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"The Impact of Immigration on Native Employment: Evidence from Italy"

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Abstract

Whether host countries economically benefit or not from immigration is a longstanding debate. In this paper, by taking advantage of the consistent variation of foreign-born workers' settlements across local labor market, we investigate the impact of immigration on native employment in Italy over the period 2009-2017. Both the country and the time span considered represent an interesting novelty that adds a further piece of evidence to the existing literature. Despite the fact that immigration has recently become a major issue, the studies on the impact of immigration into Italy are indeed relatively scarce. In addition, the peculiar institutional framework of Italy, that plays a crucial role in the extent to which local labor markets are able to absorb immigration-induced supply shocks, makes this analysis particularly relevant. Likewise, the period analyzed is of extreme interest since it is characterized by the combination of the economic downturn and by an unprecedented increase of the migratory in inflows. Overall, the results contradict the belief that immigrants \take away jobs from natives" and present a scenario in which foreign-born workers have an average negligible impact on native employment opportunities. Consistently with the canonical model of immigration however, when distinguishing the native population by education levels, the results indicate a positive impact on high-educated natives and a strong negative one on low-educated. Nevertheless, after controlling for immigrants' "skill-downgrading" and for natives' over-education, the negative impact estimated for the latter experiences a consistent reduction.

JEL Classification: J15; J61; R23.

Keywords: Immigration; Employment; Local Labor Markets; Shift-Share; Bartik Instrument; Italian Provinces.

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1 Introduction

The last few decades have been characterized by an important increase of the international migration flows. Despite the fact that immigration from poor to developed countries is a long-standing phenomenon (see, to this purpose, Peri 2016), in the more recent years the previously smooth pattern has experienced a sharp rise, particularly in some EU countries.

The statistics on the international migration trends are somewhat indicative of this increasing pattern. According to the United Nations (2017), in less than twenty years the stock of international migrants has experienced a substantial rise: from 173 million individuals in 2000, to 258 million in 2017. It is interesting to notice that the growth rate of people residing in a country different from the one in which they were born is higher than the one of the world's population itself. Because of this reason, the share of foreign-born individuals over the total population increased from the 2.8% at the end of the XX century, to the 3.4% in 2017.

This unexpected and unprecedented rise has facilitated the entrance of foreign born workers in the host countries' labor forces. To this extent, immigrants have become a structural component of the productive sector of many developed economies. Because of these reasons, immigration has become central in both the academic and political debate. Overall, one important feature of immigration is that it has important policy implications. These give rise to different questions, that, in turn, are politically sensitive. In this context, in the past three decades, both economic theory and empirics have analyzed the economic impact of immigration, trying to emphasize its peculiar features. Many researchers and labor economists have attempted to disentangle the issue, focusing particularly on the extent to which immigration has a positive or negative effect on the labor market performances of natives. 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 native workers).

From the empirical point of view, the previous literature has focused its attention mainly on two aspects: the economic assimilation of immigrants (and their offspring) in host countries socio-economic context and their impact on native labor market performances (i.e. wages and employment opportunities). In the academic world, several studies have been carried out, mainly analyzing longstanding countries of immigration, the United States above all. The results obtained are somewhat contradictory (for an overview of the existing literature, see Longhi et al. 2010, Dustmann et al. 2016). Some researchers conclude in fact in favor of positive or null effects of immigration (see, for instance, Altonji & Card 1991, Butcher & Card 1991, Card 2001, 2005, 2009*b*, 2012, Peri & Sparber 2009, Ottaviano & Peri 2012, Card & Peri 2016, Clemens & Hunt 2017), while others present a scenario in which immigrants depress natives' labor market outcomes, at least in the short-run (e.g. Borjas 1994, Borjas et al. 1997, Borjas 2003, 2005, 2017, Borjas & Monras 2017, Monras 2015, Llull 2018*b*, Anastasopoulos et al. 2018).

In this context, the aim of this work is to shed new light over the economic impact of immigration into Italy. The Italian case is of particular interest for several reasons. First of all, in Italy the issue of immigration has assumed a central position in the political debate[1]. If in the past the Italian public opinion was split in two opposite factions: partisans and opponents (see, to this extent, Gavosto et al.

[1] In the last political elections, one of the parties that obtained more consensus was Salvini's Northern League, well-known for its anti-immigration rhetoric.

1999), more recently the latter have somewhat "taken over" the former. There is, to this extent, a somehow widely popular belief that immigration has only negative economic implications, because it reduces both wages and employment possibilities of natives.

Second, in the last decade Italy has experienced a severe economic downturn caused by the global financial crisis and the European sovereign debt crisis. According to OECD (2017) Italy has only in 2017 started to recovery from the long and deep recession that has characterized the last decade. The figures are quite shocking. 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 currently at the same level of 1997). In this scenario, one of the sectors more harshly affected was the labor market.

Alongside, the last decade was characterized by a significant increase of the migration inflows. 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 over the past two decades (both in absolute terms and as a share of the total population).

In this scenario, a portion of both of the political class and the public opinion, has blamed immigrants for the decline in the economic conditions of the country. Under these circumstances, it is at the same time interesting and policy relevant to carry-out an empirical exercise that allows to attest what is the actual impact of immigration into the Italian labor market.

The empirical analysis in the paper uses data for the Italian administrative provinces, over the period 2009-2017. In a first step, we apply what Dustmann et al. (2016) define as "Pure Spatial Approach", dividing the native population into six education-experience groups[2]. Then, we move to what we define as the "Aggregate Spatial Approach", alternatively considering the whole native population together or dividing it into different samples, based on educational attainments, occupation and gender.

Initially, we present a set of descriptive correlations, that however are fairly informative of the relationship between the variable involved. Then, in order to exploit the causal link that connects immigrants to native employment, we implement a two-stage procedure. Firstly, we control for the omission of potentially relevant variables by introducing in the baseline specification measures of internal migration (i.e. the net migration rate) and of labor demand shocks (i.e. the "Bartik" instrument). Subsequently, in order to control for the endogeneity caused by the non-random sorting of immigrants into local labor markets, we perform a 2SLS procedure using a "shift-share" instrument, which is standard practice in the existing literature.

Overall, in contrast with the negative vision of immigration, the analysis indicates that the impact that immigrants exert over natives' employment level in Italy could be negligible or even positive.

We believe that such analysis will contribute to the literature in different ways. First of all, we analyze a country (Italy) for which (i) immigration is a relatively recent phenomenon (see Del Boca & Venturini 2005), and (ii) the analyses on the labor market impact of immigration are limited[3] and consider a different time-

[2]Three education (i.e. high-school dropouts, high-school degree and university degree) by two experience levels (i.e. at most twenty years of experience and more than twenty years).

[3]The vast majority of published papers are relative to the U.S., U.K. or Germany (see Dustmann et al. 2016, Table 1 for an overview).

frame (e.g. Gavosto et al. 1999, Venturini & Villosio 2006). To this extent, the choice of the period under analysis also represents an interesting novelty because it is characterized by (i) the economic and financial crisis (followed by a period of deep recession), and (ii) the migration crisis and the inflows form Central and Eastern European countries (CEECs), since their access to the EU (see Hanson & McIntosh 2016, Labanca 2016).

In addition, Italy represents an interesting novelty also because of the peculiarities of its institutional framework. Specifically, 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 U.S. in which the wage bargaining is mostly de-centralized. In other words, wages are particularly insensitive to labor supply (or demand) shocks. This in turn means that the economy likely adjusts trough changes of the employment structure (Venturini & Villosio 2006). This characteristic clearly plays a crucial role in the extent to which local labor markets are able to absorb an immigration-induced supply shock.

The rest of the paper is structured as follows. Section 2 illustrates the background of the study. Specifically, we contextualize the main magnitudes of the Italian economy relative to the labor market trends and to the migratory inflows and we provide a brief overview of the theoretical argument on the labor market effects of immigration. In section 3 we present the empirical strategy followed and the variables involved. Section 4 s devoted to the description of the database used and to the presentation of some descriptive evidences. The main 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 identify the causal relationship between the variables involved. Results and some robustness checks are then presented in section 6, and we finally conclude the study in section 7.

2 Background of the Study

This section presents in detail the tendencies that have characterized the Italian economy in the period under analysis, both in terms of macroeconomic trends (sub-section 2.1) and of migratory inflows (sub-section 2.2). Afterwards, in subsection 2.3, we briefly review the contributions to of the economics of immigration that allow us to highlights the predictions on the economic impact of foreign-born workers on the native labor market performance.

