Do Immigrants Compete with Natives in the Greek Labour Market? Evidence from the Skill-Cell Approach Before and During the Great Recession

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Do Immigrants Compete with Natives in the Greek Labour Market? Evidence from the Skill-Cell Approach Before and During the Great Recession*

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Abstract: This study applies the skill-cell approach introduced by Borjas (2003) in order to identify the causal impact of immigration on the employment opportunities of resident workers, using data from two different samples, namely two waves of the Census of Population (1991 and 2001) and the Greek Labour Force Survey (1998-2015). Grouping workers in three education and eight experience classes at the national level, we find small adverse effects on the employment outcomes of natives, that are generally not sensitive to alternative education and experience classifications and when accounting for the effective experience of immigrants. However, as for the period between 1998 and 2015, our findings appear to be driven by the negative influence of immigration ascertained in the sub-period during the Great Recession. Remarkably, there is some evidence of complementarity when the pre-recession period (1998-2007) is considered. The less-skilled natives, appear to be the group of workers which is more vulnerable to immigration. Our results also indicate that the Greek economy has the capacity to accommodate large immigration flows in the long-run, without significant effects. Finally, contrary to earlier studies, we do not find evidence consistent with the idea that migrants push natives towards complex, language-intensive tasks.

JEL: Immigration employment, earnings

Keywords: F22, J15, J31

*The main data used in this paper can be accessed through EUROSTAT and ELSTAT. We would like to thank Maarten Goos, Alan Manning and Anna Salomons for generously giving us access to their data on task measures.
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"Population must always be kept down to the level of the means of subsistence."

Thomas Malthus, An Essay on the Principle of Population (1798)

1. Introduction

According to the surveys conducted by Scheve and Slaughter (2001) and Gang, Rivera-Batiz and Yun (2002), the less-skilled natives in the United States and Europe are more likely to stand in favour of policies aiming at limiting the number of migrants, because they anticipate that foreign-born competitors will depress their wages or take their jobs[4]. More recently, the global recession and the refugee crisis of 2015 has revived Malthusian fears and further fueled negative sentiments against migrants among native workers. Likewise, the public debate over immigration has heated up in recent years in Greece, as national unemployment rate has reached a record high since the onset of the crisis, while at the same time thousands of migrants seeking to move towards Western Europe are trapped in the country.

As one might expect, most research focuses on the effects of immigration on traditional migration countries in North America (Australia, Canada, United States) and Europe (France, Germany, UK). There is also a growing literature in more recent immigration countries (Italy, Spain)[5]. The main message conveyed by the vast empirical literature is that the effects of immigration are close to zero (see e.g. Longhi, Nijkamp and Poot, 2005; Card, 2009). A notable exception involves the recent work of Borjas (2003, 2014, 2015) and Borjas, Grooger and Hanson (2012) who report large adverse effects on the earnings of the less-skilled natives.

Surprisingly, little attention has been devoted to this subject in Greece, although the country has experienced very large immigration flows since the end of socialism in Eastern European countries in the late 1980s[6]. Specifically, the first major immigration episode took place in 1990

[4] On the other hand, Hainmueller and Hiscox (2007) find that the negative attitudes of natives towards immigration are driven by racial prejudice rather than due to fears about labour market competition. This finding is consistent with the empirical literature that shows that the effect of immigration on the labour market outcomes of natives is negligible.

[5] See section 3 for a brief view of this literature.

[6] We are aware about two simulation-based studies. Sarris and Zografakis (1999) using a computable general equilibrium approach show that illegal migrants adversely affect the real disposable incomes of households headed by an unskilled person. By contrast, they find that households that are headed by skilled workers or by inactive individuals

where mostly unskilled immigrants driven by push factors, mainly from Albania, Bulgaria, Romania, Georgia, Russia and Ukraine entered the country. The second massive wave of immigrants occurred in 1997 with the collapse of the pyramid schemes in Albania. Immigration then continued with undiminished intensity during the 2000s until the global credit crunch ended abruptly a long period of economic expansion in 2008 and eventually stabilized the number of migrants in the country.

Greece offers a unique environment for examining how immigration can affect the labour market outcomes of natives. First, the Greek labour market abounds in institutional features (i.e. minimum wage laws, rigid wage bargaining, strict employment protection regulations, inflexible working time arrangements), that prevent wages from adjusting downwards in response to supply and demand shocks (OECD, 2011)[7]. Past research of Western European countries revealed, contrary to the general perception, that more flexible labour laws prevent wage losses via positive reallocation of natives towards more complex and language intensive tasks, complementary to manual intensive tasks where immigrants have comparative advantage (e.g. D' Amuri and Peri, 2014)[8]. What is more, the Greek product market is also characterized as over-regulated (IMF, 2013) and it is well-known that barriers to entry, excess bureaucracy and other impediments to "ease of doing business" are associated with greater adverse effects of immigration (e.g. Angrist and Kugler, 2003). Hence, we these issues in mind, the first question we seek to answer is: How does a rigid by international comparison labour and product market absorb an immigration induced labour supply shock?

such as pensioners benefit from illegal immigration. Chassamboulli and Palivos (2013) employing a search and matching framework report evidence that immigration generates gains for skilled natives in terms of wages and employment, while its impact on unskilled natives is ambiguous.

[7] Evidence of limited wage flexibility in Greece is also reported by Clar, Dreger and Ramos (2007), Babecky, Du Caju, Kosma, Lawless, Messina and Rõõm (2010), Fabiani, Kwapil, Rõõm, Galuscak and Lamo (2010). On the other hand, Livanos (2008) provides empirical evidence that contradicts with the policy recommendations of the OECD, i.e. wages are not rigid.

[8] Note that standard economic theory implies that the short-run adjustment to immigration in flexible labour markets involves changes in wages rather than in employment. By contrast, if wage flexibility is limited, one would expect significant adverse effects on the employment of competing natives.

Furthermore, Greece, contrary to other traditional immigration attracts very few high-skilled[9] migrants and is the only EU country where almost 45% of immigrants stem from a single country, namely Albania. It is well-documented in the literature that if immigrants are over-represented in one skill group relative to natives, this group losses in terms of wages and employment (see e.g. Gaston and Nelson, 2000; Dustmann, Fabbri and Preston, 2005; Card, 2009). On top of that, lower cultural and birthplace diversity may also result in smaller benefits in terms of complementarity and productivity (see e.g. Ottaviano and Peri, 2006; Alesina, Harnoss and Rapopor, 2016). Based on these considerations, the second question we investigate is: Do the less-skilled natives bear the potential costs of immigration in Greece?

Third, after Greece adopted the euro in 2001, low interest rates stimulated economic growth, but at the same time, the imprudent borrowing eventually resulted in losing capital market access in 2009. Consequently, Greece entered into a prolonged depression and successive economic adjustment programmes with EU, ECB and IMF. While past research has shown that host countries have the capacity to absorb immigration in good times without losses in terms of wages and employment (see. e.g. Card, 2009; Peri and Sparber. 2009), few studies have analyzed the short-run consequences of immigration during contraction. Hence, the third question we ask is: Does the impact of immigration on the labour market opportunities of natives depend on the stage of the business cycle during which is examined?

Fourth, taking advantage of the fact that the first important immigration episodes, which took place in the 1990s, resemble, to a large extent, a natural experiment, and the Greek economy was unprepared to absorb large and sudden migration waves, we ask whether the impact of migration is more substantial during the earlier phases.

Finally, contrary to other traditional migration countries, Greece exhibits pronounced segmentation between a formal and an informal sector[10]. The former offers complex, non-manual

[9] According to the EULFS, the skilled-unskilled ratio is 1.6. for natives and 3.4 for immigrants.
[10] The widely cited study by Schneider and Enste (2000) estimates that the informal economy in Greece is about 29.6 percent of GDP.

jobs, but at the same time, there is limited access for the outsiders, because of legally imposed entry barriers by the insiders. By contrast, the informal sector is unregulated and offers low-paid, non-complex jobs. With these issues in mind, the fifth question we seek to address is whether the positive reallocation of natives towards more complex jobs, recently proposed in the literature, can be ascertained for the case of Greece.

Thus, the main objective of the present paper is to address these questions and contribute to the European literature by presenting empirical evidence on an unresolved issue, focusing on a country characterized by institutional features that prevent labour market clearing. To this end we employ the national or skill-cell approach introduced by Borjas (2003), using the latest available data from the Greek Labour Force Survey (GRLFS). The GRLFS sample covers the period between 1998 and 2015. In addition, we use Census data for 1991 and 2001 from IPUMS-I (2015). We then *slice* the Greek labour market into education and work experience segments and examine the short-run, partial effect of immigration on the labour market opportunities of the native workforce, by regressing four measures of employment and earnings on year-to-year variation in immigrant share across skill-cells. Contrary to earlier studies of immigration, the skill-cell analysis is a robust way to identify the causal impact of immigration, as long as the participation of natives across cells is unaffected by the presence of immigrants. Finally, we also control for the possibility that the pre-immigration labour market experience is not valued in the Greek labour market.

