

**The Impact of Immigration on the Natives' Labor Market Employment:  
Evidence from Italian Regions.**

**Stefano Fusaro**

*MSc in Economics, Universitat de Barcelona*

**Advisor: Enrique López-Bazo**

*Universitat de Barcelona (AQR-IREA)*

**Abstract.** *The aim of this paper is to disentangle, from an empirical point of view, the economic impact of immigration into the labor markets of the Italian administrative regions. To this purpose, we have followed the empirical strategy set by Basso and Peri (2015). In order to construct the dataset, we have used information drawn from the Labor Force Survey (LFS) conducted by the National Statistic Office of Italy (ISTAT). We have performed several empirical analyses. First of all, we have computed the aggregate correlation between the change in natives' employment and the change in immigrant population. Then, in order to disentangle the spatial correlations between foreign-born and domestic workers (see Borjas, 2014), we have divided the native population into eight education-experience cells, and computed the correlations between immigrants and natives within skill location cells. In a further step, we have introduced in our baseline specification a proxy for the labor demand growth, namely the "Bartik" instrument. Finally, to address the endogeneity issue and therefore to conclude on the causal relationship between immigrants and natives' labor market performances, we have performed an IV/2SLS approach, using the so-called "shift-share" instrument. In general terms, the results obtained indicate that the impact of immigration on native employment is positive or null.*

**Keywords:** *Immigration, Labor Markets, Employment, Bartik Instrument, Shift-Share Instrument, Italian Regions.*

**JEL Codes:** J15; J61; R23.

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## **1. Introduction.**

The last few decades have been characterized by an astonishing increase of the international migration phenomenon. According to the United Nations, between 1990 and 2015, migration flows have grown worldwide by around 60%, figure that corresponds to 91 million individuals. The biggest increment has occurred in the decade between 2000 and 2010, when almost 4.9 million individuals have decided to change their place of residence. On the contrary, in the previous decade (i.e. from 1990 to 2000) the migration flows were less than half (the worldwide average was 2 million international migrants). From 2010 to 2015 the phenomenon has followed the same increasing pattern, with a migration flow of almost 4.4 million individuals (United Nations, 2016).

More than the half of all international migrants reside in only ten countries. The United States are the most affected, with 47 million foreigners residing there in 2015 (figure that corresponds to the 19% of the worldwide total). They are followed by Russia and Germany, hosting 12 million immigrants each, Saudi Arabia with 10 million, United Kingdom and the United Arab Emirates with 9 and 8 million, respectively. In addition, in the same period, the share of foreign-born individuals over the total population has increased even in countries historically less used to migration. It is the case of Portugal, Norway, Spain, Sweden and Austria (Borjas, 2014).

This unexpected and unprecedented rise of the international migration phenomenon, has eased the entrance of foreign born workers in the host countries' labor forces. To this extent, immigrants have become a structural component of both the economy and the productive sector of many developed countries. The evaluation of the socio-economic impact of immigration has been object of deep analysis in labor economics for almost three decades. In addition, because of the recent international developments, it has become, again, central in the academic and political debate.

Overall, one important feature of the economics of immigration is that it has important policy implications. These give rise to different questions, that, in turn, are politically sensitive. In this context, both economic theory and empirics have tried to find unambiguous answers to these questions. The main goal is to disentangle the effect that immigrants exert over natives' wages and employment opportunities.

In this context, the aim of this work is to shed new light over the economic impact of immigration. The analysis is based, from the empirical point of view, on the study carried-out for the United States by Basso and Peri (2015), which indicates the absence of negative effects of immigration on employment and wages of the U.S. born.

The decision to replicate Basso and Peri's (2015) work for the Italian case, in the recent period, depends on many factors. First of all, as in many other developed countries, in Italy the debate on immigration has reached unprecedented levels. As pointed out by Gavosto et al. (1999), the Italian public opinion is split into two opposite factions. On the one hand, the opponents of immigration underline how the phenomenon has only negative economic implications, because it reduces both wages and employment possibilities of natives. On the other hand, the partisans state that immigrants can instead act as a complementary with respect to natives, because they undertake jobs and occupations usually refused by the latter. Migration flows indeed consisted, at least initially, in low-educated individuals<sup>1</sup>, many of whom are concentrated in low-skilled and low-paid jobs, with almost no possibilities to upgrade their socio-economic conditions. In addition, the last decade was characterized in Italy by an alarming deterioration of the labor market performances on the one hand, and, on the other, by the unprecedented rise of migratory inflows. In this scenario, a part of the political class, together with the public opinion, have blamed immigrants for the decline in the economic conditions of the country.

In such circumstances, it is at the same time interesting and useful to carry-out an empirical exercise that allows to verify what is the actual impact of immigration into the Italian labor market. To be precise, the objective of this analysis is to assess what are the effects (if any) of immigration on Italian workers' employment. In other words, we aim at disentangling whether immigrants' inflows are associated with a decline in natives' employment levels. To this extent, the hypothesis to test is that, as Basso and Peri (2015) found for the U.S., the impact of foreign-born workers over the employment of the native born is negligible. In order to empirically verify this hypothesis, we follow Basso and Peri's (2015) empirical strategy. We use data for the Italian administrative regions, over the period 2006-2016. Initially we consider the whole native population together, while, in a second step, we divide it into two samples, distinguishing between low and high-skilled individuals. Overall, in contrast with the negative vision of immigration, this study indicates that, consistently with the initial hypothesis and with Basso and Peri's (2015) findings for the U.S., the impact that immigrants exert over natives' employment level is even absent or positive.

Before presenting the structure of the paper, It is important to underline that a lack of access to data on wages has prevented us to analyze the effect of immigration on natives' earnings.

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<sup>1</sup> Mostly because of a poor knowledge of the Italian language and imperfect transferability of human capital.

The rest of the paper is organized as follows. Section 2 illustrates the background of the study. Specifically, we contextualize the Italian economy and we review the literature on the economic impact of immigration. Afterwards, in section 3, after a brief overview of the theoretical framework, we present the empirical strategy followed. Section 4 is devoted to the description of the database used and the variables involved and then to the presentation of some descriptive evidences. Empirical results are presented and discussed in section 5. Specifically, we distinguish between simple regressions, exploiting the average correlations and more sophisticated procedures that allow us, on the one hand, to control for the omission of relevant variables, and, on the other, to disentangle the causal relationship between the variables involved. We finally conclude the study in section 6, indicating its drawbacks and some possible improvements.

## **2. Background of the Study.**

This section presents in detail the tendencies that have characterized the Italian economy in the decade under analysis, both in terms of macroeconomic trends and in terms of migratory inflows. It also reviews the literature of the economic impact of immigration, highlighting in particular the findings for Italy.

### **2.1 The Context of the Italian Economy.**

The present study analyzes the effect of immigration on the Italian labor market. It is then appropriate to present a brief overview of the Italian economic and institutional framework in the period considered. The global financial crisis and the European sovereign debt crisis, have severely hit the Italian real economy. According to OECD (2017), Italy is only now starting to recovery from the long and deep recession that has characterized the last decade. The figures are quite impressive. Since the beginning of the crisis, Italy has suffered of a drop in the real GDP per capita of about ten percentage points (recent estimates indicate that it is now at the same level of 1997). In this scenario, one of the sectors more harshly affected was the labor market. From a general comparison of work performances of the Italian population before and after the crises, it is easy to notice that many indicators have extremely worsened. The National Statistic Office (ISTAT) indicates that the unemployment rate has indeed considerably increased, from the 8 percent level of 2004, to the 11.9 percent of 2015. The category that seems to have suffered the most is the one composed by young individuals (i.e. people between the ages of 15 and 24). Specifically, the youth unemployment rate has increased from 23.5 percent in 2004 to 40.3 in 2015. These negative trends have, in turn,

increased the number discouraged workers<sup>2</sup>. To this extent, the long-term unemployment rate has boosted. After starting from 47.6 percentage points in 2004, it has reached a level of 58.1 percent in 2015. Furthermore, in the period subsequent to the crises, there has been an increase in the number of temporary contracts. The figures reveal that, in the period between 2004-2015, the percentage of workers with a fixed-term contract has increased by about 2.2 percentage points: from 11.8 in 2004, to 14 percent in 2015<sup>3</sup>.

Alongside the economic downturn, Italy has been characterized in the last decade by a significant increase of the migration inflows. Italy has historically been a country of emigration, more than of immigration. Since its unification in 1861, until the late 70's, almost 26 million Italians migrated abroad, half of them towards North and South America and the other half towards European countries (Del Boca and Venturini, 2005). However, mostly because of its position in the center of the Mediterranean Sea, since the beginning of the XXI century, Italy has become one of the most active migrant-receiving countries. According to OECD (2014), together with Spain, Italy is the European country with the highest increase of the foreign-born population (both in absolute terms and as a share of the total population). The National Statistic Office indicates that, up to December 31<sup>st</sup>, 2015, the number of people with foreign citizenship residing in Italy was around 5 million, which corresponds to the 8.3 percent of the total population. In terms of non-EU citizens, according to the Ministry of the Interior, up to January 1<sup>st</sup>, 2016, almost 4 million individuals legally reside in Italy. The more represented countries are Morocco (with 510,450 individuals), Albania (482,959), China (333,986) and India (169,394) (ISTAT, 2016). In addition, in the last few years, Italy has become a major destination also for not-legal immigrants, most of which have entered the country through the Mediterranean Sea. Between 2014 and 2015, the estimates indicate that around 325,000 irregular immigrants have arrived in the Italian soil. The pattern has been confirmed even in 2016, with about 115,000 new arrivals.

In the last few years, the recession seems to have slowed down. According to OECD (2017) and Bank of Italy (2017), the economic recovery is underway. In the fourth quarter of 2016, the GDP has increased of 0.2 percentage points, with respect to the previous period. This small but important

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<sup>2</sup> Defined as people that have looked for a job for a relatively long period of time, without success and, therefore, they have decided to stop the search. In order to enter in this category, the length of the job search varies across countries. In Italy are considered discouraged workers those individuals that have stopped to look for a job since, at least, the four previous weeks with respect to the interview of the Labor Force Survey (ISTAT, 2017).

<sup>3</sup> All the figures presented are drawn from the report "Noi Italia – 100 statistic to understand the country we live in", produced by ISTAT.

increase has also favored the recovery of the labor market. According to the Labor Force Survey (LFS)<sup>4</sup> conducted by the National Statistic Office, the trend in employment has reached the levels previous to the crisis in the Central and Northern regions, while the Southern ones have only partially recovered. This geographical distinction between North (together with Center) and South clearly reflects the huge economic gap between these two parts of Italy. Always according to the Bank of Italy (2017), the slow recovery of the Southern regions can partly depend on the fact that they are characterized by consistent out-migration flows, especially relative to young individuals with medium and high levels of education.

Overall, in any case, the fourth quarter of 2016 has been characterized by a rise in the employment rate, that has reached the 57.4 percent level. Specifically, it grew by almost one percentage point with respect to the previous quarter, and by two percentage points with respect to the minimum level of 55.3 percent registered the third quarter of 2013 (ISTAT, 2017).

The reasons behind this economic recovery can be found in the set of institutional reforms that took place in Italy in the last years. In particular, the so-called “Jobs Act” seems to have triggered the upturn of the real economy (OECD, 2017). It consisted in a set of reforms of the labor legislation that has been promoted by the former government, headed by Matteo Renzi. Among other things, the reform was aimed at modifying the *status quo* in terms of job protection, active labor market policies, that could foster the integration into the labor market of weaker categories (like women and immigrants), job flexibility and bureaucratic simplification.

In terms of the institutional framework, one important feature of the Italian labor market is the crucial role played by unions, especially in terms of wage bargaining, which, in Italy, is centralized at the national level. This implies that the wage flexibility is, to some extent, reduced (as it is typically the case of continental Europe) with respect to countries like the United States in which the wage bargaining is mostly de-centralized. As we will explain more carefully in the next sections, all these aspects have important implications within the context of the economic impact of immigrants in the Italian labor markets.

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<sup>4</sup> The LFS is conducted on a quarterly basis and gives estimates of the main economic aggregates, relative to the Italian labor markets (e.g. employment status, type of job, job search, etc.). The informations provided are disaggregated by gender, age, citizenship and geographical scope.