2.1 The Recent Dynamics of Employment in Italy

The global financial crisis and the European sovereign debt crisis, have severely hit the Italian real economy. According to OECD (2017) Italy has only in 2017 started 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 10 percentage points. In this scenario, one of the sectors more harshly affected was the labor market. From a general comparison of performances of the Italian population before and after the crisis, it is easy to notice that many indicators have extremely worsened. According to the National Statistic Office (ISTAT), the unemployment rate indeed increased considerably, from the 8% level in 2004, to the 11.9% in

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 increased from 23.5% in 2004 to 40.3% in 2015. These negative trends have, in turn, increased the number discouraged workers. To this extent, the long-term unemployment rate boosted. After starting from 47.6 percentage points in 2004, it reached a level of 58.1% 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% points: from 11.8 in 2004, to 14% in 2015[4].

In the last few years however, 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 quarter. This small but important increase also favored the recovery of the labor market. According to the Labor Force Survey (LFS) conducted by the National Statistic Office, the trend in employment has reached the levels previous to the crisis in the Central and Norther 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 composed by young individuals with medium and high levels of education.

Overall in any case, the fourth quarter of 2016 was characterized by a rise in the employment rate, that reached 57.4%. 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% registered the third quarter of 2013 (**?**).

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 were 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. All these aspects have important implications within the context of the economic impact of immigrants in the Italian labor markets.

2.2 The Evolution of Immigration into Italy

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 1970s, almost 26 million Italians migrated abroad, half of them

[4]All the figures presented are drawn from the report "*Noi Italia - 100 statistics to understand the country we live in*", produced by ISTAT.

towards North and South America and the other half towards European countries (Del Boca & Venturini 2005).

However, mostly because of its position in the center of the Mediterranean Sea, since the end of the XX century, Italy has become one of the most active migrant-receiving countries. More precisely, the history of Italy as a country of immigration started in the 1970s and ever since then the migratory inflows have followed an increasing trend.

The more consistent inflows occurred in the 1990s, particularly in consequence of the Balkan war (Del Boca & Venturini 2005), and in the mid 2000s, by reason of the EU enlargement to Central and Eastern European countries. Specifically, in 2007 Bulgaria and Rumania joined the EU. Consequently, in particular due to the high incidence of people coming from these two countries, the number of "new EU" workers (i.e. those individuals that changed their status from non-EU to EU as consequence of the EU enlargement policy) increased from 56,254 units in 2006 to 440,604 in 2007 (INPS 2017).

More recently, according to OECD (2014) together with Spain, Italy is the European country with the highest increase of the foreign-born population since the beginning of the XXI century (both in absolute terms and as a share of the total population). The National Statistic Office indicates that, up to January 1^{st} 2018[5], the number of people with foreign citizenship residing in Italy was around 5.65 million individuals, which corresponds to the 8.4% of the total population (ISTAT 2018). In terms of non-EU citizens, up to January 1^{st} 2017, almost 3,7 million individuals legally reside in Italy. The more represented countries are Morocco (with 454,817 individuals), Albania (441,838), China (318,975), Ukraine (234,066) and the Philippines (162,469) (ISTAT 2017).

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. To this extent, according to the Ministry of the Interior between 2014 and 2015 the estimates indicate that around 325,000 irregular immigrants have arrived in the Italian soil. In 2016 the trend was confirmed, with about 181,000 people entering Italy, while in 2017 it was somehow reduced, with around 119,000 new arrivals.

2.3 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, 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 view. In the next paragraphs, we summarize the ones most relevant for the analysis conducted in this study.

From a theoretical point of view, the economic impact of immigration can be described within a labor supply and demand framework. Assuming for simplicity that the labor supply is perfectly inelastic, the main effect of immigration is to increase the labor supply itself.

[5]These are the estimates for the year 2017.

Initially, let's consider immigrants and natives as homogeneous workers in terms of skills and education. In the short-run, an immigration-induced labor supply shock causes a rightward movement of the labor supply curve. Since the capital stock is fixed (Borjas 2014), firms are not able to adjust their capital-labor ratios. This increase in the labor force makes labor cheaper. Therefore, the economy adjusts and reaches a new equilibrium which is characterized by overall higher employment levels, but, at the same time, by lower wage rates.

However, if we relax the assumption of an inelastic labor supply, immigration is likely to cause a decrease of both native wages and employment. In addition, it is important to underline that in reality, because of the presence of labor market institutions (unions above all), firms are not allowed to freely downward adjust the wages they offer. This might have a detrimental impact on native employment levels[6]. This is what is defined as *competition effect* from immigrants (Gavosto et al. 1999).

In the long run, instead, assuming that the supply of capital is perfectly elastic, firms adjust their capital-labor ratios and, therefore, wages and employment levels are assumed 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.

However, to consider immigrants and native homogeneous workers is a strong assumption, often not realistic. In order to address the issue of whether immigrants and natives are complementary or substitutes, the literature has implemented the so called 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 different studies, but, overall, key elements are educational levels (Altonji & Card 1991), type of occupation (Card 2001) or a combination between education and experience (Borjas 2003, Ottaviano & Peri 2012, Llull 2018*b*). 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 within the same skill-cells[7]. 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. 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[8]. 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 (Dustmann et al. 2005). 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[9].

[6]This is particularly valid in the case of the Italian economy, which is characterized by the strong presence of unions.

[7]This implies that foreign-born workers can take-over natives' jobs, within the same skill groups.

[8]Without loss of generality, equilibrium wages are allowed to differ across groups.

[9]However, Dustmann et al. (2008) show that, in the case of the U.K., the surplus that high-skilled workers receive is higher than the welfare loss faced by the low-skilled ones. This means

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 would be smaller than in the case of a perfectly inelastic labor supply.

Of course, the economy can also adjust through different mechanisms, like changes in the output mix, technological changes, increase of productivity or differences in international trade volumes (Dustmann et al. 2005, 2008, Basso & Peri 2015). However, even in these cases, the effects of immigration are similar to the ones already described.

This theoretical framework implies different conclusions. First, as already indicated, immigration can alter the original equilibrium only if the skill composition of the newly arrived workers (i.e. immigrants) 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 the native labor market performances (Dustmann et al. 2008).

Second, in this simple framework it is 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 that immigrant exert on the host countries' labor market can change, in the case in which this assumption is relaxed.

This study however analyzes a peculiar country (Italy), in terms of the characteristics of its labor market. In particular, the Italian labor market can be defined as a "dual" one. In practical terms, this implies that it is possible to distinguish among two type of workers:

i People with permanent contracts and high levels of both job protection and unemployment benefits.

ii People with temporary contracts, characterized by low levels (if any) of both job protection and employment benefits.

In this context, immigrants, due to the fact that they experience what is defined as a "skill-downgrading" once entering the host country's labor market (Fullin & Reyneri 2011, Dustmann et al. 2016), tend to compete with the latter, while the former are not directly affected.

Assuming now that there is a demand of low-skilled workers (as can typically be the case in some sectors like construction or agriculture that are particularly important in the Italian economy), then firms can hire the low-skilled immigrants workers and therefore increase their productivity. This, in turn, might drive to a further upward shift in the labor demand that can be beneficial also for native workers[10]. This is what is typically defined as *complementarity effect* between immigrants and natives.

All in all, however, the extent to which an economy can react to an immigration-induced labor supply shock is an empirical issue, that we will try to address in the next sections.

that, at the aggregate level, the economy will benefit from immigration.

[10]Because it can cause an increase of both wages and employment levels.

3 Empirical Model

As indicated by Dustmann et al. (2016), the literature on the economic impact of immigration on the natives labor market outcomes can be divided in three categories: (i) the "National Skill-Cell Approach", pioneered by Borjas (2003) and then used by Aydemir & Borjas (2007), Borjas (2014), Card & Peri (2016), Llull (2018*b*), (ii) the "Pure Spatial Approach", as in Card (1990), Altonji & Card (1991), Dustmann et al. (2005, 2013), Card (2009*a*), Basso & Peri (2015), Foged & Peri (2016), Borjas (2017), Peri & Yasenov (2018), and (iii) the "Mixture Approach" implemented, for instance, by Card (2001), Borjas (2006), Card (2009*b*), Glitz (2012), Basso & Peri (2015), Dustmann & Glitz (2015).

Dustmann et al. (2016) claim that the first and the third approaches present some important drawbacks. More precisely, in the case of the national skill-cell approach the parameter estimated is difficult to interpret, while in the pure spatial approach this problem is not present. To this extent, both the national skill-cell and the mixture approaches identify the "relative" effect of immigration, that is the effect that immigrants exert on most similar natives (i.e. belonging to the same education-experience group). The pure spatial approach instead identifies the "overall" effect, which indicates the impact of immigration on the economy as a whole. The parameter estimated in this approach is the most easily interpretable and the most policy relevant one.