Our main results can be summarized as follows. Overall, immigration appears to deteriorate the employment opportunities of natives either when the Census or the GRLFS data are used. By contrast, there is no significant correlation between natives' earnings and migrants. These findings survive several robustness tests. Yet, when splitting our GRLFS sample in two (1998-2007 and 2008-2015), there is stark contrast in the results. In particular, there is robust evidence that immigration deteriorates the labour market opportunities of natives, during the period of the Great Recession. At the same time, we find evidence of complementarity for the pre-recession period. We also provide empirical evidence that in the long-run (i.e. after 10 years) the impact of

immigration dissolves. Finally, the national approach indicates, contrary to previous studies, that immigrants do not trigger a positive reallocation of natives towards complex jobs. By contrast, we find evidence that natives move towards routine-intensive tasks.

The remainder of the paper is organized as follows: In the next Section we offer some key statistics about immigration in Greece. In Section 3 we present the theoretical considerations and make a detailed review of the relevant empirical literature. Section 3 describes the data. In Section 4 we discuss the methodology followed in order to estimate the impact of immigration. Section 5 offers evidence about the occupational distribution of immigrants and natives. Sections 6-9 report and discuss the main empirical results of the skill-cell analysis. Finally, Section 10 concludes the paper.

2. Immigration in Greece.

Since the end of 1980s, push (the collapse of the Communist regimes in Eastern Europe) and pull factors (economic stability until 2008) transformed Greece from an emigration to an immigration country. According to Population Censuses, the share of immigrants in Greece has increased rapidly, rising from 1.6% in 1991 to 9.2% in 2011. The largest group of foreign-born citizens in 2011 was citizens of Albania (480 thousand), followed by citizens of Bulgaria (76 thousands), Romania (47 thousand), Pakistan (34 thousand) and Georgia (27 thousand).

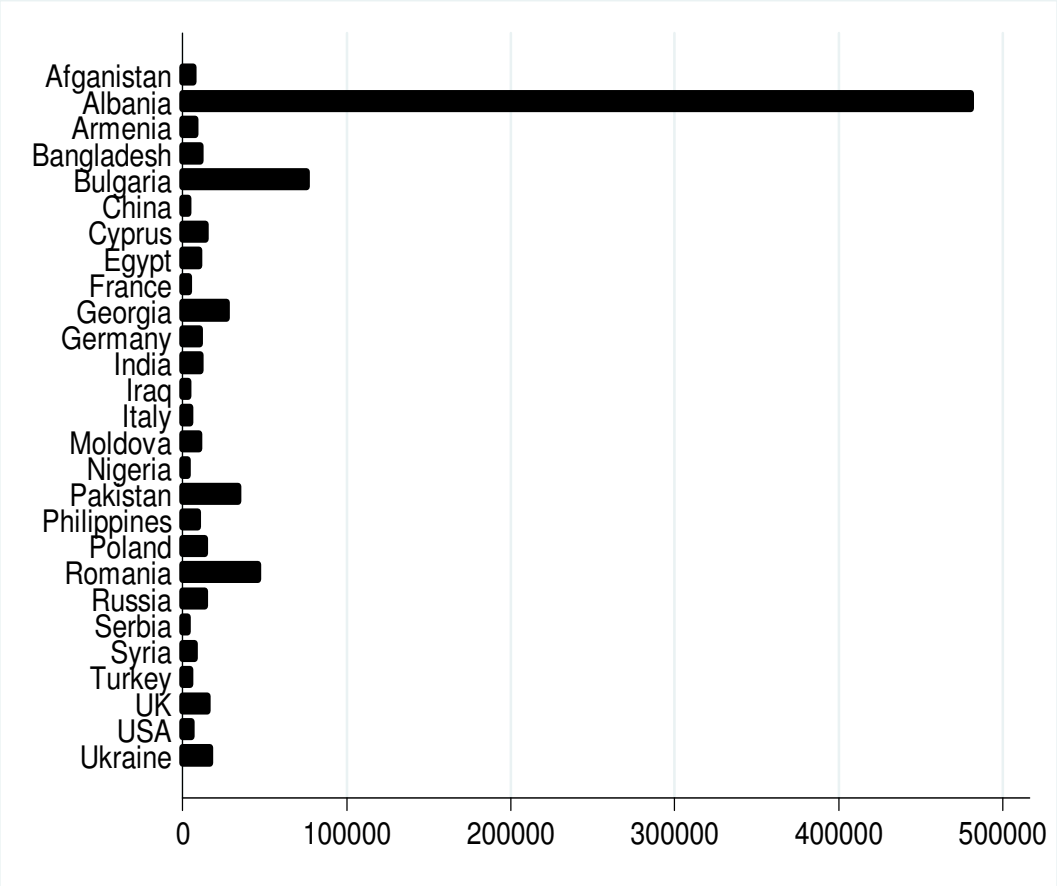


Figure 1. Foreign-born population by country of birth. Source: Population Census 2011

Figure 2 reports the immigrant share in the labour force (age 15-64) in the 13 administrative regions of Greece. As can be seen, immigrant workers are concentrated predominantly in few regions, namely Attiki, Central Macedonia, Crete and South Aegean. In the top immigration region, Attiki, for every 100 native-born labour force participants there are about 15 foreigners. On the other hand of the spectrum, the share of immigrants on total labour force falls below 5% in Western Macedonia.

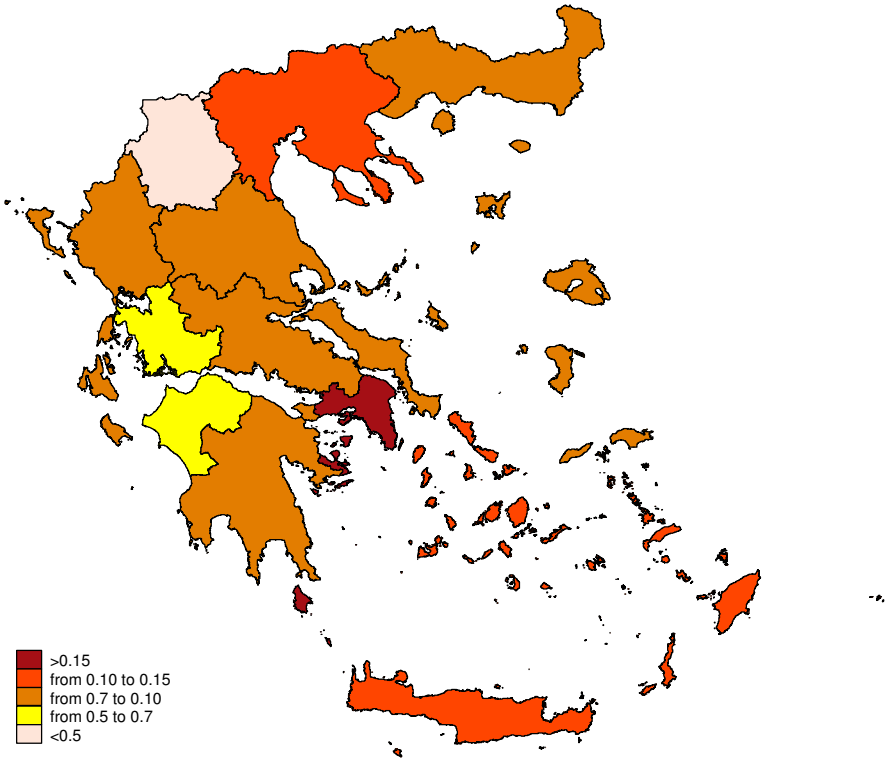


Figure 2. Spatial distribution of immigrants in Greek administrative regions (2015). Authors' calculations on GRLFS data

Greece is somewhat different from many other immigration countries in terms of the education distribution of its immigrants. According to the GRLFS, roughly half of immigrants (48%), are concentrated in the lowest level of educational spectrum, that is, lower secondary education or below, compared to 37% of native population. On the other hand, the share of immigrants with university education (14%) falls short of the native share (24%). As can be seen in Figure 3, in 2015, foreign-born workers constitute about 20% of the labour force of the less-skilled workers, about double the share of total workforce. By contrast, the immigrant share on medium-skilled labour force is near the average, while it falls below as far as the high-skilled workforce is concerned.

