076	-0.095	0.068
	(0.034)	(0.0054)**	(0.024)***	(0.033)**	(0.021)***	(0.021)***
			Panel B: Moderately Treated			
Transition×(15<d<30)	-0.016	0.0047	-0.0095	-0.035	-0.0087	0.0066
	(0.013)	(0.0023)**	(0.017)	(0.022)	(0.013)	(0.024)
Free×(15<d<30)	-0.0064	0.0073	-0.0077	0.0041	-0.0033	0.069
	(0.020)	(0.0055)	(0.014)	(0.019)	(0.0096)	(0.022)***
R2	0.87	0.43	0.62	0.86	0.71	0.76
F-stat	3.39	36.5	3.97	2.31	10.2	7.47
Observations	1,111,270	19,918,528	373,190	373,190	367,167	387,722

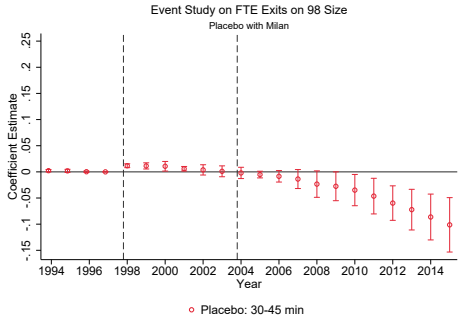
Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table replicates results from Table 6 including firms in the city of Milan. All regressions account for establishment fixed effects, period fixed effects, and linear trends per NUTS-III region. INPS data and *Cerved* data. Columns 3-4 rely on firms for which balance sheets data are available.

Figure 15: Robustness of Exits: Placebo

(a) Main placebo



(b) Including Milan



Notes: Figure plots coefficient and the 95% confidence interval for the placebo treatment 30-45min distance bin (yellow diamonds) of a regression based on equation (2). The dependent variable is cumulated full-time equivalent (FTE) exits over total employment in 1998. Panel (a) excludes firms in Milan as in the main sample. Panel (b) includes firms in Milan. Standard errors clustered at the local labor market level. INPS data.

Table 22: Margins of adjustment: Placebo

	(1) Log Firm Size	(2) Log Wage	(3) Log Value added per capita	(4) Log Value Added	(5) TFP	(6) Log Assets per capita
			Panel A: Treated			
placeboTrans	-0.032	-0.0043	0.0080	-0.0068	-0.00014	-0.0043
	(0.016)	(0.0012)**	(0.015)	(0.0071)	(0.0065)	(0.023)
placeboFree	-0.022	-0.0048	-0.013	-0.021	-0.030	0.035
	(0.024)	(0.0023)	(0.018)	(0.023)	(0.017)	(0.015)*
R2	0.87	0.40	0.60	0.86	0.70	0.75
Observations	653,199	10,584,632	220,680	220,680	218,175	228,307

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). All regressions account for establishment fixed effects, year fixed effects, and linear trends per NUTS-III region. INPS data and *Cerved* data. Columns 3-4 rely on firms for which balance sheets data are available.

Table 23: Margins of adjustment: Control goup (4-6 hours) - 4% sample

	(1) Exits Firm	(2) Log Firm Size	(3) Log Wage	(4) Log Value added per capita	(5) Log Value Added	(6) TFP	(7) Log Assets per capita
				Panel A: Treated			
Transition×(d<15)	0.013	0.088	0.0080	-0.14	-0.11	-0.17	0.087
	(0.012)	(0.10)	(0.0091)	(0.053)***	(0.085)	(0.034)***	(0.10)
Free×(d<15)	0.077	-0.020	-0.0092	-0.22	-0.23	-0.21	-0.048
	(0.034)**	(0.056)	(0.013)	(0.092)**	(0.18)	(0.082)**	(0.085)
R2	0.70	0.90	0.41	0.89	0.88	0.75	0.90
F-stat	6.92	1.56	0.41	4.02	0.92	13.7	0.60
Observations	140,201	140,201	1,493,360	50,873	50,873	50,482	52,307

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). This table relies on a 4% of firms of all sizes and replicates results from Table 6 using as control group firms in municipalities between 4 and 6 hours of commuting time to Switzerland. The moderately treated group is excluded because of multicollinearity with NUTS III trends when exluding the baseline control group. All regressions account for establishment fixed effects, year fixed effects, and linear trends per NUTS-III region. Firm level regressions are weighted using 1998 FTE employment. INPS data and *Cerved* data. Columns 3-4 rely on firms for which balance sheets data are available.

Table 24: Margins of adjustment: All sizes 4% sample

	(1) Exits Firm	(2) Log Firm Size	(3) Log Wage	(4) Log Value added per capita	(5) Log Value Added	(6) TFP	(7) Log Assets per capita
				Panel A: Treated			
Transition×(d<15)	0.010	0.055	0.00056	-0.073	0.026	-0.075	0.064
	(0.0068)	(0.021)**	(0.0082)	(0.030)**	(0.098)	(0.027)***	(0.047)
Free×(d<15)	0.065	-0.020	-0.012	-0.098	-0.11	-0.19	0.10
	(0.022)***	(0.084)	(0.012)	(0.067)	(0.16)	(0.089)**	(0.18)
				Panel B: Moderately Treated			
Transition×(15<d<30)	0.0069	-0.036	-0.0072	0.057	0.015	0.034	0.057
	(0.0041)	(0.012)***	(0.0081)	(0.041)	(0.052)	(0.054)	(0.037)
Free×(15<d<30)	0.015	-0.099	0.0083	-0.0075	-0.085	-0.069	0.081
	(0.0054)**	(0.048)**	(0.0083)	(0.055)	(0.046)*	(0.046)	(0.078)
R2	0.19	0.95	0.45	0.86	0.90	0.75	0.86
F-stat	4.75	16.7	0.81	6.84	5.03	7.78	2.83
Observations	237,501	237,501	1,296,989	76,199	76,199	75,405	78,953

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). This table relies on a 4% of firms of all sizes and replicates results from Table 6. All regressions account for establishment fixed effects, year fixed effects, and linear trends per NUTS-III region. Firm level regressions are weighted using 1998 FTE employment. INPS data and *Cerved* data. Columns 3-4 rely on firms for which balance sheets data are available.