In addition, the national skill-cell and the mixture approaches are based on the assumption that immigrants and natives are homogeneous in terms of their observable education and experience levels. Nevertheless, there are empirical evidences indicating that immigrants experienced what is called skill-downgrading (see Dustmann et al. 2016, Fullin & Reyneri 2011). This phenomenon plays a crucial role when estimating the impact of immigration within the national skill-cell or the mixture frameworks, since in both immigrants (and natives) are assigned to some particular skill groups based on their measured education and experience. To this extent, the presence of skill-downgrading might cause an incorrect classification of immigrants into education-experience groups that, in turn, lead to a bias in the estimated impact.

As indicated by Dustmann et al. (2016) however, the pure spatial approach is "robust to downgrading as [it] does not require the allocation of immigrants into skill groups".

3.1 Pure Spatial Approach

Because of these reasons and given that the interest of the paper is in the absolute effect of immigration on the native employment, we initially implement what Dustmann et al. (2016) define as the pure spatial approach. According to Borjas (2014)[11], this procedure identifies a coefficient that can be interpreted as a "spatial correlation" between immigrants and the employment structure of the native population.

This approach, pioneered by Grossman (1982) and King et al. (1986), exploits the fact that different locations (that are assumed to overlap local labor markets) generally experience non-homogeneous immigrants' inflows (in terms of their magnitude, that is in terms of the number of people entering each particular labor market). Immigrants indeed tend to cluster in some specific areas that are characterized (i) by good economic condition (i.e. higher wages and better employment possibilities), and (ii) by the presence of familiar or personal networks (i.e. by

[11] Chapter 4, page 80.

the presence of a consistent number of people coming from the same country of origin).

This uneven spatial distribution of foreign-born individuals represents an interesting source of variation that can be exploited in the extent of empirically estimating the impact of immigration on native employment.

In this framework, the correlation between the inflow of the total amount of immigrants in the area and the change in employment of natives of a given skill-cell is estimated. In the case of this study, are defined as the combination of three education (i.e. high school dropouts, high-school degree and university degree) by two experience levels (i.e. at most twenty years of experience and more than twenty years). Following Borjas (2003), we define experience as the difference between age and the age at which each individual is assumed to have entered the labor market, given his/her level of education[12].

As for the spatial units in which the two magnitudes of interest are measured, we use the set of Italian provinces, as they are the administrative units (for which the required data are available) that are closer to the concept of local labor markets.

To this extent, our baseline specification takes the following form:

$$\Delta(y_{a,k,t}) = (\phi_k \times \psi_t) + \beta\Delta(m_{a,t}) + \nu_{at} \tag{1}$$

where $\Delta(y_{a,k,t})$ indicates the change in native employment occurred in province a at time t, for group k. More precisely, the variable is defined as:

$$\Delta(y_{a,k,t}) = \frac{(L^{Itb}_{a,k,t+2} - L^{Itb}_{a,k,t})}{pop_{a,k,t}} \tag{2}$$

where $L^{Itb}_{a,k,t}$ indicates the number of Italian-born workers in area a, in education-experience group k, at time t. Finally, $pop_{a,k,t}$ indicates the working age population of area a at time t belonging to each education-experience group k. Consequently, $\Delta(y_{a,k,t})$ captures the growth rate of the native employment between t and $t+2$. In the analysis, we have considered t=2009, 2011, 2013, 2015 and 2017.

The main independent variable is $\Delta(m_{a,t})$ and is constructed as to capture the growth rate of the total immigrant population of every Italian local labor market. This variable is defined as:

$$\Delta(m_{a,t}) = \frac{(m_{a,t+2} - m_{a,t})}{pop_{a,t}} \tag{3}$$

where $m_{a,t+2}$ and $m_{a,t}$ indicate the number of working age foreign-born individuals in area a at time $t+2$ and t, respectively. As before, $pop_{a,t}$ indicates the working age population of province a at time t.

The specification also includes the interaction between the group (education-experience) and time fixed effects ($\phi_k \times \psi_t$). As indicated by Dustmann et al. (2016) they control for "nation-wide education-experience specific time trends" in labor demand[13]. Finally ν_{at} is a random term *i.i.d.* distributed with zero mean

[12] In particular, we assume that the age of entry into the labor market is 14 for high-school dropouts, 19 for people with a high-school diploma, and 24 for people with a university degree.

[13] Following Card & Peri (2016) and Dustmann et al. (2016), we only include a set of fixed-effects that capture the interaction between skill-groups and time trends. The reason behind this choice is that the area-specific time-invariant unobserved heterogeneity vanishes when computing the variables as first-differences. Indeed, to control for area fixed-effects in a first-differences specification is equivalent to impose a linear trend by area that could cause misspecification.

and variance σ^2_ν.

The coefficient of interest is β that indicates the increase, expressed in percentage points, in the (change of the) native employment, associated to a unitary percent increase in the immigrant population.

Some studies (Card 1990, Hunt 1992, Gavosto et al. 1999, Venturini & Villosio 2006, Barone & Mocetti 2011, Basso & Peri 2015, Foged & Peri 2016, Borjas 2017), have estimated an "aggregate" version of equation 1, where the change in *total* employment in the area is used as the dependent variable. This internalizes cross-groups effects and can provide more precise estimates when the number of observations used to compute the change in employment for each group is low and/or the sample does not represent the entire population of each group (as might be the case of the data from the Italian LFS).

Because of these reasons, we implement a particular case of the pure spatial approach that we define as "Aggregate Spatial Approach". More precisely, in this framework equation 1 is modified as follows:

$$\Delta(y_{a,t}) = \psi_t + \beta\Delta(m_{a,t}) + \nu_{at} \tag{4}$$

where $\Delta(y_{a,t})$ indicates the change in native employment and is defined as:

$$\Delta(y_{a,t}) = \frac{(L^{Itb}_{a,t+2} - L^{Itb}_{a,t})}{pop_{a,t}} \tag{5}$$

where $L^{Itb}_{a,t+2}$ and $L^{Itb}_{a,t}$ indicate the number of Italian-born workers in area a at time $t+2$ and t, respectively. Consequently, $\Delta(y_{a,t})$ indicates the growth rate of the native employment between the two time periods. Finally, ψ_t denotes time fixed-effects.

A substantial limitation that characterize the spatial correlation approach (see, to this purpose, Borjas 2003, 2006, Dustmann et al. 2005, Monras et al. 2018) is that local labor markets are not *closed economies*. This implies that people can react to immigrants' inflows by "voting with their feet" and move towards other locations. As a result, an analysis conducted at the local level can indicate a weak (or even absent) correlation between immigrants and native labor market outcomes, not because foreign-born individuals are not actually harmful for their native counterparts, but because the internal migration produces an adjustment mechanism that brings the labor markets back to their initial equilibria.

Although internal mobility in Italy is relatively limited (Venturini & Villosio 2006), in order to still address this issue, we introduce in our baseline specification a measure of internal migration, namely the *net migration rate*.

Therefore, equations 1 is modified as follows:

$$\Delta(y_{a,t}) = \psi_t + \beta_1\Delta(m_{a,t}) + \beta_2 N_{a,t} + \nu_{at} \tag{6}$$

where $N_{a,t}$ indicates the net migration rate that, similarly to Mocetti & Porello (2010), is defined as follows:

$$N_{a,t} = \left[\frac{(I_{a,t} - O_{a,t})}{pop_{a,t}}\right] \cdot 1000 \tag{7}$$

where $I_{a,t}$ indicates the number of people immigrating into area a at time t and $O_{a,t}$ the number of people emigrating out of the same area in the same time period.

Again, $pop_{a,t}$ indicates the working age population of area a at time t. In the empirical specifications, the variable is introduced as the average net migration rate of the two years previous to each observation. In other words:

$$N_{a,t} = \frac{(N_{a,t-2} + N_{a,t-1})}{2} \tag{8}$$

As before, the coefficient of interest is β_1 which indicates the impact of immigration on native employment, "cleaned" from internal migration.

Equation 4 is modified similarly to account for internal migration in the aggregate spatial approach.