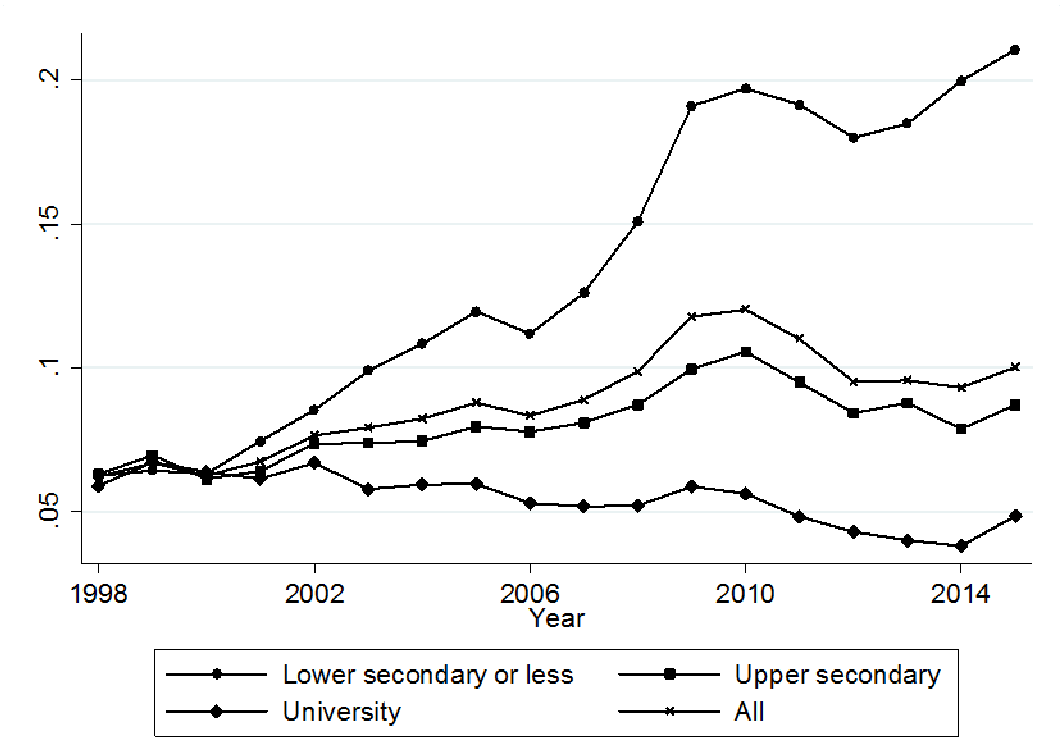


Figure 3. Immigrant share in total labour force by education group

Figure 4 depicts the evolution of the intensity of routine vs complex tasks for the average native worker and two groups of immigrants, defined according to their years of residence in Greece, namely recent and veteran immigrants. As can been easily verified, natives specialize in more complex tasks relative to immigrants. What is more, consistent with the hypothesis that immigrants specialization differs with language proficiency, the figure suggests that recent immigrants are involved in more manual, routine-intensive tasks than veteran immigrants.

The Appendix Table A1 offers pairwise correlations between experience and education dummies and four task measures, namely routine task intensity, abstract, routine and service task importance[11]. The correlation with the experience dummies, albeit is very low, suggests that the intensity of routine vs complex tasks declines with years of work experience. On the other hand, there is a strong negative correlation between the relative intensity and the high education dummy.

[11] Routine tasks require repetitive physical strength or non-complex cognitive skills. Abstract tasks are complex problem solving. Service tasks are non-routine tasks, usually performed by workers with lower levels of education. See Goos, Manning and Salomons (2010) for further details.

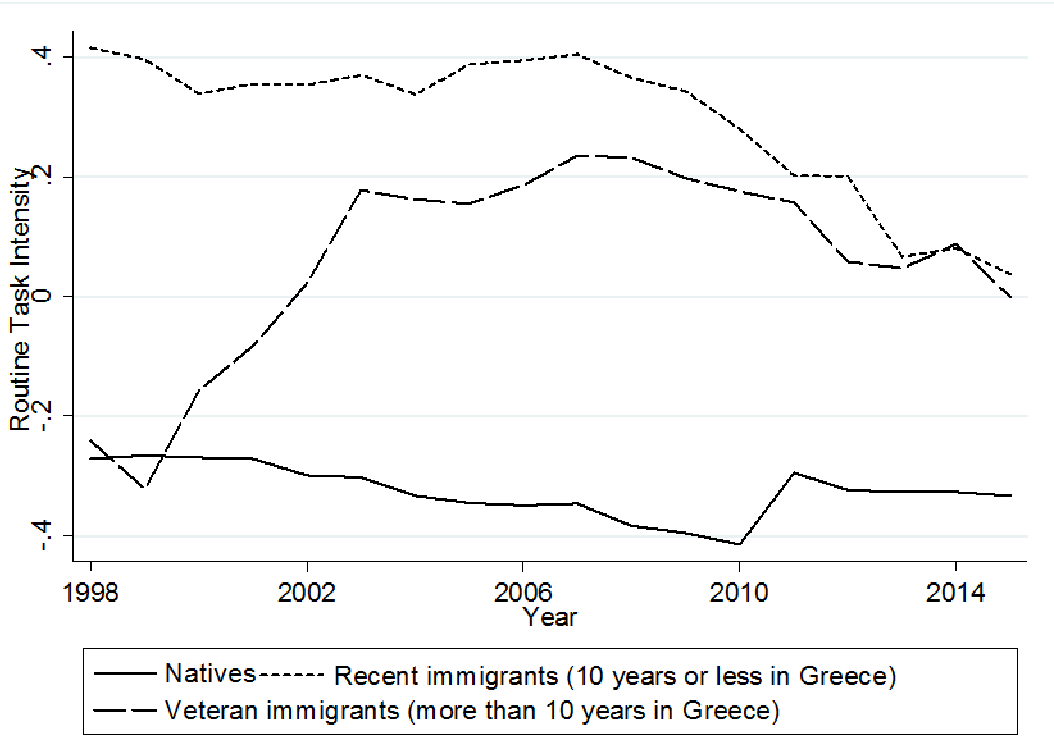


Figure 4. Routine task intensity, natives and immigrants. Authors' calculations on GRLFS data matched with data reported by Goos, Manning and Salomons (2010). Routine task intensity is defined as Routine task importance divided by the sum of Abstract and Service task importances

2. Theoretical considerations and previous literature

In this section, we discuss the mechanisms proposed in the economic literature by which immigration can affect the labour market opportunities of native-born population[12]. As is common, we distinguish between first-round and second-round effects. The former entails the short-run adjustments to immigration, based on the canonical model of the labour market, while the latter refers to a set of secondary adjustments (i.e. specialization of natives in communication and cognitive intensive tasks, capital responses, changes in output mix, internal migration). We also review the relevant empirical literature on the labour market impact of immigration.

The standard textbook model of the labour market, assuming labour homogeneity, predicts that immigration lowers the earnings of natives of comparable education, pushing some of them out of the labour force, because at the new equilibrium the offered wage falls below their reservation

[12] For extensive reviews of the literature, see Borjas (1994); Friedberg and Hunt (1995), Okkerse (2008) among others.

wage[13]. When there is skill diversity within native and foreign-born population, the impact of immigration depends on whether it changes the balance of skills in the host country. For instance, if the ratio of unskilled versus skilled immigrants is higher than that of natives, immigration is expected to exert a negative influence on the labour market outcomes of the less-skilled natives. By contrast, the high-skilled gain from immigration in terms of wages and employment (see e.g. Alntonji and Card, 1991; Gaston and Nelson, 2000; Dustmann, Fabbri and Preston, 2005, Card, 2009).

However, there are several channels through which the less-skilled native-born individuals can protect themselves from immigrant competitors in the long-run. First, the seminal paper of Peri and Sparber (2009) provides theoretical and empirical evidence for the United States that the most vulnerable group of natives (i.e. the less-skilled) respond to immigration by moving into occupations that require communication skills where they have comparative advantage. At the same time, immigrants with the same educational attainment concentrate in occupations that require manual skills. Consequently, the imperfect substitutability between natives and immigrants implies lower losses than those implied by the canonical model of labour supply and demand. Likewise, D'Amuri and Peri (2014) report positive reallocation of natives towards occupations requiring more abstract and complex skills in a panel of 15 Western European countries for the 1996-2010 period. This process however, is found to be slower during the Great Recession, that is, between 2007 and 2010. What is more, Amuedo-Dorantes and de la Rica (2011), and Ortega and Verdugo (2014) also find evidence in favor of occupational upgrading of natives due to immigration in Spain and France respectively. Apart from the positive occupational allocation, natives also tend to acquire more education in response to immigration. Skill upgrading means that natives avoid competition with immigrants and less pronounced wage pressures (e.g. Hickman and Olney, 2011; Hunt, 2012).