B Reforms and Data

B.1 Labor market integration

Agreement of the Free Movement of Persons (AFMP). I briefly outline here the main features of the AFMP focusing on the peculiarities with respect to the Italian labor market. A detailed discussion of the reform is available in Beerli et al. (2021).[34] The AFMP agreement provided free worker mobility among the EU and Switzerland. It was signed in 1999, passed a national referendum in 2000, and was enacted starting in 2002. Table 25 highlights the main features of the reform. Anticipatory effects were possible from 1999, when the details of the agreement were made public. Before 1998, in the *Pre-Treatment* phase, both resident immigrants and cross border workers were subject to national quotas set by the federal government. In the *Transition* phase, starting from 1999, cantonal offices started handling job applications of cross borders in a less stringent way. Also, the previous requirement of a 6th months residence in a bordering region in Italy was no longer necessary. Cross border workers permits' duration was extended to 5 year in 2002. Before than, the maximum duration was one year and the permit was tied to a specific job. Finally, weekly instead of daily commuting was allowed.[35] In 2004 the agreement was fully implemented starting the *Free access* phase with the abolition of the so called "priority requirement". In practice, Swiss employers where no longer required to prove they could not find an equally suitable Swiss worker to fill their vacancy. Also, cross borders were granted access to every Swiss region, and not just the bordering ones. The requirements for permanent resident immigrants did not change much around these dates. Higher quotas were implemented, but the labor market for resident immigrants was fully liberalized in 2007.

Table 25: Implementation timeline of the AFMP

Phase	Year	Event	Rules	
			CBW	Resident Immigrants
Pre-Treatment	Pre 1998			Full Restrictions
	1998	Agreement announced	Full Restrictions	
Transition	1999	Agreement signed	More "relaxed" handling of permit applications	
	2000	Referendum	CBW permit duration 1 year - stops with contract	
			No requirem. of 6 months residence in border region	
	2002	Agreement enacted	CBW permit duration 5 years	Higher quotas
			Weekly commuting	
Full Liberalization	2004	First liberalization	No priority requirement.	Abolition admission process
	2007	Free access	Full access to all regions	No restrictions
	2008	Schengen area	No controls at the border	

Notes: Table adapted from (Beerli and Peri, 2015)

[34] And also extensively in Ruffner and Siegenthaler (2017).

[35] Though the vast majority of cross borders was still commuting every day (Beerli and Peri, 2015).

Other agreements. The signing of the AFMP was part of a bundle of agreements between Switzerland and the EU which were all ratified around 2002. Table 26 provides an overview of these agreements.[36] I briefly summarize here the most relevant implications for my setting. The most relevant agreements where the Mutual Recognition Agreement (MRA) and the Land Traffic Agreement (LTA). The first one introduced lower administrative costs for approving products of specific manufacturing sectors. This basically increased the volume of trade between EU, and therefore Italy, and Switzerland; while it is surely possible that this reform might confound the main effect of enacting the AFMP, I can rule this out focusing on industries which were not included in this agreement. The LTA instead, increased the higher weight limit that was allowed to be transported in Switzerland. The Swiss statistical office estimated an accumulated reduction in costs of around 8.3% which is unlikely to confound my estimates. Also in this case it is possible for me to exclude tradable industries from my estimates. Finally, the public procurement agreement's effect in my setting are quite unknown and difficult to estimate. However, given the peculiarity of such kind of contracts, is it reasonable to assume they are not the main driver of my results. I did not report the agreement on agricultural sector as I exclude that sector from my analysis, and the agreement on research cooperation which does not affect private sector firms.

The Italian Labor Market. According to the Italian legislation wages are set at two levels. First, at a national-industry level, and second, at a company level. Such regulations in the labor market have been constant throughout the analysis period. From 2011 some regulation have been implemented to support company bargaining. Anyway companies are not allowed to set wages at a lower level than the national bargained one. Though these reforms aimed at supporting company bargaining, the vast majority of Italian contracts still follows the nationwide industry-level agreements. Also, the main regulations on employment protection and social security did not have major changes from 1993 up to 2010. In 2012 new social security measures where introduced to help workers who lost their jobs due to the crisis also limiting the use of fixed-term contracts. In 2015 the so called "jobs act" introduced more flexibility in the labor market. All of these measures where uniform across the whole Italian labor market. Some of them were more generous for workers and firms in the south, but they all uniformly affected the firms and workers in my sample.

[36] An extensive discussion of these reforms and their effects can be found in Hafner and Hedtrich (2024) and Beerli et al. (2021)

B.2 Data sources and construction

The following paragraphs features an overview of all the data sets and describe the construction of variables. INPS data have been available through the VisitInps Scholar type B program.

a) INPS Data: Workers. Italian Social Security data provides individual workers' contribution histories for the universe of Italian private sector's employees. The data are reported from employers who provide the institute with information about their employees when paying mandatory contributions of their workers. The relevant data set is *rapporti di lavoro annuali*. This is a yearly panel where each worker has a record for each employment relationship in that year. For each record, the following information is available. Employer's id, start of contract, end of contract*, reason for termination*, part-time employment, share of part-time work, number of total weeks worked, number of actual weeks paid, gross income for contribution basis, extra income not subject to contributions*, months of employment, qualification, municipality of work*.[37] This information is coupled with time invariant demographics available in *anagrafica*: municipality of last residence and birth, gender, date of death, date of retirement, citizenship.

- *Sample restrictions*: I keep all workers aged between 16 and 65 with at least one employment spell between 1994 and 2015.
- *Full time equivalent employment*: I use the part-time share to define full time equivalent employment. Therefore, an employee who works at 80% accounts for 0.8 workers. Alternatively, I assign every part-time worker a share of 50%, or I define the dimension of the firm using the number of employees reported by the employer. These numbers are all very similar and do not change my results. I measure employment in weeks, as this is the most reliable information available. Months are flagged as well, but a full month is flagged even for one week of work. The information on days is not as reliable either, as it includes extra days paid but not actually worked. Weeks instead are already reported in terms of weeks at work and weeks paid, already accounting for the share of part time work.
- *Weekly wages*: wages are reported as yearly income. I use both the contribution basis and the total income including transfers and additional payments. I deflate them using the consumer price index at 2015 constant prices. I then divide these two measure by the number of weeks paid to get the amount of real weekly wages. I winsor wages at 0.05 and 99.5 percentile.

[37] * Available form 2005

- *Employment transitions*: From the yearly panel, I flag as hiring the first spell at a new employer during the employee's history. In the same spirit, I define the last spell as a separation. I flag a separation as a job to job transition any time I observe the worker at a new employer in the same year or the year afterwards. I flag as promotion any time I observe two identical records for the same worker at the same employer but with a higher qualification.