## 2.2 Literature Review.

In the last three decades, the analysis of the economic impact of immigration has become a central topic in the labor economics literature. Especially because of its important policy relevance, many papers have been written on the topic. The attention has been focused on two main aspects: the economic assimilation of immigrants (and their offspring) in host countries socio-economic context on the one hand, and, on the other, their impact on natives' labor market performances (i.e. wages and employment opportunities). The vast majority of published papers analyze longstanding countries of immigration, the United States above all. Several studies have been carried-out and the results are somewhat contradictory. Some researchers conclude in favor of positive or null effects of immigration (see, for instance, Altonji and Card, 1991; Card, 2001, 2005, 2009, 2012; Card and Butcher, 1991; Peri and Sparber, 2009; Ottaviano and Peri, 2012), while others present a scenario in which immigrants depress natives' labor market outcomes (e.g. Borjas, 1994, 2003, 2005).

One of the first and, probably, one of the most famous papers on the topic is the one by Card (1990). Specifically, this paper analyzes the effect of the Mariel Boatlift of 1980 on the Miami's labor market, which caused an increase by 7% in the Miami labor force, corresponding to around 125,000 individuals<sup>5</sup>. The author shows that the distribution of non-Cubans' wages was remarkably constant between 1979 and 1985. Therefore, the effect of the Mariel immigrants on natives' earnings was small and negligible. Analogous results are found relatively to black individuals' wages, as well as for the pattern relative to the differentials of both employment and unemployment rates. Furthermore, the author analyzes the effect of Marielitos on other Cuban workers' earnings. Even in this case, the empirical strategy shows no evidence of negative effects in the years successive to the boatlift. The data show instead a rapid absorption of the Mariel immigrants into the Miami labor force. This phenomenon can be due to the fact that Miami's labor market is better prepared to receive immigrants' inflows than other American cities. Both before and after the Mariel Boatlift, Miami has received a slow but constant flow of foreigners (mainly Cubans, Nicaraguans and other Central American individuals). This allows the author to state that the Mariel immigration was not a sudden and unexpected phenomenon, but part of a broader pattern that has characterized Miami since the early 80's. Miami's labor market was indeed characterized by a huge demand of low-skilled jobs, demand that was partly matched by Marielitos. In addition, Miami's labor force is characterized by

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<sup>5</sup> Though, it is important to underline that, due to the non-authorized nature of the boatlift, there are no official data about the exact number of individuals or about their actual final destinations. However, most reliable information sources estimate the number of *Marielitos* at between 120,000 and 125,000.

a strong fraction of Spanish-speaking workers. This phenomenon can have helped the integration of newly arrived individuals.

Both findings and the empirical strategy of Card's paper are criticized by Borjas (2017). In this study, the author shows that the vast majority of Marielitos were low-skilled individuals (high-school dropouts) and, after the boatlift, the number of high-school dropouts in the Miami labor market increased by 20 percentage points. Because of this reason, the author argues that the right procedure to carry out is to compare, in a quasi-experimental setting (difference-in-differences), the wage of high-school dropouts before and after the Mariel inflow. In order to estimate the impact of the Mariel inflow, Borjas uses as dependent variable of the difference-in-differences estimation the logarithm of the mean-age adjusted wage of high-school dropouts. In addition, he uses different placebo cities, to construct the control group used to build the counterfactual. In any case, regardless of the placebo used, the empirical strategy shows that the parameters estimated of the impact of Marielitos on high-school dropouts' earnings are negative. This implies that, contrary to Card's findings, the Mariel Boatlift had a negative impact on low-skilled natives. Evidences show that, between 1983 and 1986 (i.e. years immediately successive to the boatlift) the wages of this group of workers experienced a decrease of around 10 to 30 percentage points. However, consistently with Card's analysis, the effect tended to lower its intensity in the long-run and vanished completely in 1990.

The extent of the economic impact of immigration has been analyzed also in European countries with a longer tradition of immigration. It is, for instance, the case of the United Kingdom (see, among others, Dustmann et al., 2006, 2008, 2010), France (e.g. Hunt, 1992; Gross, 2002) or Germany (D'Amuri et al., 2010; Dustmann et al., 2010). However, the fast and unexpected growth of the migration flows that has characterized the last few years, has caused the development of a huge branch of literature analyzing the matter even in countries less used to this phenomenon. It is the case of Spain (e.g. Carrasco et al., 2008; Motellón and López-Bazo, 2015a, 2015b; Nicodemo and Ramos, 2012) and Italy. As for Italy, one of the first and most important studies on the economics of immigration is the one by Gavosto et al. (1999). In the paper, the authors address the issue of whether immigrants from less developed countries are complementary or substitutes to domestic workers. They construct a dataset from the Social Security Archive on Private Employment (SSA) and consider only individuals born outside the European Union and the main developed countries.<sup>6</sup>

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<sup>6</sup> This choice allows researchers to avoid considering as immigrant individuals born outside Italy, but from Italian parents.



To disentangle the wage impact of immigration, the authors adopt a two-stage procedure. In the first stage, they regress the change of the logarithm of natives' wages to a set of individual characteristics, together with region-sector fixed effects, considering a period of time between 1990 to 1995. Afterwards, they regress all the coefficients of the regional-branch dummies, estimated in the first stage against a set of variables at the same level of aggregation. More precisely, they consider the rate of change in the value added by industry and region, and immigrants' inflow rate into employment<sup>7</sup>. Moreover, in the second step, in order to avoid the potential bias caused by the omission of relevant variables, they introduce time, sector and region fixed effects. Results show that the immigrants' inflows are associated with an increase of native manual workers' wages. This implies that foreign-born workers act like complementary with respect to native ones. Moreover, this positive effect is bigger in small firms and is especially found in the Northern regions. The main reason behind this positive effect depends on the existence of labor constraints on the firms' side. In other words, many companies are unable to increase their productivity because of a lack in natives' workforce<sup>8</sup>. Immigrants, can instead represent a valid solution to this problem. However, authors also show that, over a certain level in the share of foreign workers over the total labor force (estimated between 7.7 and 12 percentage points), every additional inflow of foreign workers has a negative effect on natives' earnings (i.e. immigrants compete with natives).

Another interesting article about the labor market effects of immigration, is the one by Venturini and Villosio (2006). The aim of this study is the same of the one by Gavosto, et al. (1999). To this purpose, authors analyze the effect of immigration on national workers' probability of transition from employment to unemployment and the other way around. Two key features of the economics of immigration are examined: *displacement risk* and *job-search effectiveness*. The first refers to a situation in which employed workers are replaced by migrant workers. This phenomenon can occur because their occupations are similar to immigrants' ones. Alternatively, it can also happen when natives belong to more weak categories in terms of labor security, like young people, or low-skilled workers. Job search effectiveness consists instead in the reduction of the probability to find a job position for native-born workers. As in the previous case, the effect of migrant workers on job search for natives can vary for young, first-job seekers and for workers looking for a new job, (i.e. older workers with work experience). In order to obtain "cleaner" results, the analysis of the transitions

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<sup>7</sup> This figure is computed taking the difference between the share of immigrants and natives employed, in each industry and region between two periods.

<sup>8</sup> Or rather, natives are not willing to undertake the occupations that would allow firms to increase their productivity, because, very often they are low-skilled (mostly manual) jobs.

from different labor statuses<sup>9</sup> is carried out only considering those sectors characterized by a higher concentration of foreign-born individuals (for instance of manufacturing, commercial, and transport industries). In the paper, the probability of an individual, residing in a particular region, to change his/her employment status depends on two sets of explanatory variables. The first one refers to individuals' characteristics, while the second is relative to the peculiarities of the labor market in the region and at the time considered. The latter can be additionally split in two parts. One indicates the share of foreign workers in the region considered. The other captures instead other variables that can play a role in the extent of the transition between different statuses. The authors analyze separately displacement risk and job search effectiveness. In the section devoted to the latter, they consider separately the search for the first job from the search for a new one. In the first case, they find that, in Northern and Central regions, the presence of migrant workers reduces the probability of finding a job only in 1993, while no significant effects are found in subsequent years. They attributed this competitive effect to the end of the 1991 amnesty, which caused the introduction of about 200,000 migrant workers in the labor market in just one year. In 1997, a complementary effect seems to prevail: an increase of 1 percentage point in the share of migrant workers, drives to a transition from unemployment to employment by 8.6 percentage points. In addition, in order to obtain a more precise estimation, the authors subdivided foreign-born individuals in different categories, according to their education levels. The reason behind this choice is that the effects at the aggregate level can hide different group effects. In this case, migrant workers do not reduce the probability of finding a job for highly-educated natives or for those with a low level of education. However, the ones characterized by a medium level of education are mostly at risk, but this result was found significant only in 1993. Another important result is that, when immigrants were complementary (in 1997), they complemented native workers who were less well educated, by favoring total employment. In the case of a search for a new job the overall impact of immigrants on the transition probability is either positive or not significant. More precisely, in 1996 migrant workers in Northern and Central regions are complementary with respect to all skill groups, while in the South they complemented only the less skilled natives. On the other hand, in the South and for those individuals with a medium-level education (i.e., the group likely to be most at risk) competition was present only in 1995. In the case of displacement risk, the results are consistent with previous findings. Overall, the share of migrant workers seems to have either no effects or a complementary one on native workers. The only two exceptions are found in the building industry

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<sup>9</sup> From employment to unemployment, and the other way around.

in the North in 1993, and in manufacturing in the North in 1996. However, if the variable for the migrant workers' share is reported with a lag (in order to capture not only the length of the search for a new job, but also the transition probability between employment to unemployment), the effect registered for 1996 was the same and continued into the following year. So, all-in-all it is possible to state that the effect of foreign workers on native workers, at any level of education, appears to be null until 1995. A form of competition is found for national workers with low and, particularly, medium levels of education of any age group. In addition, the total number of transitions from employment to unemployment is decreasing. The number of fired workers decreases, as well as the number of workers leaving employment because their temporary contract has ended. These results are consistent with Gavosto, Venturini and Villosio (1999) and indicate that immigrant mostly play a complementary role in the Italian economy.

More closely related to the analysis in our study is Romiti (2011) which replicates the study of Card (2001), for the Italian economy. The author estimates the labor market impact of immigration into Italy, by defining the local labor markets in terms of area, skills, immigration status and gender. The estimated inverse elasticity of substitution between natives and immigrants is 0.05. This provides evidence about the fact that immigrants and natives belonging to the same skill-area cell are less than perfect substitutes. On the contrary, female and male individuals within the same skill-immigration cell are perfect substitutes. In addition, the author shows a strong complementarity between high and low-skilled workers (the estimated elasticity is about 2<sup>10</sup>). Finally, using the estimated parameters the author carries on some simulations based on the year 2002. She shows that immigrants are the most affected group, and in particular the low-skilled ones, since they experience a reduction of their wages by about 3.5 percentage points. The impact on low-skilled natives is lower, with a decrease in wages of only 1 percentage point. Summarizing, these results show that immigrants do not displace natives and natives' employment rates are basically unaffected by immigration inflows.

From a complementary perspective, the paper by Fullin and Reyneri (2011) is aimed at understanding the integration of immigrants in the Italian labor market. Based on the Italian LFS, the analysis shows that immigrants are not disadvantaged in terms of unemployment risk. However, they are severely disfavored in terms of the socio-professional status of their jobs. In other words, this means that no matter what are their skills or educational levels, immigrants face difficulties to

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<sup>10</sup> This result is considerably lower than the one found by Card (2001), as the estimated elasticity for the U.S. varied in a range between 5 and 10.

find occupations that would allow them to exploits their working abilities. The reason behind this phenomenon can be the fact that most of the immigrants have entered in Italy without working permits, and have been forced to work “off-the-book”. Moreover, when they finally were able to gain the rights that allow them to obtain a legal job position (through a regularization process), their working conditions only rarely improve. This phenomenon is valid for high-educated individuals, too. This aspect indicates that, for immigrants, human capital endowment is not an important determinant within the context of the reduction of the so-called *ethnic penalty*. Immigrants’ segregation in low-qualified, typically manual occupations, does not depend on their individual characteristics, but it mostly derives from the particular structure of the Italian labor market. More precisely, it is a consequence of the existent gap between labor demand and natives’ labor supply<sup>11</sup> and on a severe segmentation by age, gender, region and educational attainments. This clustering of immigrants in low qualified job is also accentuated by a serious lack of qualified labor demand. In addition, the situation is enhanced by the poorly efficient and effective welfare state, together with an unsuitable labor market regulation. These aspects prevent the complete integration of foreign-born workers. Specifically, immigrants have a relatively easy access to low-qualified jobs, but they struggle to obtain high-skilled, non-manual jobs. Finally, the authors also point out that, because of the previously mentioned characteristics, and because of the huge underground economy, the Italian labor market somehow favors unauthorized immigration. This implies thus the confinement of legally registered immigrants to poorly qualified jobs.