[13] Johnson's (1980) elaborate model implies that the magnitude of the effects of immigration depends upon the degree of elasticity of labour supply and demand. When the labour supply or the labour demand are more elastic, wages and employment are expected to change less.

Second, Ottaviano and Peri (2005, 2008, 2012) emphasize on the importance of physical capital adjustment. Initially, the decline in capital-labour ratio drives wages down. However, the higher profitability of capital in the short-run attracts investments and hence attenuates the first-round effects of immigration. The degree of capital mobility determines the extent at which wages are restored to the pre-immigration levels. Besides that, product market flexibility is also crucial, since barriers to entry deter new entrants and are expected to aggravate the negative effects of immigration on natives (see e.g. Angrist and Kugler, 2003).

Third, immigrants except for workers are also consumers and increase the demand for domestic goods and services. In this context, immigrants' participation in the goods market increases the prices of domestic goods, thereby creating their own demand for labour and hence damping the adverse effects implied by the standard labour market model. (see e.g Hercowitz and Yashiv 2002; Bodvarsson, Van den Berg and Lewer, 2008).

Fourth, immigrants are generally considered to accept lower wages either because of lower bargaining power (see e.g. Battisti, Felbermayr, Peri and Poutvaara, 2014) or due to lower reservation wage (see e.g. Constant, Krause, Rinne and Zimmermann, 2010). This stylized fact encourages firms to create more jobs since it lowers the expected wage they have to pay and mitigates the initial adverse effects of the supply shock (see e.g. Chassamboulli and Palivos, 2013).

A fifth adjustment mechanism involves the absorption of the supply shock through changes in output mix rather than changes in factor prices (Rybczynski Theorem, 1955). Most studies however, find no empirical evidence that immigration causes changes in industry mix. Instead, they document that industries respond to migration by using unskilled labour more intensively (see e.g. Lewis, 2003; Dustmann and Glitz 2008; Gonzalez and Ortega, 2011).

Last and less important, there is some evidence in the United States that natives respond to immigration by moving into cities with lower immigration rates. By moving out, natives counterbalance the supply shock induced by immigrants and hence mitigate the initial negative effects on their employment opportunities. The empirical literature in this field produces conflicting

results. On the one hand, this prediction is supported by Frey (1995) and Borjas (2006) who find a significant positive correlation between immigrant inflows and native outflows. On the other hand, Card and DiNardo (2000) and Card (2001) document that intercity mobility rates of natives are not sensitive to immigration[14]. Instead, they report evidence that natives and immigrants are attracted by the same cities.

Beginning with Grossman's (1982) seminal paper, there is a vast empirical literature examining the above theoretical considerations. Since the early 2000s, the spatial correlations approach pioneered by Altonji and Card (1991) used to be the dominant method in identifying the causal relationship between natives labour market outcomes and immigration. Spatial correlations build on the assumption that the host economy can be divided in two regional labour markets, and that only one of the two receives immigrants who are perfect substitutes for natives. The impact of immigration is then measured by comparing the labour market performance of natives between the regions (e.g. Bodvarsson and van den Berg, 2013). Empirically, this is done by regressing labour market outcomes (wages, employment, participation and so forth) on regional variation of the immigrant share.

However, spatial correlations are often criticized for suffering from endogeneity. The fact that immigrants tend to cluster into regions with booming economic conditions can be a confounding factor for negligible effects reported by such studies (see e.g. Borjas, 1994 and 2003)[15]. To address this issue, most studies employ an instrumental variables approach using lagged immigrant concentrations. The idea is that immigrants tend to go in the same cities as old co-nationals (Bartel, 1989). Hence, this strategy aims to isolate the exogenous (supply-push) component of immigration in order to capture its causal relationship with the relevant measures of labour market outcomes of

[14]As for Europe, Pischke and Velling (1997), and Glitz (2012) find that native outflows are not associated with higher immigration in German counties. Likewise, little evidence for inter-regional mobility of natives is reported by Hatton and Tani (2005) for the UK.

[15] A second problem of the spatial correlations is that natives may respond to immigration from abroad by moving out from regions with high immigrant concentrations. However, as we discussed earlier in this section, most of the empirical studies do not find evidence consistent with this hypothesis.

natives. Nevertheless, even when controlling for endogeneity, the majority of the spatial correlations studies fail to detect large adverse effects on resident workers (see e.g. Altonji and Card, 1991; LaLonde and Topel, 1991; Pischke and Velling, 1997; Card, 2001; Lewis, 2003; Dustmann, Fabbri and Preston, 2005; Gonzalez and Ortega, 2011)[16].

Borjas (2003) introduces a new methodological approach to measure the labour market impact of immigration that is not contaminated by the endogeneity bias of the spatial correlations. Instead of using regional variation of migrant concentrations, Borjas focuses on the national labour market and groups workers in education and experience cells[17]. Hence, this method excludes the possibility that immigrants are self-selected into cells where wages or the probability of employment are higher, since only educational upgrading allows workers to switch between skill-cells. What is more, individuals are perfect substitutes within education groups unless they belong to different experience groups. On the other hand, workers with the same educational attainment are imperfect substitutes as long as they possess different levels of labour market experience. Borjas using Census data for the 1960-2000 period finds that a 10% rise in immigration reduces on average weekly earnings by about 4%. Estimations within schooling groups imply large adverse effects on those workers with at most high school education and positive effects on college graduates.

Nevertheless, this methodology is not immune to criticism. Ottaviano and Peri (2012) challenged Borjas findings by allowing for imperfect substitutability across and within skill-cells. They also focus on the long-run effects of immigration by allowing full capital stock adjustment to

[16] Some other studies deal with endogeneity by looking at natural experiments, that is, exogenous, supply push immigrant inflows. For instance, Card (1990) analyzes the impact of Cuban immigrants in Miami. Another examples are Algerian "repatriates" in France (Hunt, 1992), Russian immigrants in Israel (Friedberg, 2001), "retornados" from African colonies in Portugal (Carrington and de Lima, 1999). Although migration is driven by political changes in the source countries in all instances, these studies also report negligible effects on the labour market performance of resident workers. Recently, Borjas (The wage impact of Marielitos: A Reappraisal, forthcoming at the Industrial and Labor Relations Review) re-evaluates the impact in Miami labour market and finds evidence that contradicts with Card's conclusions. More precisely, he concludes that the average drop experienced by the less-skilled Miamians was between 10 and 30 percent.

[17] Some other studies *slice* the national labour market in occupations instead of education-experience cells. See for instance, Friedberg (2001) and Orrenius and Zavodny (2007).

restore the capital-labour ratio in the wage simulations. In this framework, Ottaviano and Peri find a positive effect on native wages and a negative effect on the wages of previous immigrants.

Regarding empirical evidence from skill-cell analysis for European labour markets, Bonin (2005) finds small wage effects and no employment effects on native workers in the German labour market. Carrasco, Jimenez and Ortega (2008) find no significant effects in Spain for the second half of the 1990s. Likewise, D' Amuri, Ottaviano and Peri (2010) investigating the impact of immigration in Western Germany for the 1987-2001 period find little evidence of adverse effects on natives. Instead, they report large adverse employment effects on previous immigrants. Manacorda, Manning and Wadsworth (2012) find evidence of imperfect substitution between immigrants and natives within age-education cells in the UK. Ortega and Verdugo (2014) report positive effects of immigration on the wages and employment of resident workers on the French labour market, partially explained by the positive re-allocation of natives towards communication and cognitive intensive tasks.

3. Data

Our examination of the impact of immigration on the labour market outcomes of natives relies on data from two different samples. Firstly, we use data from two waves of Census of Population for 1991 and 2001. Secondly, we employ data from the GRLFS. The time period used in the estimation consists of 18 years span from 1998-2015. The dependent variables are the log of monthly wage[18][19], deflated to 2010 euros by using the CPI series, the unemployment to labour force ratio, the employment to population ratio and the weekly average hours worked[20]. When we aggregate for the employment variables and immigration share, we use the personal weight

[18] We follow Borjas (2003) and Borjas, Grogger and Hanson (2012) and take the mean of the log wages of natives when aggregating the LFS data for native workers instead of the log of the average wages.
[19] Since the GRLFS asks individuals to report their wage in bands, rather than precise figures, we follow the common practice and use the median wage per band in our estimations. For some recent applications with GRLFS wages see among others Livanos (2008) and Christopoulou and Monastiriotis (2014, 2016).
[20] Employment to population ratio and unemployment to labour force are calculated using the EULFS variable *ilostat*. Average hours worked are given by the variable *hwactual*.

provided by the GRLFS (variable *COEFF*). As for wages, we pre-multiply the personal weight provided by the GRLFS by the actual number of weekly hours worked (variable *or_rR*) and then we take the weighted average across skill-cells using the above product as the weight.