- *Exit from INPS data*: I flag as *exit* from INPS data any separation of workers where I do not observe a pension spell or a death. This "exit" could be because of a worker moving to the public sector, to self-employment, becoming an external collaborator, or leaving Italy. Using a sample of public sector employees and self employed workers, I shut down the *exit* label any time I observe a worker in one of these samples. However, becoming a self employed or an external collaborator does not rule out by definition the possibility that the worker moved abroad. Therefore, my estimate of individuals moving abroad is likely to be conservative.

- *Distance to the border*: I match each municipality of residence and work with the distance data set using *codice catastale*. I assign to each worker the driving, time, and air distance from it's residence and job municipality to the closest Swiss border crossing.

b) INPS Data: Firms. The relevant firm datasets for firms are *aziende annuali* and *anagrafica aziende*. From these I build a yearly panel of establishments featuring information on firm id, group id, legal type of firm, date of opening and closure, reason for closure, 4 digit NACE sector, number of employees, full amount of wages paid to all employees and managers, firm municipality.

- *Size requirement*: I restrict the sample to firms that are always smaller than 3 FTE employees or bigger than 250 FTE employees. This cuts roughly 50% of firms on the left tail and fewer than 0.5% on the right one. The main sample consist of firms with at least 3 FTE employees within one year, who are active in 1998.

- *Border assignment*: I merge the municipality of the firm with my distances data set. Then I exclude firms further away then 75 minutes or 75 km driving distance from the Swiss border. This excludes now 90% of observations

- *Firms and workers in Milan*: I exclude all firms in Milan, all firms in Campione d'Italia, and all firms where the entire labor force lives in Milan. This is the case for some firms whose legal headquarter is placed outside of Milan, but the actual establishments are in Milan. Also,

Milan has a way more mobile labor market, and it is located at 50 minutes from the border. Milan would therefore be assigned to the control group. However, looking at the pattern of *exits*, Milan is clearly an outlier with more than 80'000 workers disappearing from social security data over 10 years. This excludes 93.5% of observations.

- *Sectors*: I exclude firms with missing sector and firms operating in agriculture, in the public sector, and international organizations. Also, I drop firms owned by public institutions, by the church, or by political parties excluding now 94.1% of the sample

Eligible firms for my analysis represent 5.8% the total Italian employment in the period of the analysis. Table 27 offers an overview of the characteristics of Italian firms compared to my sample. Overall, more than 853'000 firms have at least 3 FTE employees in one year and are active between 1994 and 2015. Column (1) shows all firms. Column (4) includes all Italian firms who reached a size of 3 FTE employees. Column (3) and (4) divide them between eligible and not eligible firms for my sample. The average Italian firm has 10.6 FTE employees, while the average firm in my sample has 14.3 FTE employees. Firms in my final sample hire 3.6 new employees per year in line with the Italian average. They have a lower share of part-time workers, and a similar share of blue collar workers. The average firm in my sample has been active for 13 years (longer than the national average). Italy has a relatively high share of Manufacturing at 20% of value added (OECD 15%, US 16.4%). Firms in manufacturing represent 60% of the final sample.

c) Cerved Data. Cerved data provide balance sheets' information for Italian incorporated firms. Data are available from 1996 to 2016. The variables are merged at the firm level. 95% of firms have a single establishment in one year. Firms with multiple establishments over the analysis period are excluded from the analysis of firms' outcomes. I use the following variables: value of tangible assets, value of intangible assets, depreciation, value added, value of production, revenues, profits, total assets, and labor costs. Employment is merged directly form the INPS data. I therefore compute labor productivity as value added per employee and total factor productivity following Wooldridge (2009) and Levinsohn and Petrin (2003). All nominal values are deflated using sector specific GDP deflators to 2015 values.

Swiss Data. Swiss Social Security data are provided by the Swiss Statistical Office. Like in the INPS data, I am able to observe complete workers' history and demographics characteristics of Swiss workers. I mostly rely on ZEMIS, a data set containing employment spells of immigrants working in Switzerland. I exploit the nationality of immigrants and their resident permit. In particular, I can

Table 26: Agreements between Switzerland and the EU

Agreement	Description	Effect
Free Movement of Persons	Free access to labor market	Expansion of local labor markets
Mutual Recognition	lower administrative costs for approval of products for some manufacturing sectors	Cost savings of 0.5 –1 % of product value per year. Corresponds to less than 0.2% of trade volume between EU and Switzerland. Increased mostly imports to Switzerland at the intensive margin
Land Traffic	Higher weight limit on carriages, tax on alp-crossing transport	By 2006, accumulated reduction in cost for transports between Switzerland and EU of 8.3%
Air Traffic	More competitive pressure for air-lines	More and cheaper connections from Geneva Airport
Public Procurement	Swiss purchasers (municipalities, utilities, rail, airports, local traffic) need to tender internationally	Unknown (10% of bidders for municipal purchases were foreign)

Table 27: Characteristics of Italian firms vs. working sample

	(1) All Firms 1998 All sizes	(2) All firms 1998 3-250	(3) Not Eligible 1998 3-250	(4) Final Sample 1998 3-250
Firm				
FTE Employees	10.6	13.0	12.9	14.3
	[102.9]	[21.4]	[21.1]	[23.5]
Number of New Workers	3.60	4.32	4.40	3.61
	[92.7]	[9.70]	[9.73]	[9.47]
Share of Part-Time Workers	0.13	0.094	0.095	0.080
Share of Blue Collars	0.70	0.71	0.71	0.67
Firm Age in 1998	10.9	11.8	11.6	12.9
	[9.28]	[9.43]	[9.39]	[9.74]
Primary Sector	0.011	0.012	0.013	0
Secondary Sector (Manufacturing)	0.30	0.35	0.34	0.60
Tertiary Sector (Service)	0.69	0.64	0.65	0.40
Eligible Firm	0.065	0.097	0	1
Number of obs	853,262	570,332	514,811	55,521

Notes: Average characteristics of Italian firms. Column (1) averages across all Italian firms in 1998. Column (2) restricts to firms between 3 and 250 FTE employees. Column (3) and (4) splits firms in column (2) into firms not eligible (3) and eligible (4) for my analysis. INPS data.

distinguish between resident immigrants and cross border workers. For the latter category, I have information on the municipality of residence in the country of origin. I couple this information with my Italian data. Yearly information on immigrants is available from 2003. From that year on I can observe every immigrant's spell. For the previous years however, I have information on cross border workers who keep working until 2003. This means that, for the early years in my analysis I only observe a subset of long term cross border workers. C describes the Swiss data set and summarizes characteristics of Italian cross borders in Switzerland