3.2 Identification of the Effect of Immigration

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 (see, to this purpose, Acemoglu & Autor 2011, Autor & Dorn 2013, Basso & Peri 2015). As we have already indicated, the last decade was characterized initially by the global financial crisis, and, later on, by the European sovereign debt crisis. Italian real economy was strongly affected by both shocks, and, consequently, its local labor markets experienced some turbulences. To this extent, 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 are characterized by higher wages, employment rates and productivity and by more technology-intensive industries. In contrast, the Italian "mezzogiorno" is 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 different ways and this could confound the estimation of the effect of immigration. Therefore, in order to identify the specific impact induced by immigration flows on the change of native employment, it is important to control for those productivity changes that different industries can have experienced in the period of time considered (as indicated by Basso & Peri 2015). In the literature, one of the most widely used methods to capture these changes in labor demand is by controlling for the so-called "Bartik" instrument (Bartik 1991).

To this extent, equation 6 is modified as follows:

$$\Delta(y_{a,t}) = \psi_t + \beta_1 \Delta(m_{a,t}) + \beta_2 N_{a,t} + \beta_3 \Delta(B_{a,t}) + \nu_{at} \tag{9}$$

where $\Delta(B_{a,t})$ indicates the change in the "quantity version" of the Bartik instrument (see, to this purpose, Baum-Snow & Ferreira 2015) defined as:

$$\Delta(B_{a,t}) = \sum_j \left(\frac{L_{a,j,t_o}}{L_{j,t_o}} \cdot \Delta \ln L_{j,t} \right) \tag{10}$$

where $\frac{L_{a,j,t_o}}{L_{j,t_o}}$ indicates the employment share of each industry[14] j, in province a in the initial year t_0. $\Delta \ln L_{j,t}$ indicates instead the change of the (logarithm of) employment, occurred in each industry j at time t, in Italy as a whole. Therefore, the Bartik instrument captures the effect of changes in labor demand that are not province-driven.

[14] More details on the industries classification are given in the Appendix.

Again, the coefficient of interest is β_1, which indicates the percentage increase in the native employment, in response to a unitary percent increase in the immigrant population, after controlling for both internal migration and shifts in the local labor demand that are caused by shocks occurred at the national level.

The inclusion of the Bartik control allows us to make progress towards the identification of a causal relation between immigrants inflows and changes in native employment. This variable is indeed assumed to control for the relationship that occurs between local employment and local labor demand changes[15]. Its inclusion, together with the measure of internal migration, can presumably capture all the determinants of the dynamics of the native employment, different from the inflow of foreign-born workers into the local labor market. Then, it is expected that β_1 captures the variation in native employment exclusively attributable to changes in the presence of immigrants in the labor market.

However, immigrants' location decisions are most likely not randomly taken, but they are connected with the labor market outcomes of the destination economies. In other words, as previously indicated, immigrants tend to settle in areas characterized by better economic conditions and by the presence of other individuals coming from the same country of origin. This can create a bias in the estimated coefficients of the regressions. A common way to solve this problem is by using an instrumental variable approach. This, in addition, can be a helpful method in the extent of identifying the causal effect of immigrants' inflows on native employment. Following the path set by Altonji & Card (1991)[16], a commonly used approach is to build a variable that proxies the labor supply-driven shocks of the immigrants' inflow. The main rationale behind this instrument is that immigrants tend to settle in locations characterized by the presence of other individuals coming from the same country of origin (see Bartel 1989, Hanson & McIntosh 2016). In other words, there is some sort of serial correlation, in the sense that the number of foreigners from a country in province a at time t is somewhat connected with the past number of immigrant from this country. The figure so constructed is assumed to be a reasonably exogenous and robust predictor of the growth of immigrants' inflows. To this extent, this shift-share type of instrument has been extensively used in the existing literature (see, for instance, Card 2001, Barone & Mocetti 2011, Basso & Peri 2015).

Therefore, we perform an IV/2SLS approach, using as instrument the so-called "shift-share" variable that is defined as follows:

$$\Delta(\widehat{m_{a,t}}) = \frac{\widehat{m_{a,t}} - \widehat{m_{a,t-2}}}{\widehat{m_{a,t-2}} + Itb_{a,t-2}} \tag{11}$$

where

$$\widehat{m_{a,t}} = \sum_o m_{a,o,t_0} \cdot \frac{m_{o,t}}{m_{o,t_0}} \tag{12}$$

[15] 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.

[16] To be precise, Altonji & Card (1991) first control for the fact that immigrants' location decisions are not randomly taken. However, they did not propose an "actual" IV approach. They instead suggested to use a measure of past immigrant settlement, which, they argued, was presumably endogenous with respect to the actual conditions of the local labor markets. This approach was then refined by Card (2001), who for the first time introduced the shift-share instrument that has been widely used since then.

The subscript o indicates immigrants' countries of origin and t_0 the baseline year that is supposed to be consistently distant from the year(s) in which the native employment is measured (in our case $t_0 = 2003$). Finally, in equation 11 $Itb_{a,t-2}$ indicates Italian-born people in year $t-2$.

4 Data and Descriptive Analysis

In this section, we provide information on the data sources used to construct the final dataset and 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 local labor markets.

4.1 Data Source

The most common data source used in the existing literature on the economics of immigration are the population censuses. However, such information is not available for Italy. Therefore, in the current analysis, two main data sources have been used. Information about the Italian population, for both natives and foreign-born individuals, are taken from the Italian Statistic Office (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 province.

In addition, as done by Dustmann et al. (2005, 2013), Barone & Mocetti (2011), D'Amuri & Peri (2014), Labanca (2016), we draw the information on native employment from the microdata files of the Italian Labor Force Survey (LFS), carried out by the Italian Statistic Office on a quarterly basis. More precisely, we have used the cross sectional quarterly data that are available starting from the first quarter of 2009. The LFS is representative of the main magnitudes of the aggregate Italian labor market (e.g. employment status, type of job, job search, wages, etc.), disaggregated by gender, age, citizenship and geographical scope (up to the provincial level). In particular, we have used the LFS files for the period 2009 to 2017. They have allowed us to compute the changes in native employment over two-years periods. This was preferred over the yearly changes to minimize somehow the very short-term fluctuations. Changes over longer time periods were discarded in order to have enough observation in the temporal dimension. 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 for the years under analysis.

Since the objective of the paper is to assess the effect of immigration on natives' employment, we have only considered, for both Italians and foreign-born individuals, the working age population[17].

The main results in the paper are obtained for the Italian provinces (102)[18] that are close to the concept of local labor market. In a robustness check's results are also obtained for the 20 Italian regions.

4.2 Descriptive Analysis

Before presenting the results of the empirical model previously introduced, in this section we provide some descriptive evidences of the relationships between the main variables under analysis.

[17] 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.

[18] An overview on the provinces considered is given in the Appendix.

Figure 1 shows the variation of the change in immigrant population across the Italian provinces relative to the same period of time. Not surprisingly, the spatial distribution is somewhat similar to the one presented for the change in native employment. This implies that a higher presence of immigrants is registered in those provinces offering better socio-economic conditions[19].Indeed, observing more carefully the map, one can notice that higher values of the variable are especially found in some north- and central-western provinces, and in few southern ones[20].

Figure 2 presents instead the spatial distribution of the change in native employment (for all workers) across the Italian provinces relative to the period 2009-2017. There are some interesting aspects to highlight. First, the map does not present a clear spatial pattern, although it seems that higher values are concentrated in the center-western and north eastern provinces. Second and most important, not surprisingly given the economic downturn in the period under analysis the vast majority of Italian provinces have experienced a decrease in the native employment (with only few exceptions).

Although they allow a geographical visualization of the phenomenon analyzed, the maps fail to provide more clear-cut evidences on the correlation between immigration and native employment. To address the issue, figure 3 presents the association between the change in the immigrant population and the change in native employment, relative to all workers (i.e. without distinguishing by level of education or task performed). Following Basso & Peri (2015), we have subtracted from each variable the time averages. This allows us to obtain a "cleaner" visualization of the phenomenon. The graph clearly shows a positive correlation between the two variables. The coefficient of the simple regression is statistically significant at 10% level and is quite large in magnitude (0.429). However, the correlation should not be interpreted as evidence of a causal effect. The next section moves into this dissection.

5 Results

In this section we present the results relative to the empirical framework sketched in section 3. Table 1 reports the ones of the pure spatial approach in equation 1. As previously indicated, this procedure identifies the total effect of immigration on native employment (Dustmann et al. 2016). The different columns present results relative to different specifications. Column (1) shows the baseline regression, without the inclusion of any control variables. The estimated coefficient is positive and significant (at 5%), with a relatively high magnitude (around 0.9). When controlling for demand shocks through the Bartik instrument and internal migration in column (2), the magnitude of the coefficient is even higher (around 1.1), indicating a strong positive correlation between immigrants and native employment. Once controlling for endogeneity using the IV estimator, the coefficient is still positive and relatively high (around 0.7), but it is not anymore precisely estimated (column (3)). However, it is important to underline the fact that the small sample size used to construct the figures of native employment by groups, can cause a problem of measurement error that, in turn, may have induced an upward bias in the estimated coefficients. Therefore, this implies that the results

[19]This, on the other hand, brings out the presence of a reverse causality bias that we address performing an IV approach.