The analysis is carried out employing data on male individuals aged 15-64. We classify natives into three education categories, those with lower secondary education or below, those with upper secondary educational attainment, and college graduates. As it is common in the relevant literature we define immigrants all those individuals born outside Greece. Labour market experience is calculated as age minus age of entry in the labour market[21]. We assume that individuals with lower secondary education or below, secondary education, university education, post-tertiary education enter the labour market at 17, 19, 23 and 27 years of age respectively. Following Borjas (2003) we restrict our analysis to individuals with 1 to 40 years of labour market experience. The three skill categories are grouped into 5 year experience intervals, that is, 1-5, 6-10, 11-15, 16-20, 21-25, 26-30, 31-36, 36-40. Consequently, we end with twenty four education by experience cells in each calendar year.

Our key independent variable is the ratio of immigrants in the labour force to the total labour force. More precisely, the immigrant supply shock in each skill cell is given by:

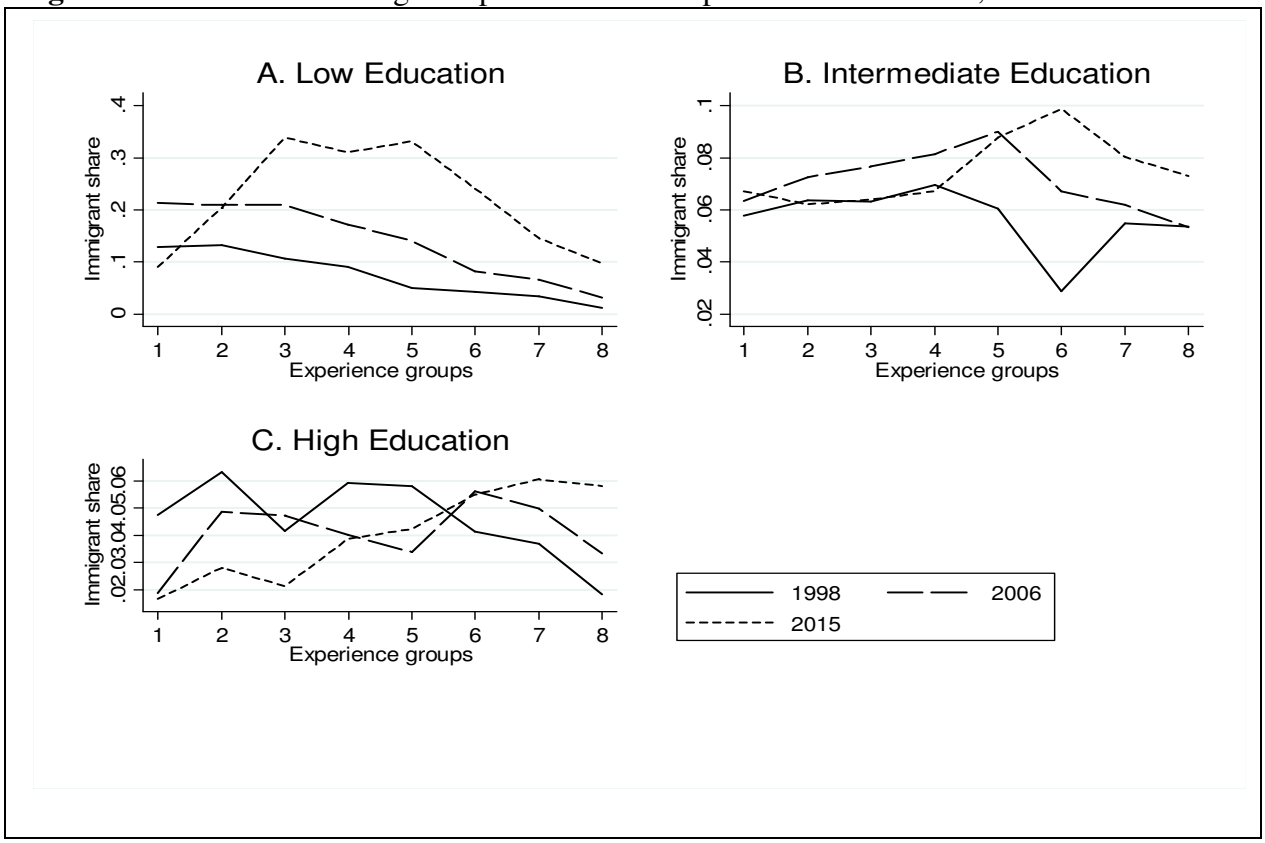
$$p_{ijt} = \frac{M_{ijt}}{N_{ijt} + M_{ijt}}$$

where N_{ijt} and M_{ijt} denote respectively the number of natives and immigrants in the education-experience cell. Figure 5 shows the supply shocks experienced by different skill groups between 1998 and 2015. As can be seen, the group experienced the largest supply shock is that of the less-skilled natives. However, the share of immigrants declines with experience in 1998 and 2006. On the other hand, it follows an inverted U-shaped pattern in 2015.As for the groups of high school

[21] Because it is not possible to account for the workers' actual experience in the labour market, and since potential experience is prone to errors, we check the robustness of our baseline results in section 6 by assigning workers into age instead of experience classes.

and university graduates, the largest immigrant concentrations are generally observed in the middle experience classes.

Figure 5. The Share of Immigrants per Education/Experience Cell in 1998, 2006 and 2015



Notes. The Figure illustrates the supply shocks experienced by the different skill-groups between 1998 and 2015. Experience groups (1, 2, 3,..., 8) are defined in five-year intervals (1-5, 6-10, 11-15, ..., 36-40 years). Low education corresponds to less than primary, primary and lower secondary education. Medium education corresponds to upper secondary and post-secondary non-tertiary education. High education corresponds to bachelor or equivalent, master or equivalent and doctoral or equivalent.

4. The skill-cell approach

To examine the effect of foreign-born workers on the employment opportunities of resident workers we use the national labour market approach introduced by Borjas (2003). To that end, we estimate the following specification[22]:

$$y_{ijt} = \theta p_{ijt} + s_i + x_j + \pi_t + (s_i \times x_j) + (s_i \times \pi_t) + (x_j \times \pi_t) + \varphi_{ijt} \quad (1)$$

[22] Except otherwise specified, we use analytic weights in STATA in order to down-weight cells with small number of observations. The weight is the sample size of the education-experience-period cell.

where y_{ijt} is the value of the mean labour market outcome for Greek workers in cell (i, j, t), namely the mean log monthly wage the unemployment to labour force, the employment to population, and the average hours worked, s_i is a vector of dummies indicating the educational attainment, x_j is a vector of experience dummies, π_t is a vector of time dummies, $(s_i \times x_j)$ stands for the interaction between education and experience fixed effects, $(s_i \times \pi_t)$ is the interaction between education and year fixed effects, and $(x_j \times \pi_t)$ is the interaction between experience and year fixed effects.

This saturated model with the full set of fixed effects and their interactions reduces the risk of spurious correlation due to omitted variables bias and guarantees that the estimated coefficients represent an approximation of the causal impact of immigration[23]. Specifically, the interactions of education and experience with the year dummies control for the possibility that the impact of education and experience is not uniform over time, while the linear fixed effects and the interaction of education by experience accounts for demand shocks specific to each skill class.

5. Preliminary evidence

In this section, we present some basic results regarding the occupational distribution of natives and immigrants, as well as simple scatter plots that convey the main results of the present paper. Following Borjas (2003), Steinhardt (2011) and Ortega and Verdugo (2014), we compute Welch's (1999) index of congruence, which is similar to a correlation coefficient, that is, equals one when there is absolute equal occupational distribution between the two groups, while minus implies the opposite relationship. The index is given by the following relationship:

$$C_{nm} = \frac{\sum_c (q_{nc} - \bar{q}_c)(q_{mc} - \bar{q}_c)/\bar{q}_c}{\sqrt{\sum_c (q_{nc} - \bar{q}_c)^2 \sum_c (q_{mc} - \bar{q}_c)^2/\bar{q}_c}} \quad (2)$$

[23] Ottaviano and Peri (2012) juxtapose that such a demanding model absorbs a very large part of panel variation and results in inflated standard errors.

where q_{hc} is the proportion of group h $(h = n, m)$ employed in occupation c, and $\bar{q}_c$ is the labor-force average.