C Characteristics of Italian Cross Border Workers

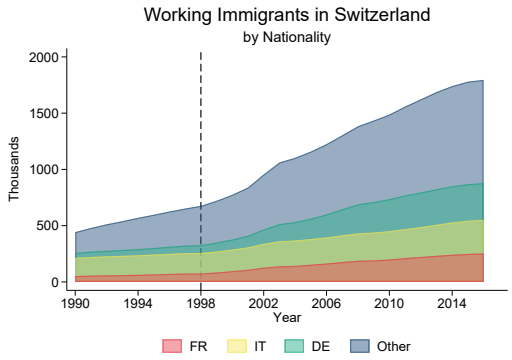
While CBWs and RI both generate a negative labor supply shock and make the labor market tighter for substitutable workers, the latter ones change their residence, meaning they are less likely to generate positive demand spillovers on their communities of origin. In this section I summarize facts and characteristics of these two groups. Italians are the second largest group of working immigrants in Switzerland as shown in figure 16a. More than 300'000 Italians currently work in Switzerland, and almost one third of them does so as a cross border worker. The total number has been constantly increasing since 1990, when Italians working in Switzerland were around 150'000. The biggest immigration inflow of residents and cross borders took place after 2000, 2004, and 2007, in line with the liberalization process of the market access. This is shown in figure 16c.[38] Figure 16d decomposes the inflow of cross borders into high versus low skilled occupations. The number of cross borders increased from 20'000 to almost 80'000 in 25 years. Among them, the number of low skilled workers had almost a fourfold increase from 18'000 in 1990 to 56'000. The number of cross borders in a high skilled occupation instead, increased more than 10 times: from 2'000 to 24'000 today.

Table 28 reports summary characteristics of Italian workers in Switzerland as observed in their first employment spell (except wage and number of spells, which are averages of their employment history in Switzerland). Cross borders are almost ten years younger than resident immigrants. The average cross border has been employed for 14 years, 10 years less than the average resident immigrant. Women represent 38% of all workers. Resident immigrants are more likely to work in a skilled occupation or in a skilled sector. While 92% of cross borders works in Ticino (and 99% of them in a bordering canton) only 21% of Residents work in the same bordering regions. Jobs in

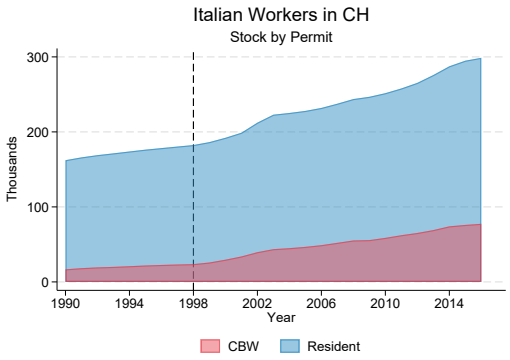
[38] The figure shows a spike in 2003, this is because, for the flows before that date, I have only data on workers who are still employed in Switzerland in 2003. One can nevertheless see the increase in the number of stayers after 1998.

Figure 16: Characteristics of working immigrants in Switzerland

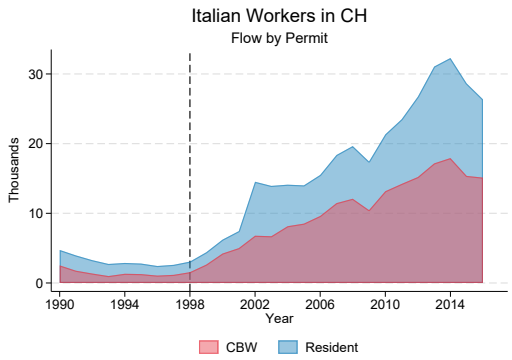
(a) Workers by Nationality



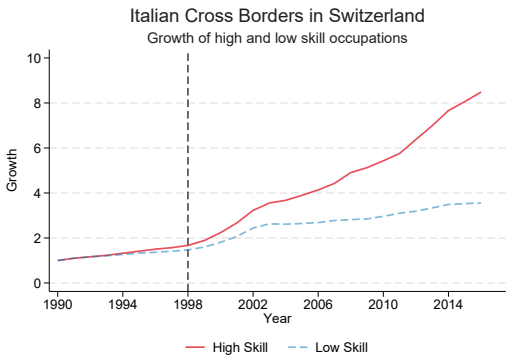
(b) Stock of RI and CBW



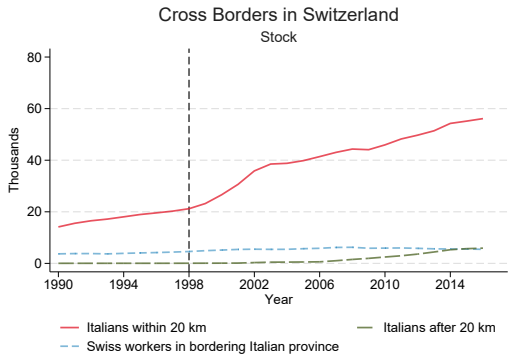
(c) Flow of RI and CBW



(d) High vs. Low Skilled



(e) Tax exemption



Notes: Panel (a) stock of immigrants in Switzerland by nationality. Panel (b) stock of Italians in Switzerland by resident permit (Resident immigrant or cross border worker). Panel (c) flow of Italians by resident permit. Panel (d) relative increase of cross border workers in high vs. low skilled occupations. High skill occupations are managers, scientific occupations, and technical occupations ISCO code 1, 2, and 3. Panel (e) divides cross border workers between residents within 20km (eligible for personal income tax exemption) and those outside. All data are from own calculations based on ZEMIS data.