[20]It is important to stress that southern provinces are not particularly characterized by good economic conditions. However, the main reason behind the high presence of immigrants in some of them is due to the fact that they are dominated by the presence of manual-intensive industries, in which immigrants are employed.

of table 1 should be taken with caution.

In order to obtain more solid results, we move into what we previously defined as the aggregate spatial approach in equation 9. To this extent, table 2 summarizes the results of the estimation of the regression between the change in immigrant population and the change in native employment, relative to all workers (i.e. without distinguishing by education levels or task performed). Both in the case of the baseline specification and when including the control variables, the OLS estimates indicates the presence of a positive and statistically significant correlation between immigrants and native employment with an estimated coefficient that varies between 0.43 to 0.46. Once controlling for endogeneity, however, this positive relationship vanishes, indicating somehow the presence of an upward bias due to the non-random sorting of immigrants across locations. More precisely, the IV/2SLS estimates of the coefficient become negative, although its magnitude is fairly small (-0.07) and is not precisely estimated. All in all, in line with the finding of Basso & Peri (2015), table 2 shows an overall negligible impact of immigrants on native employment.

As already indicated, in table 2 we have considered all native-born workers together. However, while somewhat informative because it estimates the overall effect of immigration on native employment, this approach is based on the assumption that immigrants and natives are homogeneous workers. Nevertheless, both theoretical and empirical evidences seem to contradict this hypothesis (see, to this purpose, Kerr & Kerr 2011, Borjas 2014). In other words, immigrants may act as complementary for a part of the native population, namely the highly educated one (like found by Chassamboulli & Palivos 2013, Dustmann et al. 2017) and as substitute for natives with low levels of education (as indicated by Altonji & Card 1991, Dustmann et al. 2017). Therefore, in order to asses the impact of immigration on most similar natives, we divide the latter into two sub-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). We then consider again the correlation between these two categories of workers and the change in immigrant population. The results are summarized in table 3.

Our preferred specification (i.e the specification with all the controls estimated by 2SLS in column (3)) reveals the presence of a strong positive impact on high-educated natives, with a coefficient of around 0.9 and a strong negative impact on low-educated ones, with a coefficient with similar magnitude (again around 0.9, in absolute terms), but opposite sign.

Overall, these findings are consistent with the canonical theoretical model of immigration according to which, in the short-run, immigrants are expected to lower the employment of natives for whom they are closer substitutes (i.e. low-educated) and to increase the employment of complementary workers (i.e. high-educated) (see Kerr & Kerr 2011).

It is important to notice, however, that the native population often suffer a phenomenon of "over-education" (see Matano & Naticchioni 2017). In other words, native people are sometimes employed in occupations that require less years of schooling than the ones actually held. Alongside, the existing literature indicates that immigrants often experience a similar problem that is defined as "skill-downgrading" (Dustmann et al. 2013). This implies that they tend to be employed in occupations for which they are over-educated (see Fullin & Reyneri 2011, Dustmann et al. 2016). To this extent, the results on the impact of immigration on high- versus low-educated natives can be upward biased (i.e. the magnitude of the impact could exceed the "actual" effect that immigrants exert on high- and

low-educated natives). To address the issue, we therefore propose an alternative classification of the native population, based on the type of task performed. In particular, we divide the native population in three categories, namely white collars, skilled manual workers and blue collars.

The results for these groups are presented in table 4. The complementarity/substitutability effects identified in table 3 in the case of education groups are still present although somewhat reduced. The 2SLS procedure points out three important elements: (i) there is a moderate detrimental effect on blue collar workers, with an estimated coefficient of -0.46, (ii) there is a moderate positive impact on white collars, with a coefficient of 0.27 (although not statistically significant), and (iii) there is a negligible impact on skilled manual workers, with a coefficient relatively low in magnitude (-0.01) and not statistically significant.

In addition, the existing literature has also found that the impact that immigrants exert when entering the host countries' labor market might affect in a different way males and females (see, for instance, Barone & Mocetti 2011, Farré et al. 2011, Forlani et al. 2015). Because of this reason, we distinguish the native population by gender. As before, we initially consider all males and all females together, irrespective on their level of education. Then, we divide them in different sub-samples, based on their educational attainments. Table 5 summarizes the results relative to the impact of immigration, when distinguishing by gender. According to the 2SLS approach, there is a small positive effect for females and negative for males but not significant in both cases. This is consistent with the results for whole population presented in table 2.

In a further step, in table 6, we consider only the female native workers, but distinguishing by their level of education. Consistently with Barone & Mocetti (2011) that find that the high presence of immigrants providing household services is associated with an increase of the hours worked by the high-skilled native females, the positive impact obtained in the previous table seems to be particularly triggered by high-educated females. Finally, table 7 summarizes the results relative only to the native male population. As found in table 4 for the whole population, the table indicates a strong positive impact on high-educated males and a strong negative low-educated ones. These results are somehow in line with the findings of Llull (2018*a*) for the US. Specifically, he analyzes the effect of immigration on native wages and finds that "less educated, younger, and male individuals are more affected than highly educated, older, and female".

6 Additional Results

In this section, we first present the results of some robustness checks. First, considering the "Multiple Instrumentation Procedure" suggested by Jaeger et al. (2018) to control for the potential endogeneity of the shift-share instrument (sub-section 6.1). Second, comparing the results when using regions instead of provinces as unit of analysis (sub-section 6.2).

6.1 Multiple Instrumentation Procedure

Recently, Jaeger et al. (2018) pinpointed that the local labor market adjustments to an immigration-induced supply shock are not immediate, but require some time. This "slow" response can cause the violation of the exclusion restriction assumption of the instrumental variable approach. In turn, this implies that the shift-share instrument is not completely exogenous. To address the issue they

suggest a "multiple instrumentation" methodology that consists in the introduction of an instrument for the current immigrant settlement and one for its lag (that is assumed to capture the past immigrant inflows). We apply this approach in this sub-section as a sort of robustness check.

Results are presented in table 8. Analogously to what is reported in table 1 and 2, results appear to be robust to the inclusion of the lag. In particular, in the case of the pure spatial approach (panel A of the table), our preferred specification (2SLS) indicates a positive coefficient with almost the same magnitude as the one presented in table 1 (both are around 0.6), although not precisely estimated. Similarly, in the case of the aggregate spatial approach (panel B), the 2SLS estimation presents a small negative but imprecisely estimated coefficient, very similar in magnitude to the one of table 2 (-0.067 against -0.07). All in all, these results indicate an overall negligible impact of immigration on the native employment.

At this purpose, however, it is important to notice that to be efficient, this procedure requires consistent variation in immigrants' countries of origin composition. This however is not necessarily the case for the Italian context, especially in a short time frame as the one considered in this analysis (i.e. 2009-2017). In addition, it is important to underline that Jaeger et al. (2018) consider the U.S. economy, that is characterized by a longstanding tradition of immigration. Therefore, as indicated by Peri (2016), the share of foreign-born individuals over the total population followed an increasing but smooth pattern over time. This implies that the local labor markets adjustments caused by these persistent immigration-induced supply shocks are not immediate. This, in turn, means that the shift-share instrument, which is based on past immigrants' settlements, might not be completely exogenous with respect to the conditions of the local labor markets.

In Italy, however, the situation is fairly different. Indeed, as indicated by Del Boca & Venturini (2005), Italy has only recently changed its role form immigrant-sending to immigrant-receiving country. In addition, in the period under analysis the "Arab Spring" (see Hanson & McIntosh 2016, Labanca 2016) and, more recently, the Libyan civil war, caused a sudden resurgence of the migratory flows towards Italy. This implies that it is likely that the adjustment mechanism did not operate yet and therefore the exogeneity of the shift-share instrument might not be violated.

6.2 Regional Level Analysis

As a sort of robustness exercise that allows us to strengthen the results presented in section 5, we estimate the empirical models previously introduced by increasing the geographical scope to the regional level. This allows us to control for commuting that would not be captured by the net migration rate.