### **3. Empirical Strategy.**

In this section, we first briefly specify the theoretical foundations of the economics of immigration. This allows us to highlights the resulting predictions on the economic impact of foreign-born workers on the native labor market performance. Afterwards, we present the empirical model chosen to test the hypothesis.

#### **3.1 Theoretical Framework.**

In the past three decades, the analysis of the economic impact of immigration has been a central topic in the labor economics literature. Many researchers have tried to disentangle the issue,

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<sup>11</sup> As already indicated, native workers tend to refuse low-skilled manual jobs. Therefore, those occupations are usually undertaken by immigrants, even though their human capital endowment could allow to occupy better positions (both in terms of hours worked and wages).

focusing particularly on the extent to which immigration has a positive or negative effect on the labor market performances of natives. In other words, the objective was to understand what are (if any) the costs and benefits of immigration for the host countries. In addition, the focus has also been put on whether the impact of immigration involves equally the whole domestic population, or rather it affects separately, and to an uneven extent, different groups (e.g. skilled versus unskilled). The previous literature has provided different answers (even contrasting between them) to these questions, both from theoretical and empirical points of views. In this section, we will focus on the theoretical arguments, while an empirical strategy will be presented afterwards.

The economic impact of immigration can be initially analyzed within the context of a simple labor demand and supply framework<sup>12</sup>. Let's assume, for simplicity, that the labor market is at its equilibrium. In the short-run, if the labor demand is negatively sloped and immigrants and natives are perfect substitutes (i.e. homogeneous workers), an immigrant-induced supply shock is associated, *ceteris paribus*, with a decrease of natives' labor market outcomes. In the long run, instead, assuming that the supply of capital is perfectly elastic<sup>13</sup> (see, to this purpose, Dustmann, et al., 2008), firms can adjust their capital-labor ratios and, therefore, wages and employment level are supposed to return back to the equilibrium levels. In other words, this basic model predicts that immigration has negative effects on the natives only in the short-run, and that they vanish in a longer time frame (Basso and Peri, 2015).

However, the reality is far more complex than described in this initial setting. First of all, to consider immigrants and native homogeneous workers is a strong assumption, often not realistic. In addition, the immigrant-induced supply shocks can positively affect firms' productivity and technology. This, in turn, can cause the immediate capital adjustment that can bring the economy to its equilibrium (Basso and Peri, 2015).

In order to address the issue of whether immigrants and natives are complementary or substitutes, the previous literature has implemented the skill-cells approach. It is assumed that, in order to assess the economic impact of immigration, it is fundamental to understand the skill composition of the foreign-born population. The way in which skills are defined change slightly between the various studies, but, overall, key elements are educational levels (see, for instance, Altonji and Card, 1991), occupation (Card, 2001) or a combination between education and experience (Borjas, 2003).

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<sup>12</sup> For an overview of the matter, see, for instance Borjas (2003).

<sup>13</sup> Put in simple words, this means that the interest rate at which firms can buy capital is fixed and set at the international level.

In this setting, the economy is composed by two types of workers: skilled and unskilled. Immigrants and natives can belong contemporaneously to both categories. In addition, they are considered as perfect substitutes<sup>14</sup> within the same skill-cells. Finally, two more assumptions are needed: as before, the supply of capital is perfectly elastic and the labor supply of both skilled and unskilled workers is perfectly inelastic. In other words, both types of workers always supply labor, irrespective of the wage level. In the case of an immigrants-induced supply shock, the economy can adjust through different mechanisms, for simplicity we will analyze only wages and employment. Before the supply shock, the shares of skilled and unskilled workers over the total labor force are equal and the labor market is at its equilibrium<sup>15</sup>. The model predicts that the newly arrived foreign-born workers can alter the equilibrium only in the case in which their skill composition is different from that of natives. Assuming, for example, that a huge fraction of immigrants is unskilled, this implies that the economy is now characterized by a larger supply of low skilled labor. This alteration produces therefore a drop in the wages of low-skilled natives. However, in this new situation firms are able to match their unskilled labor demand, at even lower wages with respect to the initial equilibrium. Furthermore, this phenomenon causes a scarcity of skilled workers relatively to unskilled ones. Therefore, the skilled workers present in the economy will receive higher wages. Then this model predicts that, while immigration will somehow damage low-skilled workers, it will benefit high skilled ones. However, Dustmann et al. (2008) show that the surplus that high skilled workers receive is higher than the welfare loss associated to the low-skilled ones. This means that, at the aggregate level, the economy will benefit from immigration.

If we now relax the hypothesis of the perfectly inelastic labor supply, things change slightly. In the case in which labor supply is elastic, in fact, some workers will react to the drop in wages caused by an immigrants-induced supply shock by deciding not to work anymore. Therefore, the economy will be now characterized by voluntarily unemployed native workers. In this case, then, the surplus caused by immigration is smaller than in the case of a perfectly inelastic labor supply.

It is important to underline, at this point, that the economy can also adjust through different mechanism, like changes in the output mix or technological changes (Dustmann et al., 2008). However, even in these cases, the effects of immigration are similar to the ones already described. This theoretical framework implies different conclusions. First of all, as already stated, immigration can alter the original equilibrium only if the skill composition of the newly arrived (immigrant)

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<sup>14</sup> This implies that foreign-born workers can take-over natives' jobs, within the same skill groups.

<sup>15</sup> Without loss of generality, equilibrium wages are allowed to differ across groups.

workers is different from that of natives. Conversely, in the case in which natives and foreigners are characterized by the same skill composition, immigration will only modify the scale structure of the economy, without any real effect on its labor market performances (Dustmann et al., 2008). Second, in this simple framework we have assumed that the supply of capital is perfectly elastic and the results obtained depend on this feature indirectly. However, it is important to stress that this is not always the case. Consequently the effects<sup>16</sup> that immigrant exert on the host country's labor market can change, in the case in which this assumption is relaxed.

### 3.2 Empirical Model.

Taking into consideration the contrasting prediction of the theoretical model and the previous empirical evidences, we follow two different empirical approaches to assess the effect of immigration on the employment of the native population in the Italian regions in the last decade. In the first one we aim at disentangling the impact of immigration measured in aggregate terms, in a particular region, over the natives' employment. Initially we aggregate all native-born workers together, then we divide them into two samples: the first composed by highly educated individuals (i.e. people with, at least, a university degree), and the second composed by low educated individuals (i.e. with less than a university degree). The reason behind this distinction is that the previous literature has found that immigrants can act as complementary for a part of the natives' population, namely the highly educated one (Barone and Mocetti, 2011), and as substitute for natives with low levels of education (Altonji and Card, 1991).

This first set of regressions takes the following form:

$$\Delta(emp_{i,t})^{ITB} = \varphi_i + \varphi_t + \beta\Delta(immi_{i,t}) + \varepsilon_{it} \quad (1)$$

where  $\Delta(emp_{i,t})^{ITB}$  and  $\Delta(immi_{i,t})$  are defined as the change in native employment and the change in immigrant population, respectively<sup>17</sup>. In addition,  $\varphi_i$  and  $\varphi_t$  indicate region and time fixed effects, respectively and, finally,  $\varepsilon_{it}$  is a random term i.i.d distributed with zero mean and variance  $\sigma_\varepsilon^2$ .

The coefficient of interest is  $\beta$ , which indicates the impact, expressed in percentage points, of a unitary percentage increase in the immigrants' change in region  $i$ , standardized by the initial population, on the natives' employment in the region.

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<sup>16</sup> Both their magnitude and signs.

<sup>17</sup> A detailed explanation of the variable construction is given in section 4.

The second set of regressions still considers the correlation between immigrants and natives' employment, but within skill-region cells. In this framework, we have divided the native population into eight different skill-cells, that are composed by four educational levels (low education, lower secondary education, upper secondary education, or high school diploma, and university degree) and two experience levels (at most fifteen years of experience and more than fifteen years). This procedure allows us to reshape the initial dataset, and create groups of individuals that are more homogeneous (in terms of labor market characteristics) between them and, therefore it is more likely that they compete for a job position (Lewis and Peri, 2015).

These regressions take the following form:

$$\Delta(emp_{i,k,t})^{ITB} = \varphi_i + \varphi_k + \varphi_t + \varphi_{i,k} + \varphi_{i,t} + \varphi_{k,t} + \beta\Delta(immi_{i,t}) + \varepsilon_{it} \quad (2)$$

where the subscript  $k$  indicates the skill-cell. We also include region, time and skill fixed effects, together with the interactions between them. This allows us to control for further unobserved heterogeneity, that we did not take into account in the initial set of regressions. As before, the coefficient of interest is  $\beta$ , that is as an estimate for the effect of the presence of immigrants on the natives' employment (Borjas, 2014). However, an important limitation of this approach is that the estimated coefficients represent only the *partial* effect of immigration, because they indicate exclusively the impact of immigrants on the most similar natives (Ottaviano and Peri, 2012). Assuming that the labor supply shock caused by immigration is exogenous, this kind of analysis can be interpreted as a sort of reduced-form regression, that exploits the impact of foreign-born workers on the change in employment, for natives belonging to a particular skill-cell (Borjas, 2014). One important feature that characterize the labor market performances, of both natives and immigrants is the evolution of the industry in which they are employed. As we have already indicated, the last decade was characterized initially by the global financial crisis, and, more recently, by the European sovereign debt crisis. Italian real economy was strongly affected by both shocks, and, consequently, its labor market experienced some turbulences. One of the most important peculiarities of the Italian economy is its well-known geographical disparities, both in terms of labor market performances and sector specialization. The Northern regions, Lombardy above all, are characterized by higher wages, employment rates and productivity and by more technology-intensive industries. The Southern and some Central regions are instead characterized by poorer labor market conditions and more labor-intensive industries. A direct consequence of this



distinction is that different regions have been hit by the crisis in a different way. Therefore, as suggested by Basso and Peri (2015), it is important to control for those productivity changes that different industries can have experienced in the period of time considered. To this extent, in the regional and urban economics literature, one of the more widely used methods to capture these changes in labor demand is the so-called “Bartik” instrument<sup>18</sup>. With this method, it is possible to isolate shifts in the local labor demand that are caused by shocks occurred at the national level. In this way, it is also possible to remove the endogenous relationship that occurs between local wages and employment levels and local labor demand changes<sup>19</sup>. Therefore, we have decided, following the path set by Basso and Peri (2015), to introduce in the analysis the so-called “Bartik” instrument<sup>20</sup>. To this extent, equation 1 is modified as follows:

$$\Delta(emp_{i,t})^{ITB} = \varphi_i + \psi_t + \beta_1 \Delta(immi_{i,t}) + \beta_2 \Delta(Bartik_{i,t}) + \varepsilon_{it} \quad (3)$$

In this new specification, the coefficient of interest is  $\beta_1$  which, as before, indicates the impact of a unitary percentage increase in the change in immigrants (standardized by the initial population) on the change in natives’ employment in region  $i$ .

Another issue that often arises when analyzing the economic impact of immigration on natives’ labor market performances is the presence of endogeneity (Lewis and Peri, 2015). Immigrants’ location decisions are indeed not randomly taken, but they are connected with the labor market outcomes (measured both in terms of wages and in terms of employment opportunities) of the destination regions (broadly speaking). Therefore, this can create a bias in the estimated coefficients of the regressions. To this purpose, it is important to underline that equation 1 is characterized by the possible presence of endogeneity. A common way to solve this problem is to use an instrumental variable approach. This, in addition, can be a helpful method in order to disentangle the causal relationship (if any) between immigrants’ inflows and natives’ employment. Following the path set Altonji and Card (1991), a commonly used approach is to build a variable that proxies the labor supply-driven shocks of the immigrants’ inflow. The main idea behind this instrument is that immigrants tend to move to location characterized by the presence of other individuals coming from

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<sup>18</sup> Its name is due to Bartik (1991).