Switzerland are quite stable for Italians, and the average worker changes fewer than two employers while working in Switzerland. The average wage of a cross border is 4'200 Swiss francs. Residents are slightly better paid with an average wage of 4'850 Swiss francs. High skill occupations offer, on average, much higher salaries (around 6'000 for cross borders and 8'000 for residents) than low skilled occupations (3'800 for cross borders and 4'800 for residents). The average cross border lives 17 minutes away to the nearest border crossing. The vast majority of cross borders (79%) lives within 30 minutes to the border, and 88% of them lives within 30 kilometers to the border. Figure 17 ranks municipalities on the x axis, according to their driving distance to the Swiss border in five minutes bins. Panel (a) shows the number of cross border and expat workers as share of 1991 population in each municipality bin, panel (b) and (c) show decompose this figure between cross borders and resident immigrants, whole panel (d) shows the absolute number of cross borders. Each line is for a different sample year from 1994 to 2016.[39]

According to the graphs, in municipalities within 15 minutes of commuting time to Switzerland, 3 to 15% of the population works as cross borders. This number floats around 1 and 3% for municipalities between 15 and 30 minutes of driving time to Switzerland. The share of the population working as cross border in municipalities further away than 30 minutes is instead indistinguishable from zero.[40]

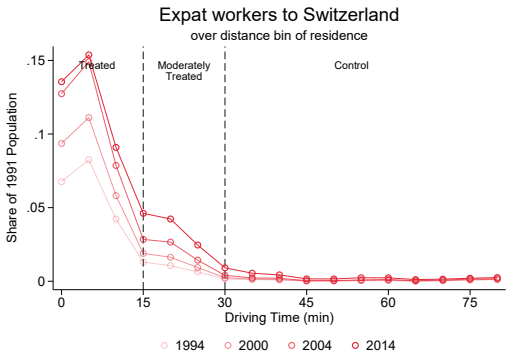
Figure 18 displays the share of cross borders in each municipality bin, together with average characteristics of workers in each bin. Each panel shows there is no particular selection of immigrants across distance bins in terms of age, gender, occupation, sector, place of work, and average wages.

[39]The time horizon differs based on the availability of the data.

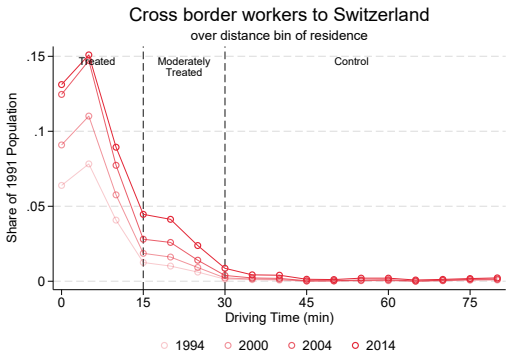
[40]It would be more appropriate to show the number of cross borders as share of the labor force in the same municipalities. However, as residence is not time variant in the Italian data, I cannot construct a consistent picture over time. When I measure cross borders as share of the labor force in 2017 (the only year for which residence information is available, I find that cross borders can peak to 60% of the Italian labor force in treated municipalities. The same number is around 10% in moderately treated municipalities, and again zero for municipalities in the control group.

Figure 17: Expat workers by distance bin of the municipality of residence

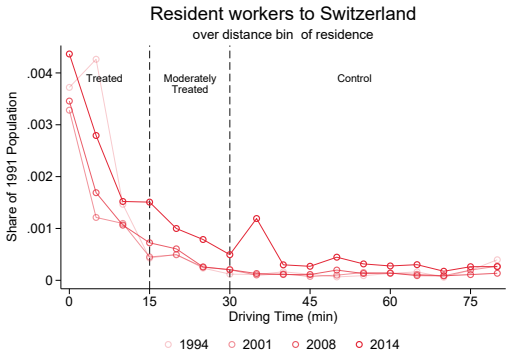
(a) Expat workers



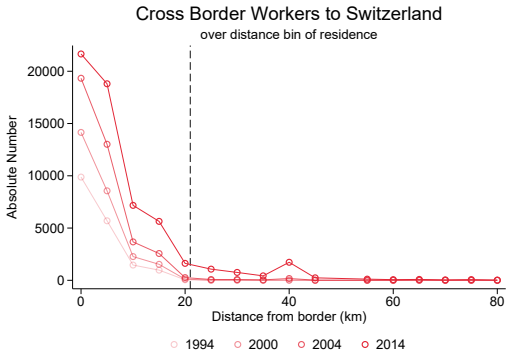
(b) Cross borders



(c) Resident immigrants



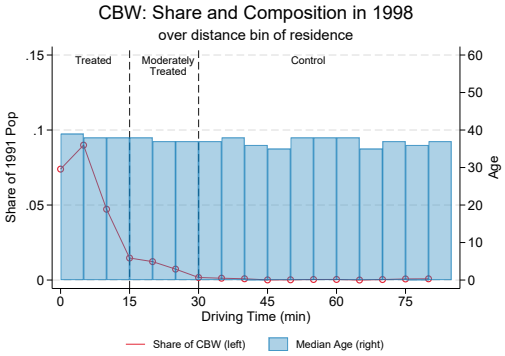
(d) Cross borders: absolute



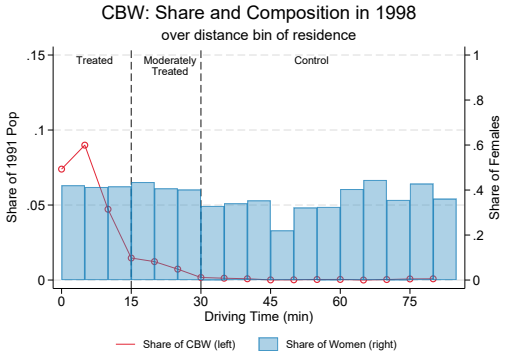
Notes: Expat workers per municipality. Municipalities are ranked on the x axis according to the driving distance to the Swiss border and grouped within five minutes bins. Panel (a) shows the number of expat workers as share of 1991 population in the municipalities. Panel (b) shows the share of cross borders and pane (c) the share of residents. Panel (d) shows the absolute number of cross borders. Each line is for a different sample year from 1994 to 2014-2016.

Figure 18: Share of cross borders on Italian population by distance bin

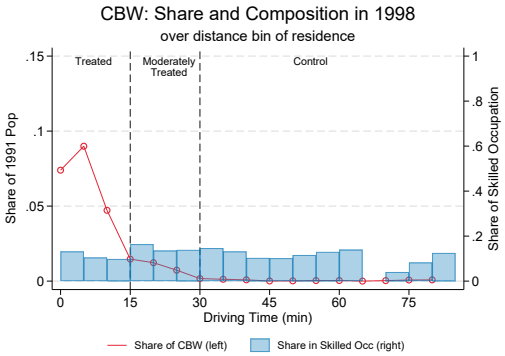
(a) Age



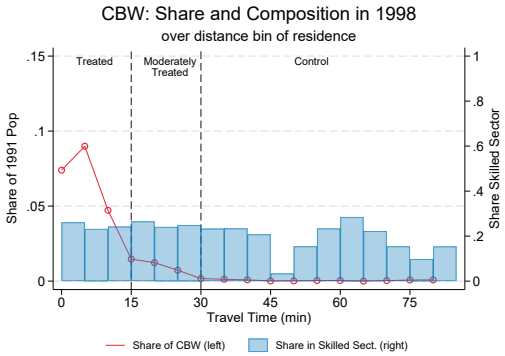
(b) Women



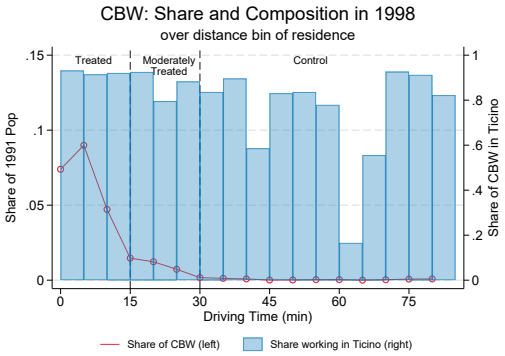
(c) High skilled occup.