2SLS Estimates are presented in tables 9 and 10. More precisely, in table 9 we consider the whole native population. The first column is relative to the pure spatial approach, as presented in equation 1. In this case, the estimated coefficient is positive and statistically significant, with fairly high magnitude. Columns (2) to (7) show instead the results of the aggregate spatial approach and the differences between columns are given by the samples considered (as indicated at the top of each column). Overall, the coefficients estimated indicate the presence of a positive or negligible impact of immigration on the native employment.

In table 10 instead we distinguish by gender and, within genders, by education levels. In the case of women, the impact that immigrants exert on the native employment is positive (in the case of high-educated individuals) or negligible (in the other cases. For men instead, the table indicates a strong positive impact on high-

educated individuals and a strong negative on low-educated ones that, however, they balance each other out in a resulting negligible overall impact (consistently with the province level analysis).

Overall, the results of the regional-level analysis are consistent with those drawn for provinces.

7 Conclusions

The last decade in Italy has been characterized by two important facts. First of all, the economic downturn caused by the global financial crisis and by the European sovereign debt crisis has produced an unprecedented deterioration of the labor market performance. At the same time, Italy has changed its role from immigrant-sending to immigrant receiving-country. The political turmoil that have characterized Southern and Eastern borders of the Mediterranean See in the last few years, have 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, mainly focused on countries with a longstanding tradition of immigration (e.g. US, UK or Germany), 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.

This work contributes to the literature in different ways. First, we shed new lights on the employment effects of immigration in a period in which the anti-immigration sentiment has reached unprecedented levels. To this extent, as already pointed out by Gavosto et al. (1999) "as in many other countries, in Italy the issue of immigration is highly sensitive and politically charged". However, if in the past the public opinion was split in two opposite factions: partisan and opponents (Gavosto et al. 1999), more recently the latter have somewhat "take-over" the former[21].

Second, we analyze a country (i) for which the studies on the labor market impact of immigration are relatively limited, and (ii) that is characterized by a peculiar institutional framework that plays a crucial role in the extent to which local labor markets are able to absorb supply shocks.

These aspects make this analysis particularly interesting as it is relative to a very sensitive topic nowadays. In addition, this study has also interesting policy implications. In fact, according to the National Statistic Office of Italy (ISTAT), the average age of the Italian population is constantly increasing and, simultaneously, the natural population change is negative. In other words, the native population is declining over time. To this extent, the degree of resilience of the Italian social security system is doomed to fail in a near future. However, if immigrants do not exert a negative impact on native workers and on the productive system (as it seems to be the case), their integration into the Italian economy

[21] To this extent, the Deputy Prime Minister and Minister of the Interior of Italy is Matteo Salvini, who is also Federal Secretary of the Northern League, a political party well-known for its anti-immigrant rhetoric.

could represent a valid solution to this problem.

Overall, the evidence of this paper indicates a positive or null impact of immigration on native employment in Italy. A negative impact is found for low educated Italian born. However, when dividing the native population into different groups based on the occupation, this negative impact experiences a consistent reduction. Specifically, blue-collar workers result negatively affected by the presence of immigrants, although the coefficient estimated is considerably lower with respect to the one estimated for the impact on low-educated natives.

In addition, results on gender indicate that the overall impact is negligible. Specifically, high-educated females seem benefit from the presence of immigrants, while low-educated ones are not affected. For men the distinction is instead sharper. More precisely, if high-educated individuals favor from immigration, low-educated ones conversely suffer a strong form of competition.

Nevertheless, we are in favor of affirming that in general terms immigrants do not seem to displace native workers. This conclusion, is also in accordance 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 & 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[22] (Peri & 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 individuals. 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.

[22]Especially because of a better knowledge of the language.

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Figure 1: Change in immigrant population.
Administrative provinces, pooled 2009-2017

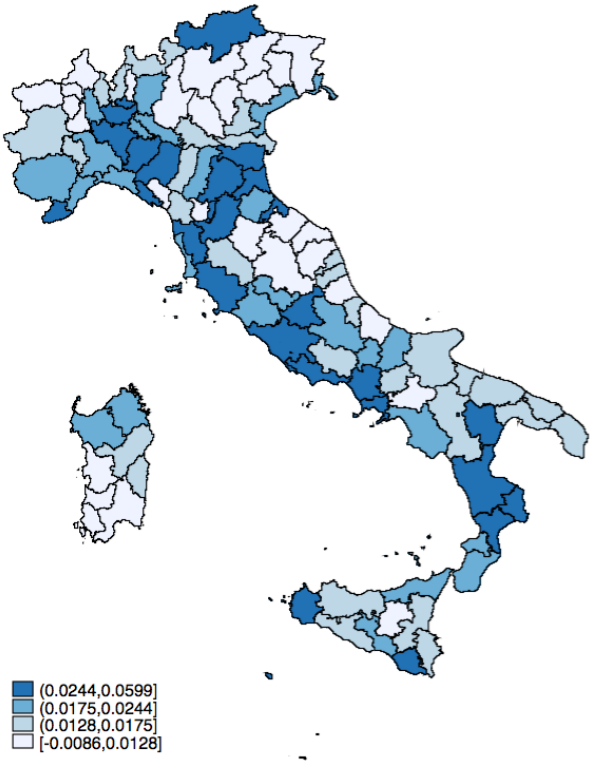


Figure 2: Change in native employment.
Administrative provinces, pooled 2009-2017

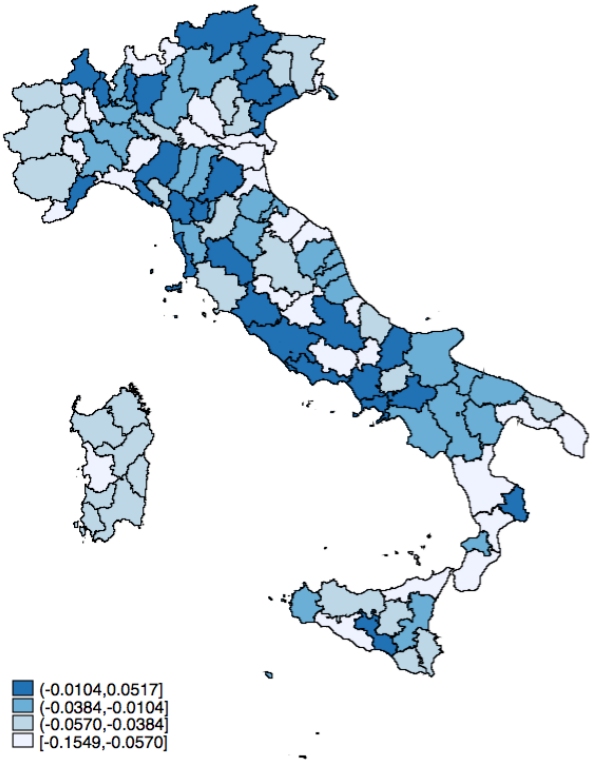
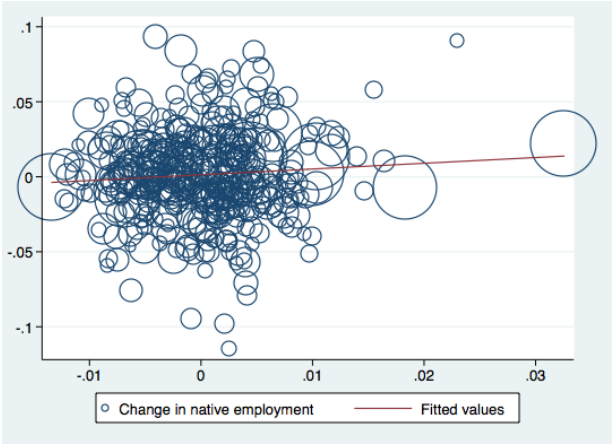


Figure 3: Change in native employment vs change in immigrant population



***Note**: The vertical axis shows the change in native employment, the horizontal axis shows the change in immigrant as share of initial population. The units of observations are the Italian administrative provinces. Variables are expressed in two-year changes and are cleaned from the time average (more details are given in the text). The size of the circle is proportional to the initial population in the province.*
$\beta = 0.429, s.e. = 0.222$

Table 1: *Pure Spatial Approach, all workers.*

Dependent variable: change in native employment normalized by initial working-age population, within education-experience groups.			
	(1) **OLS**	**(2)** **OLS**	**(3)** **2SLS**
	Baseline	**Controls**	**Controls**
$\Delta(m_{a,t})$	0.872**	1.090**	0.662
	(0.376)	(0.423)	(0.705)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.110	0.111	0.111
First-stage F stat.	-	-	15.75
Obs.	2448	2448	2448