<sup>19</sup> Basically, it is assumed that productivity shocks that affect a country as a whole (i.e. that occur at the national level), are not directly correlated (i.e. are exogenous) with respect to changes in the labor demand that are localized in only a part of the country or in one or few particular sectors.

<sup>20</sup> For details on the variable construction see the data section.

the same country. In other words, there is some sort of serial correlation process, in the sense that the number of foreigners in region  $i$  and at time  $t$  is somewhat connected with its lagged value. In addition, the figure so constructed is assumed to be a reasonably exogenous and robust predictor of the growth of immigrants' inflows. Therefore, we perform an IV/2SLS approach, using as instrument the so-called "shift-share" variable (described in detail in the next section).

#### **4. Data and Descriptive Analysis.**

In this section, we provide information on the sources used to construct the final dataset and describe in detail how the variables used in the empirical model are defined. In addition, we present the results of the descriptive analysis that shed some preliminary light on the relation between the immigrants and natives' employment growth in the Italian regions.

##### **4.1 Data Source and Variable Description.**

In order to compute the variables used in the study, two main data sources have been used. Information about the Italian population, both natives and foreign-born individuals, are taken from the National Statistic Office of Italy (ISTAT). More precisely, official data on resident population are computed using information provided by the Population Register Offices (Uffici di Anagrafe, in Italian) of each Italian region. Information on natives' employment are, instead, drawn from the microdata files of the Labor Force Survey (LFS), carried out by the National Statistic Office on a quarterly basis. It allows computing the main magnitudes of the aggregate Italian labor markets (e.g. employment status, type of job, job search, etc.), disaggregated by gender, age, citizenship and geographical scope (up to the regional level<sup>21</sup>).

Three years have been considered for the main analysis of the paper: 2006, 2011 and 2016, This has allowed us to compute the changes in native employment and immigrant population over five-years periods. For the robustness checks analysis, we have instead considered three-year gaps, and, therefore, the following years: 2007, 2010, 2013 and, again, 2016. In both cases, since the information on the resident population are relative to the first of January of every year, in order to obtain a more homogeneous dataset, we have considered the first quarter wave of the LFS of every year.

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<sup>21</sup> Recently, the public files of the LFS have been uploaded with information about the Province of residence. Unfortunately, this information is available only starting from the first quarter of 2016.

Since the objective of the paper is to disentangle (if any) the effects of immigration on natives' labor market outcomes, we have only considered, for both Italians and foreign-born individuals, the working age population<sup>22</sup>.

Italy is composed by 20 administrative regions. However, because of privacy issues, until the first quarter of 2016, Piemonte and Valle d'Aosta are pooled together and considered as a unique region. Therefore, for homogeneity purposes, in the present study we have always considered 19 regions with the previously mentioned ones together.

It is important to underline that the datasets so constructed have a few drawbacks. First of all, as underlined by Basso and Peri (2015), immigration is, to some extent and with only few exceptions, a smooth phenomenon. This means that usually migration flows follow a persistent and constant pattern over time, but they are characterized by small rates. Therefore, it would have been more appropriate to consider ten-year gaps, instead of five (or three, for the robustness checks). This procedure is usually done using census data. However, the National Statistic Office of Italy only provides the data for 2011 and 2001 censuses. In addition, they only give information on total employment, without distinguishing between immigrants and natives. The only freely available data source that allowed us to replicate Basso and Peri's (2015) analysis are the public LFS microdata, in which, unfortunately, information to identify natives and immigrants is only available from 2004 onwards<sup>23</sup>. Before 2004 information on the nationality (or, alternatively, on the citizenship) is confidential, and, therefore, not available. All these limitations have prevented us to construct the variables on an inter-decadal basis (like Basso and Peri did). In any case, it should be kept in mind that immigration in Italy is a slightly recent phenomenon, therefore it is not straightforward that considering years too distant in time would have contributed to improve the evidence to test the hypothesis in this study.

In addition, Basso and Peri (2015) in their study for the U.S. also analyze the association between the change in immigrant population and the change in natives' wages. However, the information needed for such analysis (i.e. wage for the natives in each Italian region) is not freely and readily available for Italy. Again, the short time period available to conduct this study has impeded us to

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<sup>22</sup> In Italy, the minimum legal age to start to work is 15 years, so we have considered individuals from 15 to 64 years of age.

<sup>23</sup> In order to address the problem, we have also contacted the National Statistic Office of Italy asking for more detailed data, but it has been not possible, due to the short time period available.

have access on these data on wage and therefore to analyze the effects of immigration on natives' earnings.

The dependent variable is the five-years change in the natives' employment, as share of the initial working age population in the region. More formally, the variable takes the following form:

$$\Delta(emp_{i,t})^{ITB} = \frac{(emp_{i,t+5}^{ITB} - emp_{i,t}^{ITB})}{pop_{i,t}} \quad (1)$$

where,  $\Delta(emp_{i,t})^{ITB}$  indicates the growth rate of the Italian born workers' employment, in region  $i$ , between the periods  $t$  and  $t+5$ . As previously mentioned, for the main analysis we have considered  $t=2006$ , 2011 and 2016. Therefore, the dependent variable indicates the natives' employment growth rates between 2006 and 2011, and between 2011 and 2016. For the robustness check analysis, instead, we have considered  $t=2007$ , 2010, 2013 and 2016. Therefore, the growth rates are between 2007 and 2010, 2010 and 2013, and, finally, 2013 and 2016. This choice allows us to include an additional time period in the analysis. Finally,  $pop_{i,t}$  indicates the working age population in region  $i$  at time  $t$ .

The main independent variable is constructed as to capture the growth rate of the immigrant population of every Italian region. More precisely, it takes the following form:

$$\Delta(immi_{i,t}) = \frac{(FB_{i,t+5} - FB_{i,t})}{pop_{i,t}} \quad (2)$$

where,  $FB_{i,t+5}$  indicates the number of foreign born individuals in working age in region  $i$ , five years after the baseline period and  $FB_{i,t}$  indicates the same but in the baseline year. As before,  $pop_{i,t}$  indicates the working age population in region  $i$  at time  $t$ . As for the robustness check analysis, both change in native employment and the change in immigrant population are computed considering three-years gaps.

In order to obtain more accurate result, we also carry out an alternative analysis, that considers the relationship between immigrants and natives within skill-location cells. More precisely, we define the skill-cells as the combination of four educational levels (low education, lower secondary education, upper secondary education or high school education and university) and two experience

levels (at least fifteen years of experience and more than fifteen years)<sup>24</sup>. In this second approach the dependent variable is slightly modified and takes the following form:

$$\Delta(emp_{i,k,t})^{ITB} = \frac{(emp_{i,k,t+5}^{ITB} - emp_{i,k,t}^{ITB})}{pop_{i,t}} \quad (3)$$

where the subscript  $k$  indicates the skill-cell.

As for the Bartik instrument, there are different ways in which it can be built (Baum-Snow and Ferreira, 2014). The most common are the so-called “price version” and the “quantity version”. The first one uses the wage growth rate that would have occurred in every single local labor market if the wage itself would have grown at the aggregate (i.e. national) rate. The latter is constructed in the same way, but using, instead of the wage the employment share of each industrial sector at some arbitrarily chosen baseline year. In this paper, due to the limitations in the data availability previously described, we have used the second version. More precisely, we have computed it in the following way:

$$\Delta Bartik_{i,t} = \sum_j (sh\_emp_{i,j,t_0} \Delta lnemp_{j,t}) \quad (4)$$

where  $sh\_emp_{i,j,t_0}$  indicates the employment share of each industry  $j$ , in region  $i$  in the baseline year (i.e.  $t_0=2006$  for the main analysis and  $t_0=2007$  for the robustness check). The baseline year is kept constant across all the sub-periods considered.  $\Delta lnemp_{j,t}$  indicates instead the change of the (logarithm of) employment, occurred in each industry  $j$  at time  $t^{25}$ , at the national level. For the definition of the different sectors we have used 99 industries disaggregation available in the microdata files of the LFS.

Finally, in the IV/2SLS approach, the instrument used is defined as a “shift-share” variable and is computed in the following way:

$$\Delta(\widehat{imm}_{i,t}) = \frac{(\widehat{FB}_{i,t} - \widehat{FB}_{i,t-5})}{(\widehat{FB}_{i,t-5} + \widehat{ITB}_{i,t-5})} \quad (5)$$

<sup>24</sup> Experience is defined as the amount of time, measured in months, that each individual has spent working. The variable has been constructed using the variable “DURATT” of the LFS.

<sup>25</sup> Where  $t= 2011$  and  $2016$ , for the main analysis and  $t= 2010, 2013$  and  $2016$  for the robustness checks.

where  $\widehat{FB}_{i,t} = \sum_c FB_{i,c,t_0} * \frac{FB_{c,t}}{FB_{c,t_0}}$ , the subscript  $c$  indicates immigrants' nationalities and  $t_0$  indicates the initial year. For the main analysis, we have chosen  $t_0=2001$ , while for the robustness checks  $t_0=2004$  ( $t=3$  in this case). Finally,  $ITB$  indicates the Italian born individuals in region  $i$  and at time  $t-5$ .

#### 4.2 Descriptive Analysis.

As preliminary evidence of the link between the change in the number of immigrants and the change in the employment of the natives in the Italian regions in the last decade, this section presents some descriptive statistics of the main variables under analysis. First of all, Table 1 summarizes the time trends of the main variables. As for the change in natives' employment, it is observed that, considering the entire period between 2006 and 2016, when pooling together all workers, the variable present a negative sign. This means that, in the period considered, natives have experienced a decrease in employment. This result is consistent with that reported in previous studies for the Italian economy, that underline the decline in the labor market performance caused by the financial crisis. However, it is important to indicate that Table 1 shows that the most damaged were the unskilled native workers, with a decline in employment of around 0.95%<sup>26</sup>. The high skilled natives were less affected from the crisis since their change in employment present a positive sign (0.39%). The same pattern is found considering the five-years changes, between 2006 and 2011, and 2011 and 2016. As for the change in the immigrant population, considering the decade 2006-2016, the variable present a positive sign. As stated in the introduction, this is consistent with the increase in immigrants' inflows occurred in that period. Analogously, in both five-years periods 2006-2011, and 2011-2016, the migratory flows followed a positive pattern<sup>27</sup>. It is important to underline, though, that in the period between 2011 and 2016 the rate of change presents a reduced magnitude, indicating that Italy was very often not the final destination country but just a sort of gate towards Central and Northern Europe. Table 1 also highlights some sort of disparities in the regional pattern of the variables considered. In the case of the change in the native employment, in fact, both considering the whole population and the sample of high-killed individuals, the variable displays a high degree of variability between regions. The same trend is found in the case of the

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<sup>26</sup> These results are somehow expected, since low skilled workers represent the weakest group in terms of labor security, and are likely to be the most affected individuals during a crisis.

<sup>27</sup> Those years were indeed characterized by the so-called "Arab Spring", that caused huge migratory flows towards Europe from Northern African and Middle Eastern countries. Alongside, significant migratory flows arrived from those countries that entered the European Union in the 2000's.

change in immigrant population. Conversely, the change in employment for low-skilled natives seems to follow a more homogeneous pattern across the Italian regions.

In order to have a geographical visualization of the variables involved in the analysis, we also present some maps of both variables. Figure 1 shows the change in the immigrants' share, across the Italian regions relative to the period 2006-2011<sup>28</sup>. Observing the map, it is possible to notice that the higher values of the variable are found in the Northern and Central regions<sup>29</sup>. Figure 2 presents instead the map of the change in natives' employment (for all workers) relative to the same period of time. The first thing to notice is that, with few exceptions (Emilia Romagna and Umbria above all), the variable seems to follow a different pattern with respect to the previous case. The highest values are found in the North East (Trentino Alto Adige and Veneto), and in the Center (Lazio and Sardinia). The North West (with the exception of Liguria) and the South present instead low values.