Table 1 Index of Congruence of Occupational Distributions within Education Group, 1998-2015

Education-experience of native groups:	Experience of immigrants			
	1-10 years	11-20 years	21-30 years	31-40 years
Primary and lower secondary education				
1-10 years	**0.483**	0.438	0.370	0.305
11-20 years	0.436	**0.439**	0.399	0.343
21-30 years	0.315	0.354	**0.372**	0.345
31-40 years	0.250	0.297	**0.331**	0.311
Upper secondary education				
1-10 years	**0.362**	0.046	-0.064	-0.117
11-20 years	**0.015**	-0.155	-0.200	-0.206
21-30 years	-0.199	-0.199	-0.189	**-0.166**
31-40 years	-0.262	-0.268	**-0.240**	-0.207
University graduates				
1-10 years	**0.556**	0.314	0.082	0.056
11-20 years	**0.529**	0.362	0.128	0.096
21-30 years	**0.513**	0.381	0.174	0.141
31-40 years	**0.527**	0.418	0.246	0.197

Note. The table reports the index of congruence across 52 occupations for the 1998-2015 period between natives and immigrants with the same educational background. The index is defined in equation (2). Authors' calculations on GRLFS data.

The results (reported in Table 1) suggest that the less-skilled (lower secondary education or below) and the high-skilled (university graduates) native and foreign-born workers are generally clustered into similar occupations within education and experience cells, although the correlation is significantly lower than the evidence from the United States and France indicates . On the other hand, the evidence indicates that natives and foreigners with high school diploma work in different occupational segments

Before proceeding with our empirical analysis, it is useful to demonstrate the link between our key measures of the labour market performance of natives, namely monthly wages, aggregate employment and unemployment, and the immigrant share within these schooling-experience

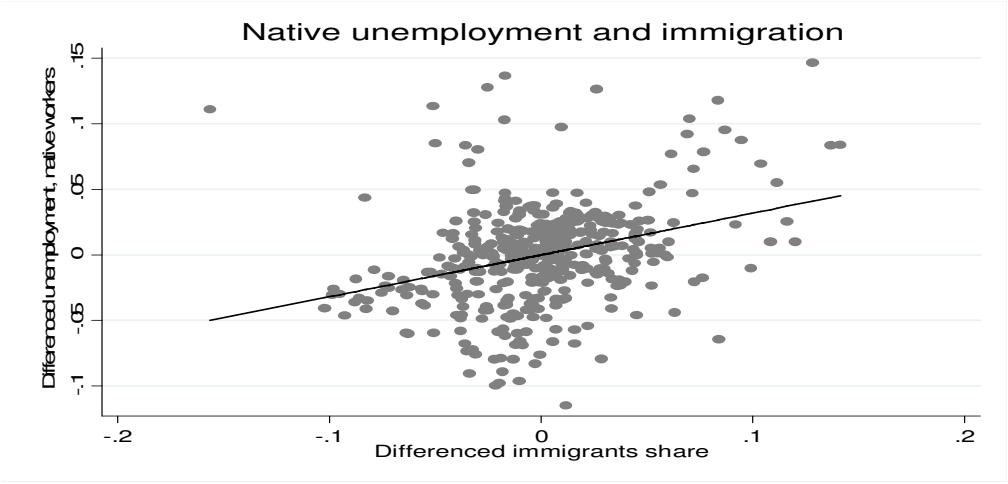
groups. Figure 6, using the data partially reported in Table 2 and Appendix Tables A2, A3 and A4, depicts simple correlations between the aforementioned variables over the period between 1998 and 2015[24]. As can be observed, the scatter diagram documents a strong positive (negative) relation between natives' unemployment (employment, earnings) and immigration. In addition, it is evident that the link between immigration and the labour market outcomes is not driven by outlying observations.

Table 2 Distribution of Immigrants in the Labour Force by Level of Education and Experience, 1998-2015

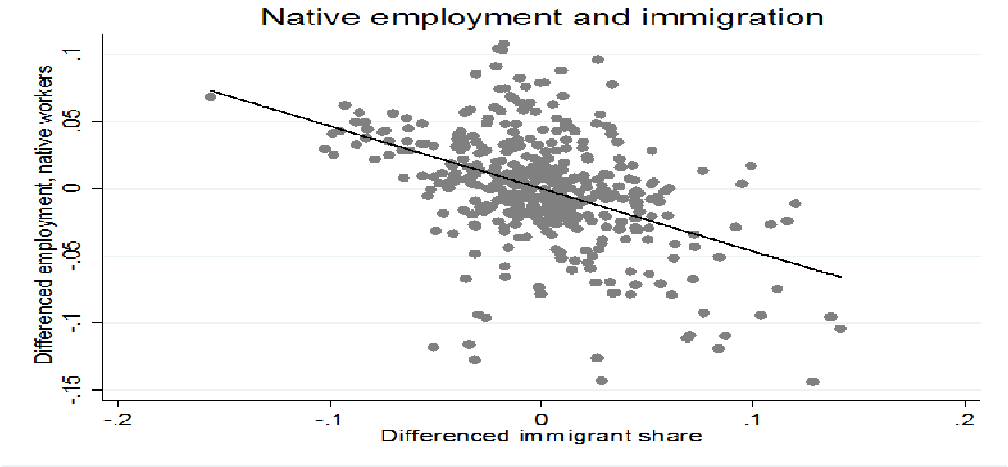
Education	Years of Experience	1998	2002	2006	2010	2015
Lower secondary and below	1-5	0.129	0.203	0.213	0.340	0.091
	6-10	0.132	0.159	0.209	0.391	0.204
	11-15	0.106	0.157	0.209	0.313	0.339
	16-20	0.091	0.132	0.172	0.319	0.310
	21-25	0.050	0.085	0.141	0.268	0.331
	26-30	0.043	0.068	0.082	0.183	0.241
	31-35	0.034	0.048	0.066	0.105	0.145
	36-40	0.012	0.020	0.031	0.071	0.097
High school graduates	1-5	0.058	0.056	0.063	0.115	0.067
	6-10	0.064	0.069	0.073	0.092	0.062
	11-15	0.063	0.083	0.077	0.095	0.064
	16-20	0.070	0.080	0.081	0.130	0.067
	21-25	0.060	0.069	0.090	0.113	0.088
	26-30	0.029	0.059	0.067	0.078	0.099
	31-35	0.055	0.061	0.062	0.094	0.080
	36-40	0.054	0.048	0.053	0.078	0.073
University graduates	1-5	0.048	0.052	0.019	0.034	0.017
	6-10	0.063	0.068	0.049	0.035	0.028
	11-15	0.042	0.052	0.047	0.052	0.021
	16-20	0.059	0.063	0.040	0.052	0.039
	21-25	0.058	0.055	0.034	0.051	0.042
	26-30	0.041	0.073	0.078	0.063	0.055
	31-35	0.061	0.072	0.064	0.073	0.061
	36-40	0.024	0.097	0.059	0.097	0.058

[24] More precisely, Figure 6 plots the residuals from regressing unemployment, employment and average earnings on education, experience and year fixed effects, against the residuals from regressing immigration on education, experience and year fixed effects.

Panel A Slope of the regression line: 0.32, standard error 0.04



Panel B Slope of the regression line: -0.46, standard error 0.04



Panel C Slope of the regression line: -0.39, standard error 0.10

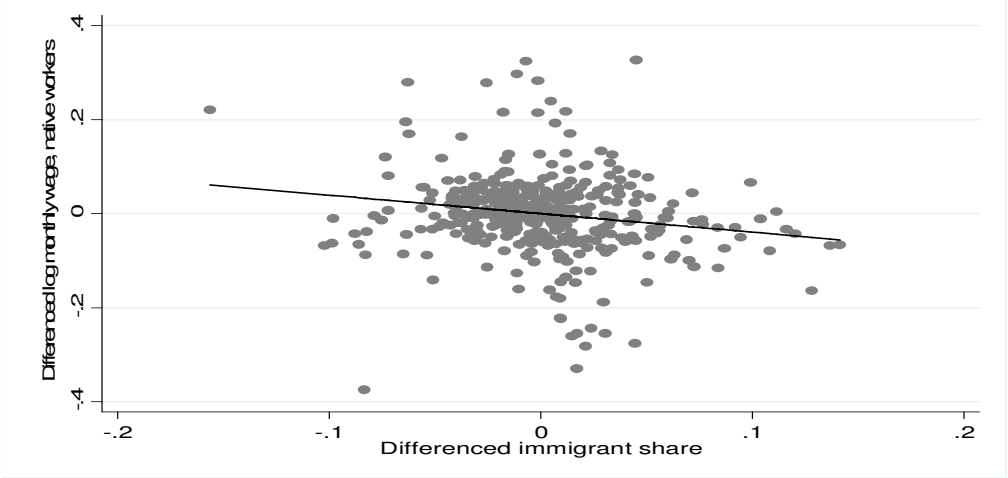


FIGURE 1 Scatter Diagram relating immigration and three measures of the labour market performance of natives

6. Results

Thus far, we have provided some preliminary evidence, that unskilled and skilled immigrants and natives of the same educational attainment have quite similar occupational distribution. On the contrary, high school graduates appear to cluster into different occupations. In this section, we present the main findings of the present paper and several robustness checks of the results. The first set of empirical results are shown in Table 3, where the dependent variable is the mean value of the employment outcomes of natives across education-experience cells, namely unemployment to labour force, employment to population and weekly average hours worked, and the main explanatory variable is the immigrant share. As we discussed in Section 4, we follow Borjas (2003) and include the full set of possible fixed effects in order to control for omitted variables bias, that is, we use education, experience, and period fixed effects, as well as education by year, experience by year and education by experience fixed effects. We also report heteroscedasticity robust standard errors that are clustered within education-experience cells.