Note*: Variables are expressed in two-years changes. The change in native employment as share of the initial working-age population within each skill-cell is the dependent variable, while the main independent one is the change in total immigrant population as share of the initial working-age population. Time by skill-cell fixed-effects are included in all specifications. Regressions are weighted by the total number of working-age individuals in each skill-cell by province at the beginning of the period. The R-squared reported in column (3) is the centered R-squared. First-stage F-statistic of column (3) lies between the 10% maximal IV size critical value (16.38) and the 15% maximal IV size critical value (8.96) of the Stock & Yogo (2005) weak ID test. Standard errors are clustered at the province level.*
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 2: *Aggregate Spatial Approach, all workers.*

Dependent variable: change in native employment normalized by initial working-age population.			
	(1) **OLS**	**(2)** **OLS**	**(3)** **2SLS**
	Baseline	**Controls**	**Controls**
$\Delta(m_{a,t})$	0.429*	0.459**	-0.070
	(0.222)	(0.220)	(0.292)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.145	0.146	0.129
First-stage F stat.	-	-	21.53
Obs.	408	408	408

Note*: Variables are expressed in two-years changes. The change in native employment as share of the initial working-age population is the dependent variable, while the main independent one is the change in immigrant population as share of the initial working-age population. Time fixed-effects are included in all specifications. Regressions are weighted by the total number of working-age individuals in the province at the beginning of the period. The R-squared reported in column (3) is the centered R-squared. First-stage F-statistic of column (3) is above the 10% maximal IV size critical value of the Stock & Yogo (2005) weak ID test. Standard errors are clustered at the province level.*
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3: *Aggregate Spatial Approach, by education.*

Dependent variable: change in native employment normalized by initial working-age population.			
Panel A: High-Educated			
	(1) **OLS**	**(2)** **OLS**	**(3)** **2SLS**
	Baseline	**Controls**	**Controls**
$\Delta(m_{a,t})$	0.527***	0.546***	0.920***
	(0.133)	(0.135)	(0.191)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.079	0.080	0.061
First-stage F stat.	-	-	21.53
Obs.	408	408	408
Panel B: Low-Educated			
$\Delta(m_{a,t})$	-0.098	-0.088	-0.989***
	(0.171)	(0.172)	(0.255)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.105	0.107	0.051
First-stage F stat.	-	-	21.53
Obs.	408	408	408

Note: *Variables are expressed in two-years changes. The change in native employment as share of the initial working-age population is the dependent variable, while the main independent one is the change in immigrant population as share of the initial working-age population. Panel A refers to high-educated individuals (i.e. people with a university degree or more), while panel B to low-educated ones (i.e. people with less than a university degree). Time fixed-effects are included in all specifications. Regressions are weighted by the total number of working-age individuals in the province at the beginning of the period. The R-squared reported in column (3) are the centered R-squared. First-stage F-statistics of column (3) are above the 10% maximal IV size critical value of the Stock & Yogo (2005) weak ID test. Standard errors are clustered at the province level.*
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4: *Aggregate Spatial Approach, by occupation.*

Dependent variable: change in native employment normalized by initial working-age population.			
Panel A: White Collars			
	(1) OLS	**(2) OLS**	**(3) 2SLS**
	Baseline	**Controls**	**Controls**
$\Delta(m_{a,t})$	0.349***	0.345***	0.265
	(0.086)	(0.098)	(0.178)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.061	0.064	0.062
First-stage F stat.	-	-	21.53
Obs.	408	408	408
Panel B: Skilled Manual & Clerks			
$\Delta(m_{a,t})$	0.250	0.277	-0.013
	(0.107)	(0.113)	(0.174)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.140	0.143	0.139
First-stage F stat.	-	-	21.53
Obs.	408	408	408
Panel C: Blue Collars			
$\Delta(m_{a,t})$	-0.132	-0.124	-0.455***
	(0.171)	(0.172)	(0.255)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.008	0.008	-0.015
First-stage F stat.	-	-	21.53
Obs.	408	408	408

Note: *Variables are expressed in two-years changes. The change in native employment as share of the initial working-age population is the dependent variable, while the main independent one is the change in immigrant population as share of the initial working-age population. Panel A refers to individuals performing a white-collar type of task, panel B to individuals performing a skilled manual type of task, and panel C refers to individuals performing a blue-collar type of task. Time fixed-effects are included in all specifications. Regressions are weighted by the total number of working-age individuals in the province at the beginning of the period. The R-squared reported in column (3) are the centered R-squared. First-stage F-statistics of column (3) are above the 10% maximal IV size critical value of the Stock & Yogo (2005) weak ID test. Standard errors are clustered at the province level.*

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

Table 5: *Aggregate Spatial Approach, by gender.*

Dependent variable: change in native employment normalized by initial working-age population.			
Panel A: Only Women			
	(1) **OLS**	**(2)** **OLS**	**(3)** **2SLS**
	Baseline	**Controls**	**Controls**
$\Delta(m_{a,t})$	0.923***	0.940***	0.227
	(0.305)	(0.329)	(0.354)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.074	0.074	0.051
First-stage F stat.	-	-	21.53
Obs.	408	408	408
Panel B: Only Men			
$\Delta(m_{a,t})$	-0.085	-0.039	-0.370
	(0.214)	(0.214)	(0.343)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.149	0.151	0.147
First-stage F stat.	-	-	21.53
Obs.	408	408	408

Note: *Variables are expressed in two-years changes. The change in native employment as share of the initial working-age population is the dependent variable, while the main independent one is the change in immigrant population as share of the initial working-age population. Panel A refers women native individuals, while panel B male natives. Time fixed-effects are included in all specifications. Regressions are weighted by the total number of working-age individuals in the province at the beginning of the period. The R-squared reported in column (3) are the centered R-squared. First-stage F-statistics of column (3) are above the 10% maximal IV size critical value of the Stock & Yogo (2005) weak ID test. Standard errors are clustered at the province level.*

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

Table 6: *Aggregate Spatial Approach. Only women, by education.*

Dependent variable: change in native employment normalized by initial working-age population.			
Panel A: High-Educated Women			
	(1) **OLS**	**(2)** **OLS**	**(3)** **2SLS**
	Baseline	**Controls**	**Controls**
$\Delta(m_{a,t})$	0.484***	0.510***	0.645***
	(0.138)	(0.142)	(0.217)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.068	0.069	0.067
First-stage F stat.	-	-	21.53
Obs.	408	408	408
Panel B: Low-Educated Women			
$\Delta(m_{a,t})$	0.423*	0.419*	-0.428
	(0.232)	(0.249)	(0.303)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.023	0.023	-0.014
First-stage F stat.	-	-	21.53
Obs.	408	408	408

Note*: Variables are expressed in two-years changes. The change in native employment as share of the initial working-age population is the dependent variable, while the main independent one is the change in immigrant population as share of the initial working-age population. Panel A refers to high-educated women, while panel B to low-educated ones. Time fixed-effects are included in all specifications. Regressions are weighted by the total number of working-age individuals in the province at the beginning of the period. The R-squared reported in column (3) are the centered R-squared. First-stage F-statistics of column (3) are above the 10% maximal IV size critical value of the Stock & Yogo (2005) weak ID test. Standard errors are clustered at the province level.*

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

Table 7: *Aggregate Spatial Approach. Only men, by education.*

Dependent variable: change in native employment normalized by initial working-age population.			
Panel A: High-Educated Men			
	(1) **OLS**	**(2)** **OLS**	**(3)** **2SLS**
	Baseline	**Controls**	**Controls**
$\Delta(m_{a,t})$	0.530***	0.547***	1.164***
	(0.145)	(0.148)	(0.211)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.042	0.043	0.005
First-stage F stat.	-	-	21.53
Obs.	408	408	408
Panel B: Low-Educated Men			
$\Delta(m_{a,t})$	-0.615***	-0.585***	-1.534***
	(0.188)	(0.208)	(0.326)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.152	0.154	0.125
First-stage F stat.	-	-	21.53
Obs.	408	408	408

Note: *Variables are expressed in two-years changes. The change in native employment as share of the initial working-age population is the dependent variable, while the main independent one is the change in immigrant population as share of the initial working-age population. Panel A refers to high-educated men, while panel B to low-educated ones. Time fixed-effects are included in all specifications. Regressions are weighted by the total number of working-age individuals in the province at the beginning of the period. The R-squared reported in column (3) are the centered R-squared. First-stage F-statistics of column (3) are above the 10% maximal IV size critical value of the Stock & Yogo (2005) weak ID test. Standard errors are clustered at the province level.*
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8: *Multiple Instrumentation Procedure, all workers.*