Figure 3 shows the change in natives' employment, relative to the years 2006-2011, in the case of the low-skilled workers. The map highlights that the higher values of the variable are found in some Central and Northern (both North-East and North-West) regions, together with few Southern ones (namely Molise, Puglia and Sicily). In turn, Figure 4 represents the change in employment relative to the same period but only for highly-educated natives. The higher values of the variable are found in the Northern (especially North-east) and Central regions (together with Sardinia).

Figure 5 to 8 show the same map relative to the period 2011-2016. The one for the change in immigrants' share of the population shows that the higher values are clustered in Central and Southern regions, with the exception of Lombardy. This figure represents quite clearly the recent inflows of foreign-born individuals occurred in the South of Italy in the last few years. Figure 6, 7 and 8 represent, instead, the change in natives' employment, relative to the same period and for the different type of individuals, all workers, low skilled and high-skilled ones, respectively. In the first figure, the higher values are clustered in the regions that form the central axis that connects the North and the South of the country. In Figure 7, instead the higher values of the variable are found in some Northern regions, namely Lombardy and Trentino Alto Adige and in some Central and Southern ones. Finally, Figure 8 clearly shows that the higher change in natives' employment has occurred between 2016 and 2011 in the North and Center of Italy.

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<sup>28</sup> Maps relative to the decadal changes 2006-2016 are available in the appendix.

<sup>29</sup> Emilia-Romagna, Umbria and Lazio are the regions characterized by the higher values, followed by Lombardy and Tuscany.

While they are interesting because they allow a geographical visualization of the phenomenon analyzed, the maps do not help us to disentangle the relationship between the variable involved. Therefore, in order to obtain some initial evidence, we present several scatterplots. Initially we show the scatterplot that considers the relation between the change in natives' employment and the change in the foreign-born individuals as a share of the population at the beginning of the five-year periods. Following Basso and Peri (2015), we have subtracted from each variable the time averages. This allows us to obtain a "cleaner" visualization of the phenomenon. The geographical units of observation are the Italian regions over the five-year time periods. The diameters of the circles in the figures are proportional to the total population in each region.

Figure 9 presents the correlation between the change in the immigrant population and the change in natives' employment, relative to all workers (i.e. without distinguishing by level of education) in the decade 2006-2016. The graph clearly shows a positive correlation between the two variables. The coefficient of the simple regression is statistically significant at 5% level<sup>30</sup> and is quite large in magnitude (0.41). This implies that an increase of 10 percentage points in the immigrants' share is associated with an increase of around 4 percentage points in natives' employment.

Figure 10 shows instead the relationship between immigrants and natives' employment, but just for the low-skilled individuals (i.e. with less than a university degree). Again, the graph indicates a positive correlation between the two variables, although, the simple regression presents a non-significant coefficient. Finally, Figure 11 indicates the same relation but for natives holding at least a bachelor degree. Even in this case the correlation is positive and the coefficient of the simple regression is strongly significant (at 1% level)<sup>31</sup>.

## 5. Results.

Further evidence on this relationship applying the empirical strategy sketched in section 3 is obtained in the following section. In this section, we first discuss the results of the main analysis and then we perform and comment some robustness checks.

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<sup>30</sup> At 10% in the case of standard errors clustered by region.

<sup>31</sup> The coefficients of the simple correlations, together with their (robust) standard errors are reported in the notes below each scatterplot.



## 5.1 Main Analysis.

Before presenting the evidence obtained for the more sophisticated specifications discussed in section 3 and by using the instrumental variable approach, we show the results of the simple regression analysis.

Table 2 presents the results of the estimation of the regression between the change in immigrant population and the change in total native employment across Italian administrative regions, as presented in equation 1. The first column presents the estimation carried on adding only year fixed effects, while in column two we also include region fixed effects. In both cases, the coefficient associated to the change in native employment is positive. In the first estimation, it is also significant at 5% level, while in the second, it is not significant at the standard levels. This implies that, when adding both regional and time fixed effects, the change in immigrant population is not anymore correlated with natives' employment levels. This result is consistent with the findings of Basso and Peri (2015) for the U.S.

In a further step, we divide the population of native workers into two categories, according to their educational attainments. We then consider again the correlation between these two categories of workers and the change in immigrant population. The results are presented in Table 3. Again, in column 1 and 3 we add only year fixed effects, while in column 2 and 4 we also include regional fixed effects. The results are analogous to the ones of Table 2. More precisely, the coefficients estimated relative to the association between immigrants and low-educated individuals are positive, but not significant at any level. As for highly-educated individuals, when we add year fixed-effects, the coefficient is significant and again positive. This implies that immigrants act, to some extent, as complementary with respect to high-skilled native workers<sup>32</sup>. When instead adding both year and region fixed effects, the coefficient become negative, but loses its significance. Like in Basso and Peri's (2015) paper, these preliminary results indicate, overall, the absence of any displacement effect of immigrants towards natives.

As already explained, the coefficients estimated so far indicate what the previous literature has defined as *average effects*. They are somewhat informative of the correlation between immigrants and natives' labor market performances, but they do not represent a clear-cut picture of the actual economic impact of foreign-born workers. In order to address the issue, we estimate a set of regressions, as expressed in equation 2. The results are presented in Table 4. The coefficient

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<sup>32</sup> These results are consistent with both theoretical and empirical findings of the previous literature (see, for instance Dustmann, et al., 2008).

associated to the change in immigrant population is supposed to measure the *spatial correlation*, between immigrants and native employment, as indicated by Borjas (2014). As can be observed, none of the coefficients reported in the table are significant at the usual levels. This allows us to affirm the absence of any spatial correlation between the change foreign-born workers and natives' employment. In other words, Table 4 indicates that immigrants exert no impact over domestic workers' employment levels. These results imply that within-cells labor supply shocks caused by immigrants' inflow are not associated with a phenomenon of displacement for native workers<sup>33</sup>.

As already indicated, when measuring the dynamics of employment, it is important to control for demand shocks. Therefore, we introduce in our specification the so-called "Bartik" instrument, as indicated in equation 3. The underlying idea is to capture a possible labor demand growth occurred in the period under analysis, that can have influenced natives' employment levels. We initially carry-out the regression for all native workers. The results of the estimation are presented in Table 5. The first column shows the results when adding year fixed effects. The coefficient associated to the change in immigrant population is positive and significant at 5% level. The coefficient of the Bartik instrument is instead negative but not significant. In column 2 we add region fixed effects only. The coefficients estimated are now not significant anymore. We then divide the population under analysis in two samples composed by low and high-educated workers (as defined previously), and we perform again the estimation of equation 3. Table 6 reports the results. As for low-skilled individuals (columns 1 and 2), the coefficients estimated are not significant. In the case of highly educated individuals, column 3 presents the results of the estimation including only year fixed effects. Both the coefficients associated to the change in immigrant population and to the Bartik instrument, are positive. In addition, the first is significant at 1% level, and the second at 10%. However, when adding also region fixed-effects, the estimated coefficients lose precision and became not significant. Overall, it is possible to conclude that, even adding a proxy for the labor demand growth (i.e. the Bartik instrument), immigrants seem not to exert any significant impact over the natives' employment.

The results presented so far have been obtained under the assumption that the growth of the immigrant population is exogenous. As discussed in section 3, this assumption can be easily contradicted<sup>34</sup>. In other word an alternative estimation method should be used if we want to get

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<sup>33</sup> To a certain extent, these findings are consistent with the results for the U.S. in Basso and Peri (2015).

<sup>34</sup> For more details relative to the causal inference in labor economics, see Angrist and Krueger (1999), Angrist and Pischke (2008), Baum-Snow and Ferreira (2014).

information about the causal effect of immigration on the employment of the natives in the Italian regions. A popular way to do it is to use an Instrumental Variable (IV) approach, as described in section 3. In Table 7, we report the results when using the “shift-share” instrument. The first thing to notice is that the instrument is highly correlated with the change in immigrant population: the First-Stage F-statistic is indeed 27027.22, suggesting that is very strong. Column 1 shows the outcomes of the Two-Stage-Least-Square approach relative to the whole population of native workers. The coefficient associated to the change in immigrant population is positive, but not statistically significant. The same pattern is found in columns 2 and 3, that report the estimates relative to low and highly-skilled individuals. The coefficient of interest is indeed again positive but not statistically significant. These results are consistent both with the hypothesis of this study and with Basso and Peri’s (2015) findings for the U.S. Specifically, they indicate that immigrants do not alter the employment levels of the native population.

It is important to underline, though, that these results should be interpreted with caution. Basso and Peri (2015) highlight in fact that it is not possible to be completely sure that the distribution of the foreign-born individuals in periods following 2001 (which is the baseline year used to construct the instrument), is fully exogenous with respect to changes in the labor markets (namely demand shocks). Demand shocks occurred at the regional level can indeed show a degree of persistence and this can have encouraged immigrants to settle in regions offering better working conditions.

Finally, we include in the IV/2SLS regression the Bartik Instrument. The results are presented in Table 8. As before, column 1 is relative to the whole native population, while columns 2 and 3 show the estimates for low and high skilled individuals, respectively. The results are consistent with the previous ones. Again indeed, the coefficient associated to the change in immigrant population is positive. In addition, it is statistically significant at 5% level when considering the whole native population and at 1% in the case of high-educated workers. While it is not significant in the case of low-skilled individuals. As for the Bartik instrument, its coefficient is significant only in the case of high-skilled natives, but it is close to zero.

## 5.2 Robustness Checks.

As already indicated, in order to foster the results obtained, we perform a robustness checks analysis. Specifically, we use the same econometric approach and variables as described in sections 3 and 4, respectively, but we change the time frame. More precisely, we consider three-years gaps instead of five. Therefore, we carry on our analysis for 2007, 2010, 2013 and 2016.

Here we present the results obtained, that, overall, are in line with the main analysis. Table 9 presents the estimates of the correlation between the change in the immigrant population and the change in natives' employment. Columns 1 and 2 are relative to the whole native population, columns 3 and 4 report the estimates only for low-skilled workers and columns 5 and 6 for high-skilled. The results are consistent with the main analysis (the corresponding tables of the main analysis are Tables 2 and 3): the correlation between the growth rate of immigrant population and the natives' employment is positive or null.

Table 10 presents the estimates relative to the education-experience cells approach. With respect to the main analysis (see Table 4 for comparison), in this case column 4 (i.e. when adding region-year, region-skill and skill-year fixed effects) presents a negative and significant coefficient associated to the change in immigrant population. This suggests that there may be some sort of displacement effect between immigrants and natives, within skill cells.

In order to control for potential labor demand shock that can influence natives' employment levels, we include in the list of regressors the "Bartik" instrument, as specified in equation 3. The results are presented in Table 11. The first two columns present the results relative to all workers, column 3 and 4 the ones for the low-educated individuals and the last two the estimates for highly-skilled workers. The coefficients associated to the change in immigrant population are consistent with the main analysis: they are all positive although some of them not significant (specifically, for the low and the high skilled workers when both year and region dummies are included). The coefficient associated to the Bartik instrument is not significant in almost all specifications, except for column 6 in which it is significant at 5% level and with negative sign. However, it is also important to underline that the magnitude of the coefficient is close to zero. This implies that the decline in natives' employment is only in a small part provoked by a reduction in the labor demand.

Then, Table 12 present the results for the IV/2SLS approach. We consider the whole native population in column 1, while in columns 2 and 3 we divide it into two sub-samples defined in terms of educational attainments. The instrument is, again, very strong (the F-statistic of the First-Stage is 21233.72). In addition, the coefficients reported in the first two columns are positive and statistically significant (at 1% the first, and at 10% the second). In the case of high-skilled workers, conversely, the coefficient associated to the change in immigrant population is not statistically significant. This implies that the results confirm those of the main analysis and indicate positive or null effect of immigration on the native employment.

It is important to stress that, when considering changes of three years in the variables under

analysis, the results show more significant and large positive effects of immigrants on the natives' employment.

Finally, Table 13 shows the results relative to the inclusion of the Bartik control in the IV regression. The results confirm the findings of the main analysis. The coefficient of interest is positive and statistically significant at 10% level (column 3) or not significant. The coefficient associated to the Bartik control is positive and significant in columns 1 and 2 (at 10% and 1%, respectively) and not significant in the last one. In all cases, however, its magnitude is reduced (i.e. it is close to zero).