The first row of Table 3 indicates that immigration is negatively correlated with the employment and average hours, and positively with the unemployment of male workers. The estimated coefficients imply that a 10% increase in the labour supply due to immigration increases native unemployment by 1.8% and decreases native employment and average hours by 3% and 1.6%[25]. In the second row, we examine whether veteran immigrants (i.e. those with more than 10 years in Greece) are closer substitutes with recent immigrants than natives do. As it is evident, the positive correlation between immigration and the unemployment rate of veteran immigrants is stronger. However, the findings for the employment and average hours do not comport with the hypothesis that labour market competition is heavier among immigrants.

[25] The results are converted into elasticities by multiplying the estimated coefficients by $1/\left(1+m_{ijt}\right)^2$, where $m_{ijt} = M_{ijt}/N_{ijt}$. The mean value of the share of immigrants during the period under consideration is about 8.98%. The elasticities reported in the main text are then given by 0.219×0.84, -0.365×0.84 and -0.196×0.84. See Borjas (2003) for more details.

In rows (3) and (4), we examine whether the impact of immigration is different before and during the Great Recession, started with the collapse of Lehman Brothers in 2008. Indeed, our findings indicate that immigration has a robust adverse effect on the employment outcomes of natives during the economic downturn. On the other hand, immigration appears to have been absorbed by the Greek economy over the course of the economic expansion (1998-2007) without negative effects on natives. Thus, the evidence suggests that the effect of immigration is closely related to the phase of the business cycle.

In the fifth row, we control for the possibility that the immigration share is driven by changes in the native workforce. As can be seen, the results remain quantitatively intact, thereby pointing to the robustness of our baseline specification. The results also appear to be robust even when employing regressions without weights (Row 6). Row (7) uses hours instead of labour market participation as the key exogenous covariate. Again, the results suggest small adverse effects on the employment opportunities of native male workers.

Given that labour market participation may introduce some endogeneity, in Rows (8) and (9) we report evidence from an instrumental variables approach[26]. Specifically, we use the immigrant share one period before and the share in the working age populations, assuming that there is significant correlation with contemporaneous immigrant density but no correlation with the employment outcomes variables. In Row (8), the estimated impact of immigration accounting for potential endogeneity is stronger and highly statistically significant. The results also suggest that measurement error in the key independent variable may also induce downward bias. By contrast, Row (9) returns parameter estimations in the same ballpark as in baseline specification.

Specification (10) accounts for attenuation bias in a different way. Specifically, we merge years in pairs beginning with 1998/1999 and ending with 2014/2015, in order to increase the sample size

[26]Besides addressing potential endogeneity, Two-Stage Least Squares Estimates are also considered to attenuate the consequences of measurement error in the key independent variable (e.g. Dustmann Fabbri and Preston, 2005).

per skill-cell[27]. Evidently, the link between immigration and the employment outcomes variables appears to be stronger than in the baseline specification.

Next, we assume that men and women are relatively good substitutes in the labour market. Markedly, Row (11) yields estimates very similar to those reported without including females. The twelfth specification, reports evidence of imperfect substitutability between female natives and immigrants. In Rows (13) to (16) we check the robustness of our baseline results by: (1) dropping from the sample those cells with less than 300 observations, (2) grouping workers into four, ten year experience bands, (3) using four education groups (primary education, lower secondary, upper secondary and university), (4) classifying workers into two education categories (high school education or below and university) and (5) using age bands instead of experience bands. As can be verified, the unemployment results remain qualitatively identical to those reported in Row (1). On the other hand, the results regarding employment and average hours appear to be somewhat sensitive, Nevertheless the pattern of the coefficients is consistent with the hypothesis of imperfect substitution between immigrants and natives in the short-run.

In Rows (18) and (19), we move beyond average effects and estimate the regression model within schooling and experience groups[28]. The group of natives with ten years of experience and below and that of the less-skilled appear to be more adversely affected by immigration. In contrast, high-school and university graduates gain in terms of employment. Finally, in the fourth row of Specification 18, we eliminate individuals with less than ten and more than thirty years of experience[29]. Although the results are slightly weaker, still there is a short-run deterioration in the employment prospects of natives due to immigration.

[27] Edo (2015) uses a similar strategy for France.
[28] Note, however, that the within education groups estimations must be interpreted with some caution, since they include only experience and year fixed effects.
[29] The idea is to check the robustness of the baseline results by removing workers with low attachment to the labour market, that is, young and near retirement individuals.

Table 3 The Impact of the Immigrant Share on the Labour Market Opportunities of Native Education-Experience Groups

Dependent variable	Unemployment to Labour Force	Employment to Population	Average hours	Obs.
1. Baseline Regression	0.219***	-0.365**	-0.196*	432
	(0.039)	(0.153)	(0.097)	
2. Long term immigrants	0.380***	-0.328*	0.022	432
	(0.131)	(0.175)	(0.155)	
3. 2008-2015 subsample	0.219*	-0.702***	-0.457***	192
	(0.115)	(0.155)	(0.134)	
4. 1998-2007 subsample	0.020	0.082	-0.119**	240
	(0.050)	(0.138)	(0.056)	
5. Includes log native labor force as regressor	0.218***	-0.283***	-0.177**	432
	(0.039)	(0.093)	(0.084)	
6. Unweighted Regression	0.279***	-0.441**	-0.196	432
	(0.062)	(0.210)	(0.117)	
7. Hours instead of labour force.	0.239***	-0.343***	-0.232**	432
	(0.035)	(0.104)	(0.087)	
8. Immigrant share one period before. IV	0.691***	-1.112***	-0.448**	336
	(0.113)	(0.281)	(0.215)	
9. Immigrant share in working age population. IV	0.228***	-0.280**	0.0235	432
	(0.034)	(0.121)	(0.054)	
10. 9 years instead of 18	0.367***	-0.662*	-0.365	216
	(0.103)	(0.349)	(0.219)	
11. Men and women in the dependent variable and p_{ijt}	0.195***	-0.430***	-0.159	432
	(0.053)	(0.136)	(0.096)	
12. Only women in the dependent variable and p_{ijt}	-0.035	-0.178	-0.173	432
	(0.055)	(0.108)	(0.109)	
13. At least 300 observations per skill cell	0.208***	-0.373**	-0.172*	407
	(0.069)	(0.146)	(0.086)	
14. Four experience groups	0.209***	-0.111	-0.059	216
	(0.059)	(0.165)	(0.074)	
15. Four education groups	0.113***	-0.172**	-0.001	576
	(0.034)	(0.073)	(0.099)	
16. Two education groups	0.254***	-0.310	-0.210	288
	(0.035)	(0.181)	(0.126)	
17. Age instead of experience bands	0.120***	-0.130	-0.027	432
	(0.029)	(0.078)	(0.064)	
18. Heterogeneous effects by experience				
- experience [1-10]	0.271***	-0.803*	-0.026	108
	(0.061)	(0.324)	(0.054)	
- experience [11-20]	-0.018	-0.202	-0.207**	108
	(0.122)	(0.177)	(0.052)	
- experience [21-30]	0.240*	-0.263*	-0.185	108
	(0.107)	(0.119)	(0.106)	
- experience [31-40]	-0.118	-0.733*	0.027	108
	(0.077)	(0.355)	(0.178)	

(*Continued*)

Table 2 Continued

- experience [11-30]	0.192**	-0.182*	-0.049	216
	(0.066)	(0.091)	(0.0.72)	
19. Heterogeneous effects by education				
- low education	0.220***	-0.413***	-0.239**	144
	(0.054)	(0.069)	(0.096)	
- secondary education	-0.676*	0.231	0.169	144
	(0.294)	(0.539)	(0.099)	
- university education	-0.519**	0.353	0.024	144
	(0.204)	(0.308)	(0.082)	

Notes. Sample I: GRLFS data. The table reports the coefficient of the immigrant share variable from regressions where the dependent variable is the mean labor market outcome for a native education-experience group for the 1998-2015 period. Each cell contains estimates from a separate regression. Standard errors are reported in the parentheses below the estimated coefficients, and are adjusted for clustering within education-experience cells. All regressions, except for those reported in row 6, are weighted by the sample size of the education-experience-period cell. All regressions, except for those reported in row 15, include education, experience, and period fixed effects, as well as interactions between education and experience fixed effects, education and period fixed effects, and experience and period fixed effects. Regressions in row 18 include experience and year fixed effects.
***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

In Table 4, we report similar estimates[30], using Census data for years 1991 and 2001. As can be observed, immigration bears a positive and significant coefficient when the dependent variable is native male unemployment. Remarkably, and contrary to the results shown in Table 3, there is also a positive correlation between immigrant share and female unemployment. As for employment, we do not find statistically significant effects of immigration. In the last row, we estimate the impact of migrants on average hours worked. Again, our key independent variable enters with a negative and significant coefficient when the case of male workers is considered. In all other instances, immigration appears with a negative coefficient, but it is no more significant at the standard significant levels.