Dependent variable: change in native employment normalized by initial working-age population.			
Panel A: Pure Spatial Approach			
	(1) OLS	**(2) OLS**	**(3) 2SLS**
	Baseline	**Controls**	**Controls**
$\Delta(m_{a,t})$	0.835**	1.004***	0.626
	(0.353)	(0.377)	(0.714)
$\Delta(m_{a,t-1})$	-0.653***	-0.544**	-0.382
	(0.214)	(0.222)	(0.448)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.112	0.112	0.112
First-stage F stat.	-	-	3.26
Obs.	2448	2448	2448
Panel B: Aggregate Spatial Approach			
$\Delta(m_{a,t})$	0.429*	0.463**	-0.067
	(0.225)	(0.225)	(0.281)
$\Delta(m_{a,t-1})$	0.057	0.074	0.336
	(0.122)	(0.123)	(0.248)
Bartik	NO	YES	YES
Internal migration	NO	YES	YES
R^2	0.145	0.146	0.122
First-stage F stat.	-	-	21.53
Obs.	408	408	408

Note*: Panel A refers to the pure spatial approach. The units of observations are skill-cells at the province level. Skill-cells are three education by two experience groups as defined in the text. Variables are expressed in two-years changes. The change in native employment as share of the initial working-age population within skill-cells is the dependent variable, while the main independent ones are the change in immigrant population as share of the initial working-age population and its lag. Time by skill-cells fixed-effects are included in all specifications. Regressions are weighted by the total number of working-age individuals in each skill-cell by province at the beginning of the period. The R-squared reported in column (3) is the centered R-squared. First-stage F-statistic of column (3) is lower than the 25% maximal IV size critical values of the Stock & Yogo (2005) weak ID test.*
Panel B refers instead to the aggregate spatial approach. The units of observations are administrative provinces. Variables are expressed in two-years changes. The change in native employment as share of the initial working-age population is the dependent variable, while the main independent ones are the change in immigrant population as share of the initial working-age population and its lag. Time fixed-effects are included in all specifications. Regressions are weighted by the total number of working-age individuals in the area at the beginning of the period. The R-squared reported in column (3) are the centered R-squared. First-stage F-statistic of column (3) is above the 10% maximal IV size critical value of the Stock & Yogo (2005) weak ID test.
In both panels, standard errors are clustered at the province level.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 9: *Regional Level Analysis, whole population.*

Dependent variable: Change in native employment normalized by initial working age population							
	Pure Spatial	Aggregate Spatial					
	(1) All Workers	**(2) All Workers**	**(3) High Educ.**	**(4) Low Educ.**	**(5) White Coll.**	**(6) Skilled Man.**	**(7) Blue Coll.**
$\Delta(m_{a,t})$	1.637***	0.325	0.881***	-0.556	0.384**	0.136	-0.138
	(0.716)	(0.441)	(0.220)	(0.370)	(0.156)	(0.373)	(0.218)
Centered R^2	0.438	0.463	0.305	0.368	0.213	0.493	0.003
First st. F-stat	29.46	35.31	35.31	35.31	35.31	35.31	35.31
Obs.	480	80	80	80	80	80	80

Note*: The units of observations administrative regions. Variables are expressed in two-year changes. In Column (1) refers to the pure spatial approach as presented in equation 1, where the dependent variable is the change in native employment as share of the initial working-age population within skill-cells. Columns (2) to (8) refer instead to the aggregate spatial approach introduced in equation 4, where the dependent variable is the total change in native employment as share of the initial working-age population. In all columns, the main independent variable is the change in immigrant population. All columns presents results relative to the 2SLS procedure using the shift-share instrument and including as control variables the Bartik instrument and the net migration rate and are relative to a different sample of the native population, as indicated at the top of each column. In column (1) the regression is weighted by the total number of working-age individuals in each skill-cell by region at the beginning of the period, In columns (2) to (8) regressions are instead weighted by the total number of working-age individuals in the region at the beginning of the period. All first-stage F-statistics reported are above the 10% maximal IV size critical value of the Stock & Yogo (2005) weak ID test. Standard errors are clustered at the region level.*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10: *Regional Level Analysis, by gender.*

Dependent variable: Change in native employment normalized by initial working age population						
	Women			**Men**		
	(1) All Women	**(2) High Educated**	**(3) Low Educated**	**(4) All Men**	**(5) High Educated**	**(6) Low Educated**
$\Delta(m_{a,t})$	0.388	0.756**	-0.107	-0.114	0.894***	-1.008**
	(0.261)	(0.261)	(0.413)	(0.539)	(0.345)	(0.445)
Centered R^2	0.239	0.312	0.104	0.503	0.110	0.503
First st. F-stat	35.31	35.31	35.31	35.31	35.31	35.31
Obs.	80	80	80	80	80	80

Note*: The units of observations are administrative regions. Variables are expressed in two-year changes. The change in native employment is the dependent variable. Columns (1) to (3) present results relative to women, while columns (4) to (6) relative to men. All columns presents results relative to the 2SLS procedure using the shift-share instrument and including as control variables the Bartik instrument and the net migration rate and are relative to a different sample of the native population, as indicated at the top of each column. Regressions are weighted by the total number of working-age individuals in the region at the beginning of the period. All first-stage F-statistics reported are above the 10% maximal IV size critical value of the Stock & Yogo (2005) weak ID test. Standard errors are clustered at the region level.*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A Appendix

Provinces

In order to have a homogeneous dataset over the period analyzed and due to changes in the definition of some provinces, we have merged together the following provinces:

- Monza e della Brianza with Milano.
- Fermo with Ascoli Piceno.
- Foggia & Barletta-Andria-Trani with Bari.
- Olbia-Tempio with Sassari.
- Ogliastra with Nuoro.
- Medio Campidano & Carbonia-Iglesias[23] with Cagliari.

Industries

In order to homogenize the data relative to the industries classification, we have constructed 46 new industries that are defined as follows:

Table A1: *Industries Classification.*

Industry in the Paper	**Ateco 2002 LFS 2009**	**Ateco 2009 LFS 2011 onwards**
1	ate2d=1	ate2d=1
2	ate2d=2	ate2d=2
3	ate2d=5	ate2d=3
4	ate2d=10, 11, 12, 13, 14	ate2d=5, 6, 7. 8. 9
5	ate2d=15	ate2d=10, 11
6	ate2d=16	ate2d=12
7	ate2d=17, 18, 19	ate2d=13, 14, 15
8	ate2d=20	ate2d=16
9	ate2d=21	ate2d=17
10	ate2d=22	ate2d=18, 58
11	ate2d=23	ate2d=19
12	ate2d=24	ate2d=20, 21
13	ate2d=25	ate2d=22
14	ate2d=26	ate2d=23
15	ate2d=27	ate2d=24
16	ate2d=28, 29, 30, 31, 32, 33	ate2d=25, 26, 27, 28, 33
17	ate2d=34	ate2d=29
18	ate2d=35	ate2d=30
19	ate2d=36	ate2d=31, 32

[23] In the LFS of the first quarter of 2017 these two provinces are merged together under the name "Sud Sardegna".

Table A1: *Industries Classification (Continued).*

Industry in the Paper	**Ateco 2002 LFS 2009**	**Ateco 2009 LFS 2011 onwards**
20	ate2d=40	ate2d=35
21	ate2d=41	ate2d=36
22	ate2d=37, 90	ate2d=37, 38, 39
23	ate2d=45	ate2d=41, 42, 43
24	ate2d=50	ate2d=45
25	ate2d=51	ate2d=46
26	ate2d=52	ate2d=47, 95
27	ate2d=60	ate2d=49
28	ate2d=61	ate2d=50
29	ate2d=62	ate2d=51
30	ate2d=63	ate2d=52
31	ate2d=64	ate2d=53, 61
32	ate2d=55	ate2d=55, 56
33	ate2d=92	ate2d=59, 60, 90, 91, 92, 93
34	ate2d=72	ate2d=62, 63
35	ate2d=65	ate2d=64
36	ate2d=66	ate2d=65
37	ate2d=67	ate2d=66
38	ate2d=70	ate2d=68
39	ate2d=73, 74	ate2d=69, 70, 71, 72, 73, 74, 78, 80, 81, 82
40	ate2d=85	ate2d=75, 86, 87, 88
41	ate2d=71	ate2d=77, 79
42	ate2d=75	ate2d=84
43	ate2d=85	ate2d=85
44	ate2d=94, 96	ate2d=94, 95
45	ate2d=97, 98	ate2d=97, 98
46	ate2d=99	ate2d=99

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