### 5.3 Discussion of the Results.

To conclude this section, it is important to underline that the theory of the economics of immigration affirms that immigrants exert a negative impact over host countries' labor markets, only when they modify the initial skill composition of their labor forces (see Dustmann et al., 2006). To this extent, Table 14 present the skill composition of both natives and immigrant workers in Italy in 2006, 2011 and 2016. Observing the table, it is possible to notice that overall the only considerable difference is found for the first and the second educational levels (i.e. people with primary and lower secondary education, respectively). However, immigrants are often characterized by the phenomenon of the "less-than-perfect-substitutability" between educational attainments (see, to this extent, Fullin and Reyneri, 2011). In other words, the educational achievement obtained by immigrants tend to be somehow under-graded, once they move abroad. This implies then that it is reasonable to assume that individuals with lower secondary education are considered as if they only had primary education, and so on. If we take into account this phenomenon, then, Table 14 shows that immigrants and natives are characterized by almost the same skill composition. It is therefore logical to expect, as we found, that immigrants do not exert a negative impact on the natives' employment, when entering the Italian labor force.

## 6. Conclusions.

The last decade has been characterized in Italy by two important facts. First of all, the economic downturn caused by the global financial crisis and by the European sovereign debt crisis. These events have produced an unprecedented deterioration of the labor market performances of the population. At the same time, Italy has changed its role, from immigrant-sending to immigrant receiving-country. The political turmoil that has characterized Southern and Eastern borders of the Mediterranean Sea in the last few years, has caused an unexpected increase of immigration inflows.

Because of its strategic geographical position, Italy has rapidly become one of the major destinations.

Since the beginning of the migratory inflows in the early nineties, the issue of immigration has been a central topic in the socio-political context of Italy, and the last developments have flared-up again the debate. Alongside, the economics of immigration has been a central argument of debate in the academic world, too. Many studies have analyzed the issue, with contrasting results. Some researchers have developed a more positive vision of immigration, claiming that foreigners have a positive or null impact in host countries' labor markets. Others disagree with this vision and argue that immigrants can cause a decline in both natives' wages and employment levels.

In such a scenario, we have decided to carry-out an empirical exercise that allows to test what is the actual impact of immigration into Italian labor markets. Specifically, we have analyzed the impact of immigration on the natives' employment. Using the informations of the Italian Labor Force Survey (LFS), we have constructed a dataset relative to the period 2006-2016, that has allowed us to replicate, for the Italian context, the approach used by Basso and Peri (2015) for the U.S. Following different empirical approaches, we have initially performed some aggregate correlation between the change in immigrant population and the change in native employment. We have both considered the whole population of Italian workers and then we have divided it into two samples according to their educational attainments (namely high and low-skilled individuals). We have then divided the native population into eight different skill-cells, that are composed by four educational levels and two experience levels and then performed a set of regressions relative to the correlation between immigrants and natives' employment, within skill-region cells. Overall, the estimations show positive or negligible correlations.

Subsequently, following Basso and Peri (2015), we have introduced in the baseline estimation a control variable, namely the so-called "Bartik" instrument. This procedure allows to capture the possible labor demand shocks, that can have influenced the dynamics of native employment, in the period under analysis. Again, we estimated the regressions with the Bartik control for the whole population and for the two samples of low and highly educated natives. Even in this case, though, the coefficients estimated for the change in immigrant population are positive or not statistically significant. As for the coefficients associated for the Bartik instrument, they are all not statistically significant, except in the estimation relative to high-skilled individuals, when adding only time fixed-effects<sup>35</sup>.

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<sup>35</sup> Although, the magnitude of the coefficient is close to zero.

Then, in order to address the endogeneity issue, we have carried-out an instrumental variable approach, using the so-called “shift-share” instrument. Overall, the results of the IV/2SLS approach indicate the absence of any impact of immigrants over the employment levels of the native population. In addition, the same results are found both considering the whole native population and when we divide it into two groups that differ in terms of educational attainments. It is important to underline, though, that these results should be interpreted with caution. As indicated by Basso and Peri (2015) for the U.S., one cannot be completely sure that the distribution of foreign-born individuals in period successive to 2001 (which is the baseline year used to construct the instrument), is fully exogenous with respect to changes in the labor markets. Demand shocks occurred at the regional level can indeed show a degree of persistence and this can have encouraged immigrants to settle in regions offering better work conditions.

Finally, we have performed an estimation introducing the Bartik control in the IV/2SLS regression. The results indicate again a positive or null impact of immigrants on the natives’ employment.

In general terms, therefore, we are in favor of affirming that immigrants do not seem to displace native workers. This conclusion, is also in accordance both with Basso and Peri’s (2015 analysis and with the literature on the impact of immigration in the Italian labor market. The possible reasons behind this result are different. First of all, the paradigm of perfect substitutability between immigrant and native workers could not hold. As pointed out by different studies (see, for instance, Ottaviano and Peri, 2012), immigrants and natives, even characterized by analogous educational attainments, tend to be employed in different occupations. Overall, usually immigrants are more advantaged in low-skilled, mostly manual type of jobs, while native tend to specialize in communication-intensive jobs<sup>36</sup> (see Peri and Sparber, 2009). This somehow indirect division of tasks is therefore associated with a rise in total productivity. This phenomenon causes, in turn, an increase in labor market outcomes for both the native and foreign born. These findings reflect a situation in which the Italian economy has been able, despite the crisis, to absorb the recent migratory inflows, and yet generate a positive demand of labor.

The results obtained have also interesting policy implications. According to the National Statistic Office, the average age of the Italian population is constantly increasing and, simultaneously, the natural population change is negative. In such a scenario, the degree of resilience of the Italian social security system is doomed to fail in the near future. However, If, as it emerges from this study,

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<sup>36</sup> Especially because of a better knowledge of the language.

immigrants do not displace native workers, their integration into the Italian economy could represent a valid solution to this problem.

This study certainly presents some drawbacks and limitations. First of all, the choice of the time period is objectionable. Basso and Peri (2015) indicate that, when analyzing the relation between the growth rates of native employment and immigrant population, the best approach is to consider inter-decadal changes. The phenomenon of immigration is usually slow but constant over time, and one can rarely observe abrupt changes that consistently modify the composition of the population in short time-frames. However, this can be valid for a longstanding country of immigration like the United States. In Italy, instead, immigration is a somewhat recent phenomenon. The composition of Italian population in the last decade has undergone sudden and unprecedented changes. In addition, research on the United States reality is made somehow easier by the richness and diversity of information that are freely available<sup>37</sup>. Unfortunately, this is not valid for Italy. Therefore, an extension of the time frame can only be left to a future research project. If one wants to present a general simplification of the empirical research in labor economics, it is possible to say that it involves both quantities (i.e. the number of employed people) and prices (i.e. wages). In this study, we have only analyzed the first element. However, in order to have a broader overview of the labor market impact of immigration, it would be appropriate to also perform an analysis on wages' dynamics (like the vast majority of published studies do). Again, though, freely available information on Italian wages are considerably limited and this makes this kind of analysis more difficult and time-demanding.

Finally, the analysis conducted in the present paper is carried-out at the aggregate level. A good integration could be a study at the micro-level, and therefore to test if the findings obtained can be transferred at the individual level.

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<sup>37</sup> Just think on the IPUMS project, that freely provides census and survey data both relative to the U.S. and to other different countries.



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**Table 1.**  
**Summary statistics of the main variables under analysis.**

Changes in natives' employment									
	2006-2016			2006-2011			2011-2016		
	Italy	Min	Max	Italy	Min	Max	Italy	Min	Max
All workers	-0.565	-0.081	0.015	-0.297	-0.049	0.022	-0.265	-0.054	0.011
High-Skilled	0.391	0.001	0.059	0.150	-0.004	0.027	0.238	-0.005	0.040
Low-Skilled	-0.956	-0.115	-0.013	-0.448	-0.047	0.007	-0.502	-0.069	-0.003
Changes in immigrant population									
	2006-2016			2006-2011			2011-2016		
	Italy	Min	Max	Italy	Min	Max	Italy	Min	Max
Immigrants	0.046	-0.043	0.084	0.038	-0.053	0.062	0.008	-0.006	0.021

*Note: min and max refer to the values for the variable in the region-year with the minimum and maximum values.*

**Table 2.**  
**Correlation between change in immigrant population and change in total native employment.**  
 Aggregate region regression, period 2006-2016.

VARIABLES	(1)	(2)
change in immigrant population	0.411** (0.175)	0.306 (0.403)
Observations	38	38
R-squared	0.152	0.422
Year FE	YES	YES
Region FE	NO	YES

**Note:** Variables are expressed in five-years changes. The dependent variable is the change in native employment as share of initial population, while the change in immigrant population as share of initial population is the explanatory one. The unit of observation are the Italian administrative regions. Regressions are weighted by the total number of individuals in the region at the beginning of the period. Robust standard errors are indicated in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 3.**  
**Correlation between change in immigrant population and change in native employment, by schooling groups.**  
 Aggregate region regressions, period 2006-2016.

VARIABLES	Low-Skilled		High-Skilled	
	(1)	(2)	(3)	(4)
change in immigrant population	0.147 (0.134)	0.381 (0.244)	0.264*** (0.094)	-0.0750 (0.187)
Observations	38	38	38	38
R-squared	0.060	0.444	0.207	0.607
Year FE	YES	YES	YES	YES
Region FE	NO	YES	NO	YES

*Note: Variables are expressed in five-years changes. The dependent variable is the change in native employment as share of initial population. We distinguish between two schooling groups: low and high-skilled individuals. The change in immigrant population as share of initial population is the explanatory variable. The unit of observation are the Italian administrative regions. Regressions are weighted by the total number of individuals in the region at the beginning of the period. Robust standard errors are indicated in parentheses.*

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 4.**  
**Correlations between change in immigrant population and change in native employment.**  
 Partial region-skill regressions, period 2006-2016.

VARIABLES	(1)	(2)	(3)	(4)
change in immigrant population	0.0538 (0.0624)	0.0626 (0.0756)	0.0520 (0.0867)	-0.102 (0.141)
Observations	302	302	302	302
R-squared	0.653	0.748	0.830	0.849
Year FE	YES	YES	NO	NO
Region FE	YES	NO	NO	NO
Skill FE	YES	YES	NO	NO
Region-Year FE	NO	NO	NO	YES
Region-Skill FE	NO	YES	YES	YES
Year-Skill FE	NO	NO	YES	YES

*Note: The units of observations are cells at the administrative Italian regions by skill. Skills are defined as four education levels by two experience group. Variables are expressed in five-years changes. The change in native employment as share of the initial total population represents the dependent variable, while the change in immigrant population as share of initial population the explanatory one. Regressions are weighted by the total number of individuals in the cell (defined as region x skill group) at the beginning of the period. Standard errors are clustered at the regional level and indicated between parentheses.*

**Table 5.**  
**Immigration and native employment.**  
**Including "Bartik" instrument for changes in labor demand - All workers.**  
**Aggregate region regressions, period 2006-2016.**

VARIABLES	(1)	(2)
change in immigrant population	0.410** (0.175)	0.304 (0.415)
Bartik instrument	-3.98e-05 (0.000328)	5.72e-05 (0.000530)
Observations	38	38
R-squared	0.153	0.422
Year FE	YES	YES
Region FE	NO	YES

**Note:** The units of observations are the Italian administrative regions. Variables are expressed in five-years changes. The change in native employment as share of the initial total population represents the dependent variable. As additional control, we add the "Bartik" instrument, that captures changes in the labor demand side. Regressions are weighted by the total number of individuals in the region at the beginning of the period. Robust standard errors are indicated between parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 6.**  
**Immigration and native employment.**  
**Including “Bartik” instrument for changes in labor demand, by schooling groups.**  
**Aggregate region regressions, period 2006-2016**

VARIABLES	Low-Skilled		High-Skilled	
	(1)	(2)	(3)	(4)
change in immigrant population	0.137	0.394	0.272***	-0.0906
	(0.123)	(0.252)	(0.0927)	(0.186)
Bartik instrument	-0.000298	-0.000414	0.000258*	0.000471
	(0.000247)	(0.000413)	(0.000147)	(0.000371)
Observations	38	38	38	38
R-squared	0.085	0.471	0.228	0.646
Year FE	YES	YES	YES	YES
Region FE	NO	YES	NO	YES

**Note:** The units of observations are the Italian administrative regions. Variables are expressed in five-years changes. The change in native employment as share of the initial total population represents the dependent variable. As additional control, we add the “Bartik” instrument, that captures changes in the labor demand side. Regressions are weighted by the total number of individuals in the region at the beginning of the period. Robust standard errors are indicated between parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .