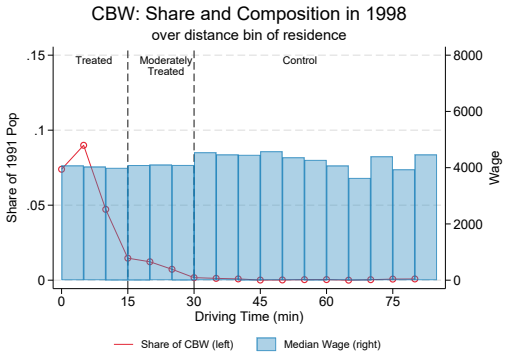
(d) High skilled sect.



(e) Works in Ticino



(f) Average wages



Notes: This figure shows again the share of Cross Border Workers per municipality on population in 1991. Each panel adds a different characteristic of cross borders in each distance bin. Panel (a) shows average age, panel (b) gender, panel (c) share of workers in a high skill occupation, panel (d) share of workers in a high skilled sector, panel (e) share of workers in Ticino, and panel (f) average wages.

Table 28: Italians working in CH

	(1) Full	(2) CBW	(3) RI
Panel A: Worker Characteristics			
Age	46.2	38.9	47.9
	[14.2]	[10.7]	[14.4]
Female	0.38	0.38	0.38
Years since in CH	21.4	13.9	23.1
	[7.63]	[8.32]	[6.29]
Panel B: Job Characteristics			
Skilled occupation	0.24	0.21	0.26
High skill intensive sector	0.29	0.28	0.35
Works in Ticino	0.25	0.92	0.16
Works in bordering canton	0.31	0.99	0.21
Job spells	1.21	1.79	1.07
	[0.96]	[1.64]	[0.64]
Job duration (months)	424.3	157.8	487.1
	[227.2]	[122.7]	[198.8]
Wage (thousands)	4.72	4.20	4.85
	[4.88]	[3.65]	[5.13]
Wage high skilled (thousands)	7.33	6.03	8.13
	[11.3]	[7.44]	[13.1]
Wage low skilled (thousands)	4.30	3.85	4.68
	[2.33]	[1.92]	[2.57]
Panel C: Commuting Distance			
Km distance to CH border	-	17.0	-
		[19.3]	
Time distance to CH border (min)	-	24.7	-
		[24.5]	
Lives within 30 driving min to border	-	0.79	-
Lives within 30 driving km to border	-	0.88	-
Number of spells	5,898,061	1,125,973	4,772,088
Number of workers	419,077	146,016	273,061

Notes: Average characteristics of Italian immigrants working in Switzerland by resident permit. Column (1) includes all Italian workers. Column (2) refers to Cross Border Workers, and column (3) to Resident Immigrants for completeness. Panel A and B display demographics and job characteristics. Panel C shows information about cross borders' commuting on which I leverage for my analysis. Characteristics are averaged across all individuals who have ever worked in Switzerland at the time of their first employment spell. Swiss Social Security data.

D Supporting Material

Table 29: The Effect of Labor Market Integration on Worker Exits by Wage Quartile - Incorporated firms

	(1) Exits	(2) Exits Bottom Quartile	(3) Exits Lower Mid Quartile	(4) Exits Upper Mid Quartile	(5) Exits Top Quartile
			Panel A: Treated (0-15 min)		
Transition×(d<15)	0.018	0.0025	0.0034	0.0072	0.0056
	(0.0054)***	(0.0027)	(0.0013)**	(0.0013)***	(0.0024)**
Free×(d<15)	0.068	0.016	0.014	0.023	0.022
	(0.022)***	(0.0094)*	(0.0032)***	(0.0053)***	(0.0081)**
Relative Effect	1.61	1.07	1.39	2.25	1.95
			Panel B: Moderately Treated (15-30 min)		
Transition×(15<d<30)	0.0073	0.0033	0.0013	0.0018	0.0016
	(0.0034)**	(0.0012)**	(0.00090)	(0.00087)**	(0.0012)
Free×(15<d<30)	0.022	0.0087	0.0041	0.0078	0.0058
	(0.011)*	(0.0054)	(0.0022)*	(0.0029)**	(0.0044)
Relative Effect	0.52	0.56	0.42	0.77	0.51
Mean of Dep. Var.	**0.042**	**0.015**	**0.0098**	**0.010**	**0.011**
Firm FE	X	X	X	X	X
Time FE	X	X	X	X	X
Nuts III trend	X	X	X	X	X
R2	0.71	0.64	0.73	0.73	0.66
F-stat	5.43	3.32	6.46	36.1	3.45
Observations	282,190	282,190	282,190	282,190	282,190

Notes: The table presents difference-in-differences estimates from Equation (1) replicating Table 3 for the sample of incorporated firms. Standard errors, clustered by local labor market, are in parentheses (* p<0.01, ** p<0.05, *** p<0.01). Source: INPS data.

Table 30: Firm Entry and Exit: Moderately Treated (15-30 min)

	(1) Full	(2) High Tech Manufacturing	(3) Knowledge Intensive Services	(4) Low Tech Manufacturing	(5) Not Knowledge Intensive Services
			Panel A: Firm Entry		
Transition×(15<d<30)	-0.0022	-0.0044	0.0034	-0.0032	0.0018
	(0.014)	(0.0067)	(0.0050)	(0.0082)	(0.0062)
Free×(15<d<30)	-0.023	-0.0093	0.0065	-0.021	0.00063
	(0.024)	(0.017)	(0.011)	(0.019)	(0.017)
Mean of Dep. Var.	**0.30**	**0.069**	**0.031**	**0.12**	**0.079**
			Panel B: Firm Exit		
Transition×(15<d<30)	0.0083	0.0012	0.0020	-0.0058	0.011
	(0.016)	(0.0060)	(0.0040)	(0.0100)	(0.0083)
Free×(15<d<30)	-0.0026	-0.0042	0.0036	-0.023	0.021
	(0.034)	(0.019)	(0.011)	(0.024)	(0.022)
Mean of Dep. Var.	**0.20**	**0.044**	**0.013**	**0.098**	**0.045**
Firm FE	X	X	X	X	X
Time FE	X	X	X	X	X
Nuts III trend	X	X	X	X	X
Observations	13,762	13,762	13,762	13,762	13,762

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table presents results of municipality-level DiD regressions following equation (1). All regressions account for period fixed effects, and linear trends per NUTS-III region. The dependent variable in panel A is cumulated entry of firms and the dependent variable in panel B is cumulated exits, both as share of total number of firms in a municipality in 1998. Regression are weighted using the total number of firms in a municipality. Column (1) reports the results from the full sample in Table 3. Columns (2)-(5) report the effects disaggregated by industrial sector as defined in Figure 10.