**Table 7.**  
**Immigration and native employment, IV using the "shift-share" instrument.**  
 Aggregate region regressions, period 2006-2016.

VARIABLES	(1) All Workers	(2) Low-Skilled	(3) High-Skilled
change in immigrant population	0.153 (0.0996)	0.130 (0.0862)	0.022 (0.686)
Observations	38	38	38
F-statistic First Stage	27027.22	27027.22	27027.22

*Note: The units of observations are the Italian administrative regions. Variables are expressed in five-years changes. In the first column, the dependent variable is the change in native employment for all workers. The second column is relative to natives with less than a bachelor degree, and the third column one is relative to individuals with, at least, a university degree. The method of estimation in each specification is a 2SLS using the shift-share instrument, construct using 2001 as baseline year. Regressions are weighted by the total number of individuals in the region, at the beginning of the period. Standard errors are clustered at the regional level and expressed in parentheses.*

**Table 8**  
**Immigration and native employment, IV using the "shift-share" instrument and Bartik control.**  
 Aggregate region regressions, period 2006-2016.

VARIABLES	(1) All Workers	(2) Low-Skilled	(3) High-Skilled
change in immigrant population	0.365** (0.184)	0.0974 (0.119)	0.267*** (0.0959)
Bartik instrument	0.000334 (0.000257)	-5.22e-05 (0.000187)	0.000386*** (0.000125)
Observations	38	38	38
R-squared	0.125	0.062	0.222
F-statistic First Stage	7658.42	7658.42	7658.42

*Note:* Variables are expressed in five-years changes. The dependent variable is the change in native employment as share of initial population, while the explanatory ones are the change in immigrant population as share of initial population and the "Bartik" instrument. The unit of observation are the Italian administrative regions. The method of estimation in each specification is 2SLS, using the shift-share instrument. The F-statistic of the first stage is reported in the last row. Regressions are weighted by the total number of individuals in the region at the beginning of the period. Standard errors clustered at the regional level are expressed in parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 9.**  
**Correlation between the change in immigrant population and the change in natives' employment.**  
 Aggregate region regressions, period 2007-2016.

VARIABLES	All Workers		Low-Skilled		High-Skilled	
	(1)	(2)	(3)	(4)	(5)	(6)
change in immigrant population	0.682*** (0.134)	0.761*** (0.188)	0.0825 (0.148)	0.278 (0.237)	0.600*** (0.192)	0.482* (0.248)
Observations	57	57	57	57	57	57
R-squared	0.540	0.690	0.356	0.555		0.
Year FE	YES	YES	YES	YES	YES	YES
Region FE	NO	YES	NO	YES	NO	YES

*Note: Variables are expressed in three-years changes. The dependent variable is the change in native employment as share of initial population, while the change in immigrant population as share of initial population is the explanatory one. The unit of observation are the Italian administrative regions. Regressions are weighted by the total number of individuals in the region at the beginning of the period. Robust standard errors are indicated in parentheses.*

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 10.**  
**Correlations between change in immigrant population and change in native employment.**  
 Partial region-skill regressions, period 2007-2016.

VARIABLES	(1)	(2)	(3)	(4)
change in immigrant population	0.0461 (0.0594)	0.0502 (0.0750)	0.0388 (0.0668)	-0.0241** (0.0107)
Observations	456	456	456	456
R-squared	0.333	0.479	0.541	0.798
Year FE	YES	YES	NO	NO
Region FE	YES	NO	NO	NO
Skill FE	YES	YES	NO	NO
Region-Year FE	NO	NO	NO	YES
Region-Skill FE	NO	YES	YES	YES
Year-Skill FE	NO	NO	YES	YES

**Note:** The units of observations are cells at the administrative Italian regions by skill. Skills are defined as four education levels by two experience group. Variables are expressed in three-years changes. The change in native employment as share of the initial total population represents the dependent variable, while the change in immigrant population as share of initial population the explanatory one. Regressions are weighted by the total number of individuals in the cell (defined as region x skill group) at the beginning of the period. Standard errors are clustered at the region level and indicated between parentheses.

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 11.**  
**immigration and native employment, including “Bartik” instrument for changes in labor demand**  
**Aggregate region regressions, Period 2007-2016.**

VARIABLES	All Workers		Low-Skilled		High-Skilled	
	(1)	(2)	(3)	(4)	(5)	(6)
change in immigrant population	0.699*** (0.139)	0.758*** (0.191)	0.0808 (0.150)	0.282 (0.271)	0.618*** (0.198)	0.476 (0.298)
Bartik instrument	-0.000384 (0.000256)	-0.000412 (0.000362)	4.08e-05 (0.000254)	0.000586 (0.000407)	-0.000425 (0.000259)	-0.000998** (0.000463)
Observations	57	57	57	57	57	57
R-squared	0.553	0.701	0.356	0.583	0.277	0.499
Year FE	YES	YES	YES	YES	YES	YES
Region FE	NO	YES	NO	YES	NO	YES

*Note: The units of observations are the Italian administrative regions. Variables are expressed in three-years changes. The change in native employment as share of the initial total population represents the dependent variable. As additional control, we add the “Bartik” instrument, that captures changes in the labor demand side. Regressions are weighted by the total number of individuals in the region at the beginning of the period. Robust standard errors are indicated between parentheses.*

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 12.**  
**Immigration and native employment, IV using the "shift-share" instrument**  
**Aggregate region regressions, Period 2007-2016.**

VARIABLES	All Workers (1)	Low Skilled (2)	High-Skilled (3)
change in immigrant population	0.315*** (0.113)	0.157* (0.085)	0.158 (0.140)
Observations	57	57	57
F-statistic First Stage	21233.72	21233.72	21233.72

*Note: The units of observations are the Italian administrative Regions. Variables are expressed in three-years changes. The change in native employment as share of the initial total population represents the dependent variable, while the change in immigrant population as share of initial population the explanatory one. The method of estimation in each specification is 2SLS, using the shift-share instrument. The F-statistic of the first stage is reported in the last row. Regressions are weighted by the total number of individuals in the region at the beginning of the period. Standard errors are clustered at the regional level and reported between parentheses.*

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 13.**  
**Immigration and native employment, IV using the "shift-share" instrument and Bartik control.**  
**Aggregate region regressions, period 2007-2016.**

VARIABLES	(1) All Workers	(2) Low-Skilled	(3) High-Skilled
change in immigrant population	0.129 (0.175)	-0.185 (0.121)	0.315* (0.180)
Bartik instrument	9.28e-05* (5.41e-05)	0.000171*** (3.56e-05)	-7.84e-05 (5.49e-05)
Observations	57	57	57
R-squared	0.146	0.251	0.083
F-statistic First Stage	14985.69	14985.69	14985.69

**Note:** Variables are expressed in three-years changes. The dependent variable is the change in native employment as share of initial population, while the explanatory ones are the change in immigrant population as share of initial population and the "Bartik" instrument. The unit of observation are the Italian administrative regions. The method of estimation in each specification is 2SLS, using the shift-share instrument. The F-statistic of the first stage is reported in the last row. Regressions are weighted by the total number of individuals in the region at the beginning of the period. Standard errors are clustered at the regional level and expressed in parentheses.

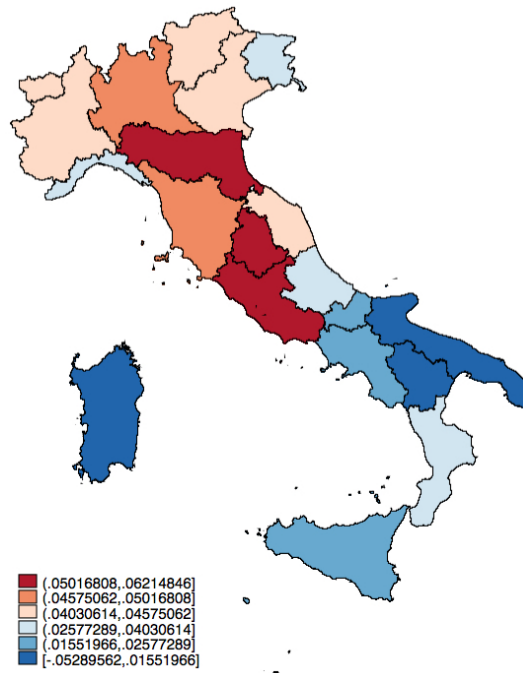
\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table 14.**  
**Immigrants and Natives skills composition.**

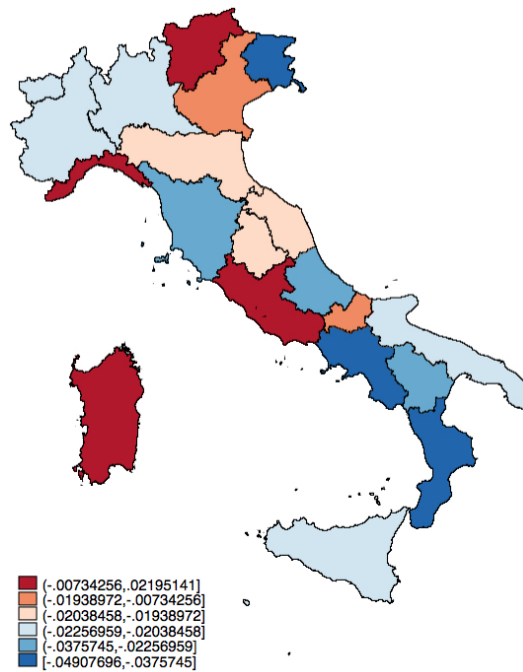
2006				
	Primary Education	Lower Secondary Education	Upper Secondary Education	University
Immigrants	0,1381	0,3762	0,3796	0,1061
Natives	0,2774	0,3110	0,3178	0,0937
2011				
Immigrants	0,1220	0,3652	0,4116	0,1013
Natives	0,2385	0,3151	0,3360	0,1103
2016				
Immigrants	0,0918	0,3935	0,3942	0,1205
Natives	0,1991	0,3137	0,3531	0,1341



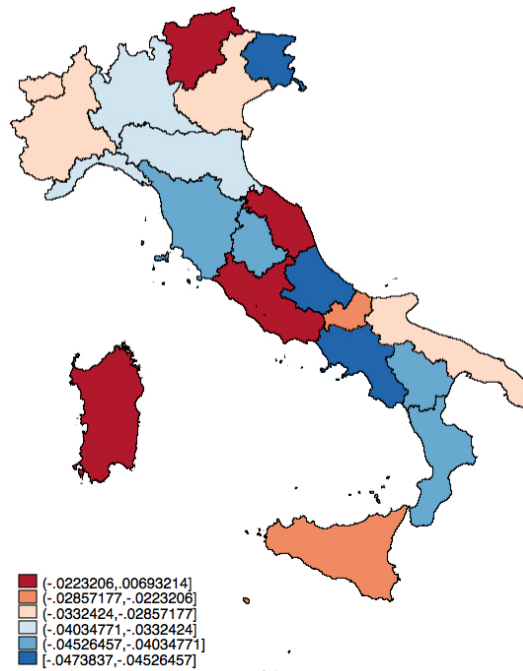
**Figure 1.**  
**Change in immigrant population.**  
**Administrative Regions, period 2006-2011**



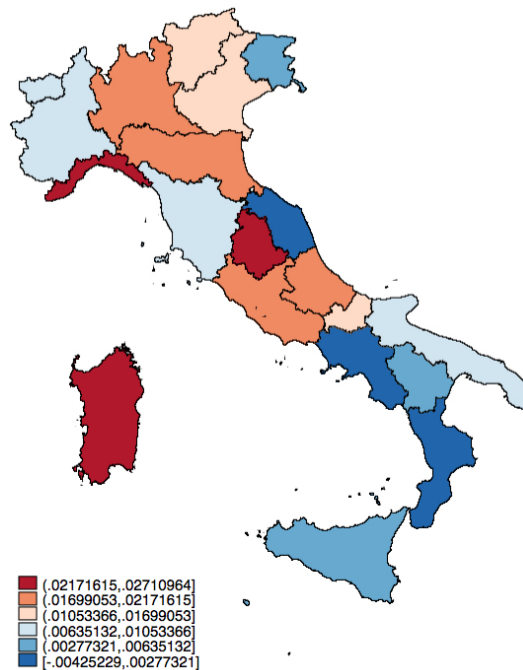
**Figure 2.**  
**Change in native employment - All workers.**  
**Administrative Regions, period 2006-2011.**



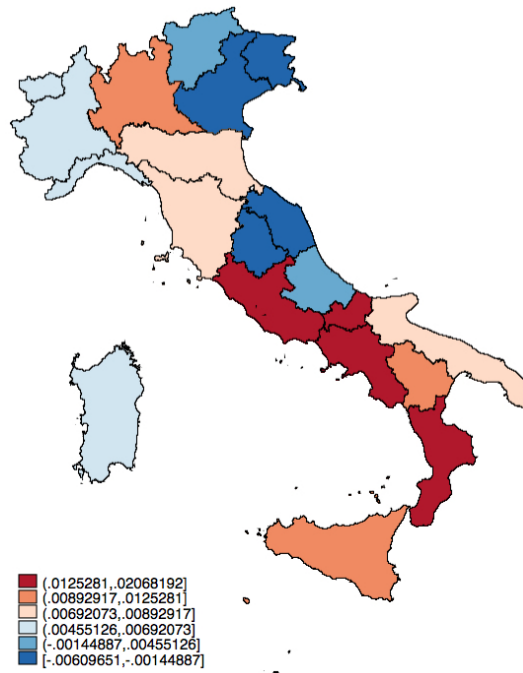
**Figure 3.**  
**Change in native employment - Low-Skilled.**  
 Administrative Region, period 2006-2011.



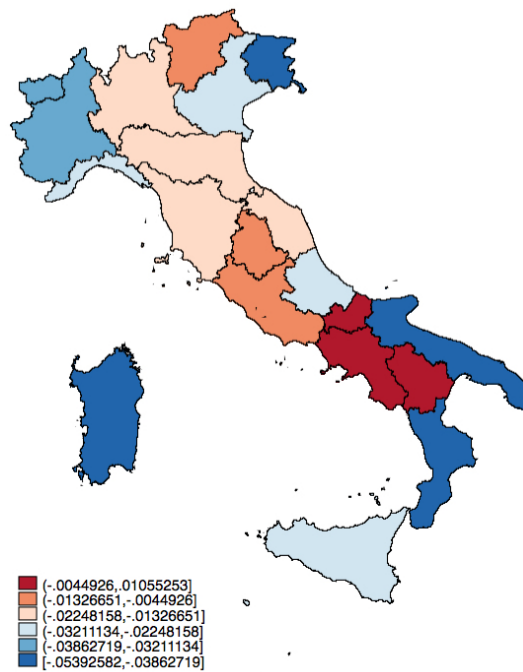
**Figure 4.**  
**Change in native employment - High-Skilled.**  
 Administrative Region, period 2006-2011.



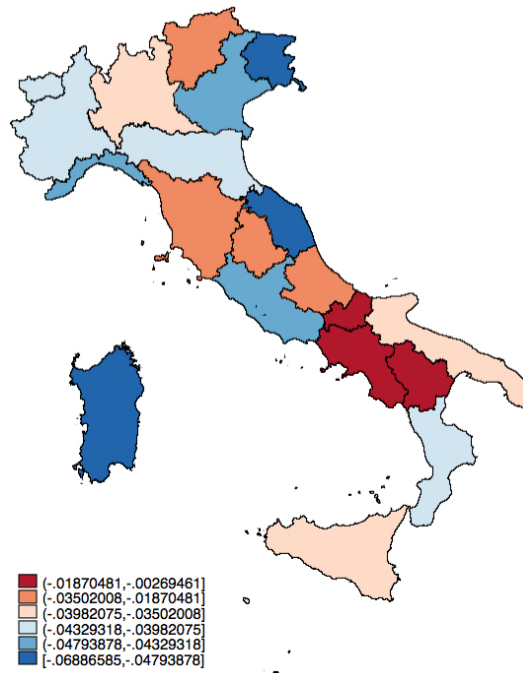
**Figure 5.**  
**Change in immigrant population.**  
**Administrative Regions, period 2011-2016.**



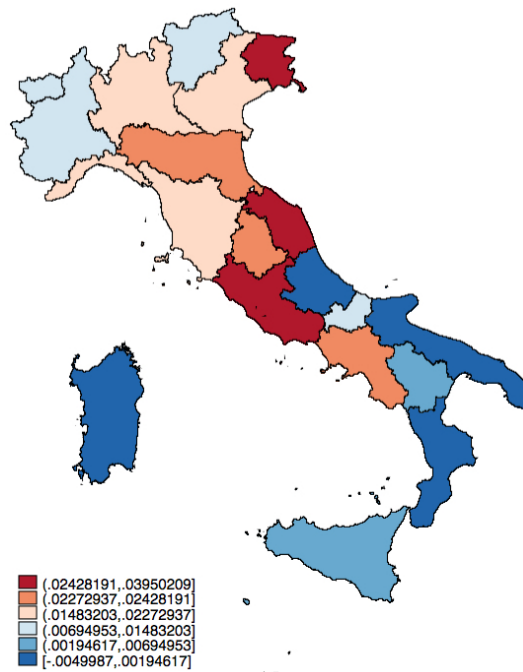
**Figure 6.**  
**Change in native employment - All workers.**  
**Administrative Regions, period 2011-2016.**



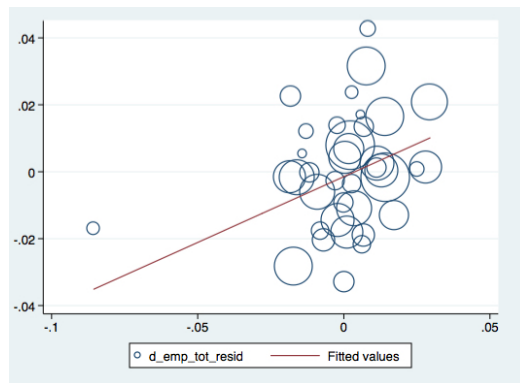
**Figure 7.**  
**Change in native employment - Low-Skilled.**  
**Administrative Regions, period 2011-2016.**



**Figure 8.**  
**Change in native employment- High-skilled.**  
**Administrative Regions, period 2011-2016.**

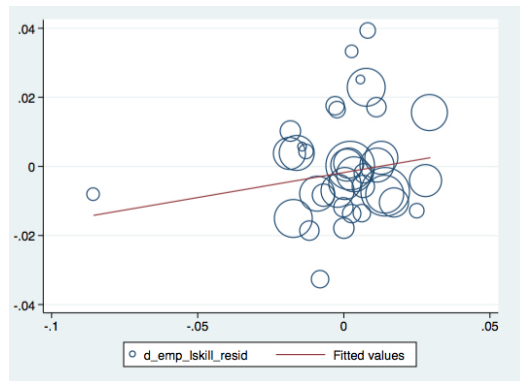


**Figure 9.**  
Change in immigrants and change in native employment – All workers.  
Administrative Regions, period 2006-2016.



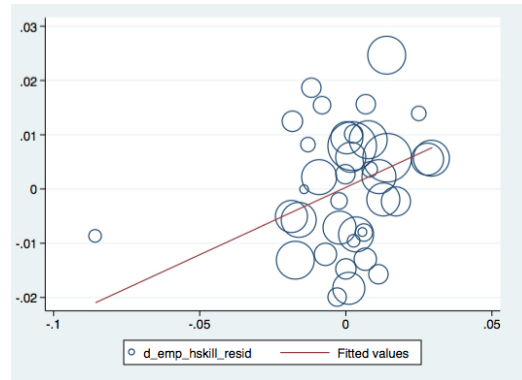
**Note:**  $\beta = 0.41$ ;  $s.e. = 0.138$

**Figure 10.**  
Change in immigrants and change in native employment - Low skilled workers.  
Administrative Regions, period 2006-2016.



**Note:**  $\beta = 0.15$ ;  $s.e. = 0.134$

**Figure 11.**  
**Change in immigrants and change in native employment - Low skilled workers.**  
**Administrative Regions, period 2006-2016.**



**Note:**  $\beta = 0.26$ ;  $s.e. = 0.094$

Appendix.

Figure 1.  
Change in immigrant population.  
Administrative Regions, period 2006-2016.

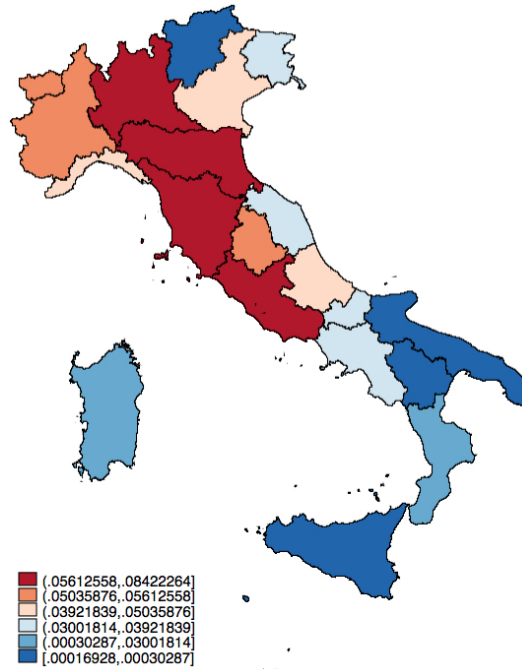
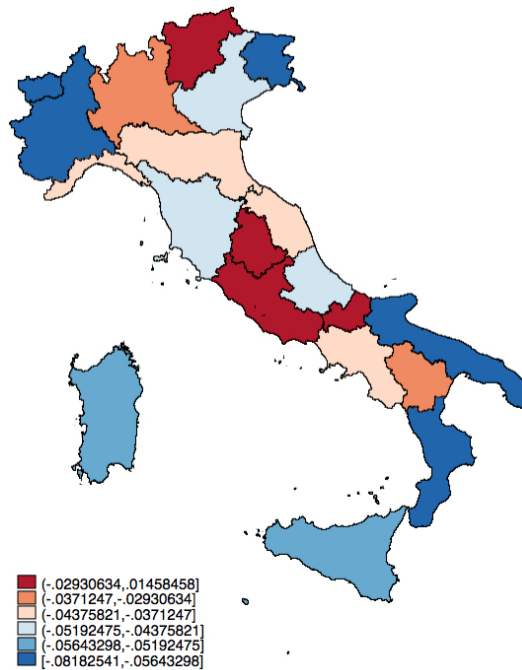
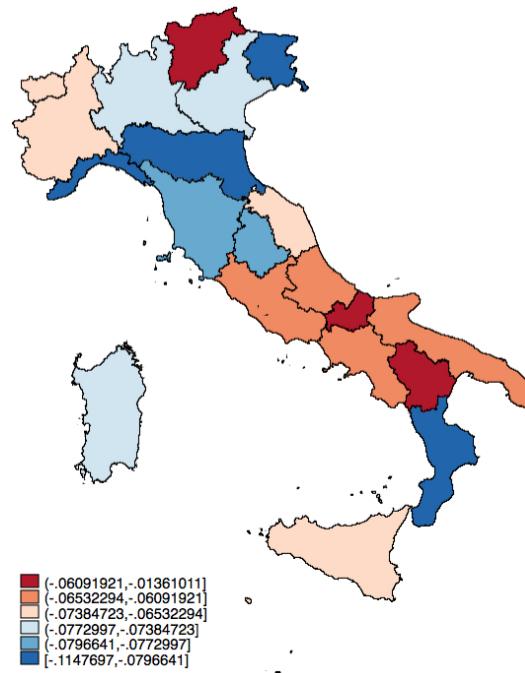


Figure 2.  
Change in native employment - All workers.  
Administrative Regions, period 2006-2016.



**Figure 3.**  
**Change in native employment - Low-Skilled.**  
**Administrative Regions, period 2006-2016.**



**Figure 4.**  
**Change in native employment - High-Skilled.**  
**Administrative Regions, period 2006-2016.**