Table 31: Exits by Qualification - Incorporated Treated firms (0-15 min)

	Exits	Exits Top Managers	Exits Managers	Exits White collars	Exits Blue collars	Exits Apprentices
	(1)	(2)	(3)	(4)	(5)	(6)
A. All Sectors						
Transition×(d<15)	0.018	-0.0082	0.0024	0.79	0.97	0.029
	(0.0054)***	(0.0050)	(0.0022)	(0.63)	(0.21)***	(0.014)**
Free×(d<15)	0.068	-0.022	0.0050	2.74	2.70	0.055
	(0.022)***	(0.0076)***	(0.0040)	(1.98)	(0.47)***	(0.065)
B. High Tech Manufacturing						
Transition×(d<15)	0.024	-0.017	0.00086	0.60	1.65	0.013
	(0.0067)***	(0.013)	(0.0036)	(0.28)**	(0.90)*	(0.022)
Free×(d<15)	0.082	0.032	0.0034	2.67	3.35	0.042
	(0.026)***	(0.032)	(0.0069)	(1.29)*	(1.71)*	(0.047)
C. Low Tech Manufacturing						
Transition×(d<15)	0.018	-0.0072	0.00077	0.31	1.12	0.057
	(0.0046)***	(0.0068)	(0.00074)	(0.11)**	(0.18)***	(0.034)
Free×(d<15)	0.053	-0.027	0.0030	1.08	3.72	0.082
	(0.015)***	(0.0055)***	(0.0014)**	(0.32)***	(0.79)***	(0.092)
D. Knowledge Intensive Services						
Transition×(d<15)	0.0043	-0.013	-0.0028	1.70	1.58	-0.024
	(0.028)	(0.0069)*	(0.0054)	(6.11)	(0.96)	(0.028)
Free×(d<15)	0.072	-0.051	-0.022	8.94	4.84	-0.023
	(0.10)	(0.042)	(0.013)	(18.2)	(2.71)*	(0.040)
E. Traditional Services						
Transition×(d<15)	0.013	0.0034	0.0037	0.71	0.48	0.022
	(0.0054)**	(0.0027)	(0.0017)**	(0.32)**	(0.56)	(0.012)*
Free×(d<15)	0.055	-0.021	0.0014	1.20	0.41	0.075
	(0.022)**	(0.015)	(0.0032)	(0.93)	(1.43)	(0.084)
Firm and Time FE	X	X	X	X	X	X
Nuts III Trends	X	X	X	X	X	X

Notes: The table presents difference-in-differences estimates from Equation (1). This table decomposes the exits b qualification for incorporated firms only. All regressions include establishment and period fixed effects, as well as NUTS-III region linear time trends. Standard errors, clustered by local labor market, are in parentheses (* p<0.01, ** p<0.05, *** p<0.01). Source: INPS data.

Table 32: Exits by Qualification - Incorporated Moderately Treated firms (15-30 min)

	Exits	Exits Top Managers	Exits Managers	Exits White collars	Exits Blue collars	Exits Apprentices
	(1)	(2)	(3)	(4)	(5)	(6)
A. All Sectors						
Transition×(15<d<30)	0.0073	-0.00054	0.0018	0.052	0.44	0.013
	(0.0034)*	(0.0059)	(0.00077)*	(0.21)	(0.16)*	(0.012)
Free×(15<d<30)	0.022	-0.014	0.0052	0.12	1.08	0.025
	(0.011)	(0.0082)	(0.0025)*	(0.51)	(0.65)	(0.027)
B. High Tech Manufacturing						
Transition×(15<d<30)	0.0041	0.0071	0.0012	0.066	0.49	0.014
	(0.0028)	(0.0094)	(0.0015)	(0.090)	(0.22)*	(0.011)
Free×(15<d<30)	0.0099	-0.017	0.0033	0.11	0.88	0.019
	(0.0080)	(0.012)	(0.0030)	(0.24)	(0.64)	(0.022)
C. Low Tech Manufacturing						
Transition×(15<d<30)	0.0055	-0.0019	0.000011	0.0095	0.068	0.0039
	(0.0026)*	(0.0082)	(0.00052)	(0.063)	(0.12)	(0.0100)
Free×(15<d<30)	0.017	0.0049	0.0022	0.20	-0.15	-0.00054
	(0.0078)*	(0.0075)	(0.00079)**	(0.12)	(0.42)	(0.036)
D. Knowledge Intensive Services						
Transition×(15<d<30)	-0.0093	0.0040	-0.0049	-4.38	0.57	-0.021
	(0.023)	(0.0078)	(0.0060)	(3.20)	(0.99)	(0.024)
Free×(15<d<30)	-0.0042	-0.031	-0.023	-10.9	0.90	0.011
	(0.046)	(0.040)	(0.018)	(7.86)	(2.36)	(0.016)
E. Traditional Services						
Transition×(15<d<30)	0.0083	0.0031	0.0043	0.38	1.31	0.060
	(0.0051)	(0.0025)	(0.0017)*	(0.27)	(0.37)**	(0.042)
Free×(15<d<30)	0.026	-0.0020	0.0091	0.67	4.98	0.11
	(0.024)	(0.021)	(0.0032)**	(0.67)	(2.32)*	(0.031)**
Firm and Time FE	X	X	X	X	X	X
Nuts III Trends	X	X	X	X	X	X

Notes: The table presents difference-in-differences estimates from Equation (1). This table decomposes the exits b qualification for incorporated firms only. All regressions include establishment and period fixed effects, as well as NUTS-III region linear time trends. Standard errors, clustered by local labor market, are in parentheses (* p<0.01, ** p<0.05, *** p<0.01). Source: INPS data.

Table 33: Margins of adjustment: Excluding firms in Construction and Utilities

	(1) Log Firm Size	(2) Average Log Wage	(3) Log Value added per capita	(4) Log Value Added	(5) TFP	(6) Log Assets per capita
			Panel A: Treated			
Transition×(d<15)	-0.012	0.0022	-0.066	-0.074	-0.074	0.062
	(0.016)	(0.0040)	(0.039)	(0.033)**	(0.028)**	(0.052)
Free×(d<15)	-0.012	-0.014	-0.078	-0.082	-0.100	0.084
	(0.036)	(0.0052)**	(0.024)***	(0.034)**	(0.020)***	(0.022)***
			Panel B: Moderately Treated			
Transition×(15<d<30)	-0.012	0.0047	-0.0062	-0.035	-0.0063	0.0077
	(0.013)	(0.0023)**	(0.017)	(0.022)	(0.012)	(0.026)
Free×(15<d<30)	0.014	0.0073	-0.0060	0.0090	-0.00077	0.076
	(0.016)	(0.0055)	(0.017)	(0.021)	(0.011)	(0.026)***
Firm FE	X	X	X	X	X	X
Time FE	X	X	X	X	X	X
Nuts III trend	X	X	X	X	X	X
R2	0.87	0.39	0.61	0.86	0.70	0.75
F-stat	25.1	36.9	5.04	2.94	14.2	10.1
Observations	749,774	13,319,577	250,494	250,494	247,736	259,417

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). The table replicates results from Table 6 excluding firms in Utilities (35-39) and Construction (41-43). All regressions account for establishment fixed effects, period fixed effects, and linear trends per NUTS-III region. INPS data and *Cerved* data.

Table 34: Margins of adjustment: Control group (4-6 hours) - All sizes – 4% sample

	(1) Exits Firm	(2) Log Firm Size	(3) Average Log Wage	(4) Log Value added per capita	(5) Log Value Added	(6) TFP	(7) Log Assets per capita
				Panel A: Treated			
Transition*(d<15)	0.0049	0.12	0.010	-0.16	0.084	-0.21	-0.19
	(0.0067)	(0.067)*	(0.012)	(0.048)***	(0.12)	(0.060)***	(0.070)***
Free*(d<15)	0.054	0.044	-0.023	-0.16	-0.026	-0.18	-0.19
	(0.022)**	(0.066)	(0.014)*	(0.079)**	(0.21)	(0.12)	(0.11)
Firm FE	X	X	X	X	X	X	X
Time FE	X	X	X	X	X	X	X
Nuts III trend	X	X	X	X	X	X	X
R2	0.64	0.94	0.40	0.90	0.92	0.82	0.89
F-stat	12.4	1.59	1.55	6.37	1.73	48.7	3.67
Observations	414,755	414,755	2,140,335	104,037	104,037	102,886	108,116

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). Regressions are weighted using 1998 FTE employment. The table replicates results from Table 23 for firms of all sizes.

Table 35: Margins of adjustment: Size 1-250 – 4% sample

	(1) Exits Firm	(2) Log Firm Size	(3) Log Wage	(4) Log Value added per capita	(5) Log Value Added	(6) TFP	(7) Log Assets per capita
				Panel A: Treated			
Transition×(d<15)	0.012	-0.011	-0.000033	-0.038	0.019	-0.023	0.091
	(0.0077)	(0.043)	(0.0057)	(0.034)	(0.061)	(0.034)	(0.049)*
Free×(d<15)	0.068	-0.029	-0.010	-0.12	-0.064	-0.12	0.056
	(0.024)***	(0.077)	(0.014)	(0.054)**	(0.13)	(0.075)	(0.13)
				Panel B: Moderately Treated			
Transition×15<d<30)	0.0041	-0.0087	-0.0025	0.064	0.039	0.038	0.11
	(0.0035)	(0.015)	(0.0069)	(0.039)	(0.038)	(0.053)	(0.024)***
Free×(15<d<30)	0.0095	-0.017	0.0021	0.0038	0.044	0.023	0.042
	(0.0056)	(0.028)	(0.0064)	(0.036)	(0.046)	(0.047)	(0.053)
Firm FE	X	X	X	X	X	X	X
Time FE	X	X	X	X	X	X	X
Nuts III trend	X	X	X	X	X	X	X
R2	0.62	0.91	0.43	0.86	0.90	0.74	0.86
F-stat	4.18	0.21	0.47	3.18	1.92	5.69	22.1
Observations	237,222	237,222	1,109,293	76,136	76,136	75,342	78,888

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). Regressions are weighted using 1998 FTE employment. The table replicates results from Table 24 for firms with between 1 and 250 FTE employees.

Table 36: Margins of adjustment: Size - Bigger than 3 – 4% sample

	(1) Exits Firm	(2) Log Firm Size	(3) Log Wage	(4) Log Value added per capita	(5) Log Value Added	(6) TFP	(7) Log Assets per capita
Panel A: Treated							
Transition×(d<15)	0.011	0.086	0.0047	-0.096	0.0059	-0.097	0.14
	(0.0071)	(0.019)***	(0.011)	(0.044)**	(0.13)	(0.040)**	(0.052)***
Free×(d<15)	0.076	-0.057	-0.0050	-0.15	-0.17	-0.24	0.19
	(0.026)***	(0.078)	(0.015)	(0.069)**	(0.22)	(0.13)*	(0.17)
Panel B: Moderately Treated							
Transition×(15<d<30)	0.0063	-0.063	-0.0076	0.030	0.013	0.028	0.060
	(0.0047)	(0.026)**	(0.0080)	(0.058)	(0.063)	(0.070)	(0.062)
Free×(15<d<30)	0.013	-0.17	0.013	-0.026	-0.13	-0.11	0.15
	(0.0076)*	(0.071)**	(0.012)	(0.041)	(0.057)**	(0.062)*	(0.085)*
Firm FE	X	X	X	X	X	X	X
Time FE	X	X	X	X	X	X	X
Nuts III trend	X	X	X	X	X	X	X
R2	0.20	0.95	0.44	0.89	0.89	0.77	0.88
F-stat	4.73	17.3	0.90	4.04	6.36	7.77	3.03
Observations	79,328	79,328	1,077,613	33,620	33,620	33,345	34,595

Notes: Standard errors are clustered by local labor market (* P<0.1, ** P<0.05, *** P<0.01). Regressions are weighted using 1998 FTE employment. The table replicates results from Table 24 for firms with more than 3 FTE employees.