[30] In particular, we present results where the labour market is sliced into three education and ten age bands. We prefer this classification with Census data, given that it allows us to increase (slightly) the number of observations. Nevertheless, results (not reported) obtained via the usual education and experience bands are remarkably very similar to those in Table 3.

Table 4 Impact of Immigrant Share on the Employment Outcomes of Native Education-Age Groups

	Men	Women	Pooled Men and Women
Unemployment to labour force	0.275**	0.681***	0.408***
	(0.106)	(0.232)	(0.124)
Employment to population	-0.047	-0.148	-0.097
	(0.159)	(0.360)	(0.756)
Average hours worked	-0.182**	-0.072	-0.117
	(0.081)	(0.142)	(0.368)

Sample II: Census data 1991 and 2001. The table reports the coefficient of the immigrant share variable from regressions where the dependent variable is the mean labor market outcome for a native education-age group. Standard errors are reported in parentheses and are adjusted for clustering within education and age cells, All regressions are weighted by the sample size of the education-age-period cell. The regressions reported in the columns (1-2) have 60 observations. The regressions reported in the third column have 120 observations. All regressions include education, age, and period fixed effects, as well as interactions between education and age fixed effects, education and period fixed effects, and age and period fixed effects.

***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

In Table 5 we regress the mean log monthly earnings of natives on immigration and the usual set of fixed effects, namely, education, experience, year, education by year, experience by year and education by experience fixed effects. We report WLS and OLS estimates of equation (1) for the entire period by gender, as well as separate estimates for the period before since the onset of the Great Recession[31]. In Columns (1-3), we report results for all workers, weighted for hours worked, while in Columns (4-6) we exclude workers with low attachment to the labour market, that is, workers with less than 35 weekly hours worked[32]. The idea is that if native workers with low attachment to the labour market respond to immigration by moving out of employment, the average native wage will increase, resulting in an upward bias in estimates of the direct effect of immigration on wages (e.g. Bratsberg and Raaum, 2012).

[31] Results using data from the Survey of Income and Living Conditions (SILC), are remarkably similar to those shown in Table 3 and are available upon request from the authors

[32] In their empirical analysis, Borjas, Grogger and Hanson (2008), Ottaviano and Peri (2012) and Bratsberg, Raaum, Røed and Schøne (2014) also report separate estimates from samples including and excluding part-time workers.

Table 5 The Impact of the Immigrant Share on the Log Monthly Earnings of Native Education-Experience Groups

Specification	(1) WLS	(2) Unweighted	(3) Before GR	(4) During GR	(5) WLS	(6) Unweighted	(7) Before GR	(8) During GR
	All workers, weighted by hours				Full time workers only			
Panel A. Average effects								
Men	0.029	-0.296**	0.353**	-0.264*	0.043	-0.163**	0.276	-0.254*
	(0.072)	(0.107)	(0.153)	(0.135)	(0.057)	(0.061)	(0.169)	(0.126)
Women	0.099	0.216	0.097	-0.267	-0.118	0.041	0.243	-0.398
	(0.233)	(0.181)	(0.112)	(0.208)	(0.188)	(0.094)	(0.176)	(0.366)
Pooled Men and Women	0.100	-0.090	0.247*	-0.292*	0.102*	-0.016	0.200	-0.195
	(0.071)	(0.079)	(0.125)	(0.126)	(0.056)	(0.035)	(0.053)	(0.157)
Panel B. Heterogeneous effects by education group								
Men, Lower Secondary or below	0.001	-0.362***	0.280	-0.350**	0.017	-0.209***	0.232	-0.327**
	(0.064)	(0.104)	(0.207)	(0.152)	(0.055)	(0.053)	(0.230)	(0.144)
Men, High School Graduates	-0.055	0.076	-0.108	-0.053	-0.100	0.026	-0.219	-0.107
	(0.237)	(0.359)	(0.331)	(0.229)	(0.218)	(0.315)	(0.351)	(0.281)
Men, University Graduates	0.305	0.160	1.204***	0.148	0.402	0.211	1.119***	0.210
	(0.279)	(0.334)	(0.256)	(0.525)	(0.257)	(0.280)	(0.315)	(0.577)
Panel C. Heterogeneous effects by experience group								
Men 1-10 years of experience	0.206	-0.174	0.492	-0.288**	0.294**	0.228*	0.249	0.026
	(0.185)	(0.110)	(0.352)	(0.107)	(0.095)	(0.091)	(0.342)	(0.359)
Men 11-20 years of experience	0.249	0.348*	0.081	0.416	0.268	0.281	0.088	0.410
	(0.324)	(0.173)	(0.426)	(0.271)	(0.320)	(0.204)	(0.446)	(0.369)

(Continued)

Table 3 Continued

Men 21-30 years of experience	0.251	0.112	0.461	-0.656*	0.139	0.006	0.227	-0.674**
	(0.206)	(0.160)	(0.410)	(0.291)	(0.148)	(0.122)	(0.387)	(0.260)
Men 31-40 years of experience	0.732***	0.828***	1.302***	0.559*	0.777***	0.850***	1.398***	0.593*
	(0.161)	(0.128)	(0.147)	(0.241)	(0.146)	(0.141)	(0.174)	(0.257)

Notes. Sample I: GRLFS data. The table reports the coefficient of the immigrant share variable from regressions where the dependent variable is the log of monthly earnings for a native education-experience group for the 1999-2015 period. Standard errors are reported in the parentheses below the estimated coefficients, and are adjusted for clustering within education-experience cells. All regressions, except for those reported in rows 2 and 5, are weighted by the sample size of the education-experience-period cell. Except for specifications in Panel B, all regressions include education, experience, and period fixed effects, as well as interactions between education and experience fixed effects, education and period fixed effects, and experience and period fixed effects. The regressions reported in Panel B include experience and period fixed effects.

***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

Usually, we find that there are no significant discrepancies between the all workers and full-time workers samples, a result implying that our estimates are not immune to upward bias. WLS estimates indicate that the impact of immigration clusters around zero in male equations. Remarkably, regressions without weights indicate negative and significant effects on native wages, a result arguably driven by those cells with small number of observations. For instance, the implied elasticity for full-time workers is about -0.14, indicating that a 10% increase in labour supply due to immigration decreases the average wage of male workers by 1.4%. Yet, when we split our sample in two subsamples (1999-2007 and 2008-2015), we find that immigrants exert a positive significant influence on male earnings before the Great Recession, while a robust negative relationship is ascertained during the Great Recession[33].

As for women, we fail to establish a significant link with immigration, even during the Great Recession. For this particular period, however, the estimated coefficients become more negative. When we pool men and women, we find a positive and significant coefficient for the sample of full time workers. Again, there is evidence that the impact of immigration differs with the stage of the business cycle. That is, migrants complement natives during the phase of economic expansion, and exert a harmful effect during the phase of the current recession.

In Panel B, we estimate the wage equations separately for each education group. The first row shows a negative significant effect on the wages of less-skilled natives during the Great Recession. On the other hand, the impact of immigration on the earnings of high-school graduates turns out to be statistically insignificant in all specifications. Interestingly, university graduates appear to gain from immigration in terms of wages during the 1999-2007 period.

Panel C reports estimates by experience groups. With the exception of the positive and significant relationship between the earnings of men with 31-40 years of working experience and

[33] The fact that Greece has been in deep recession since 2008 can be a confounding factor for the negative effects. Yet, when we introduce stronger controls (i.e. the unemployment rate per skill-cell), the results remain unaffected (we thank Giovanni Peri for bringing this fact in our attention).

immigration, we usually do not find significant results. There is, however, some evidence consistent with idea that immigration is harmful for the less-experienced native males and those with 21-30 years of working experience during the Great Recession.

As a final exercise, we re-estimate the model using two alternative immigration measures, namely recent immigrants (with 10 or less years of residence in Greece) and veteran immigrants (with more than 10 years of residence in Greece)[34]. The rationale behind implementing such a strategy is to obtain a better understanding of whether the substitutability between natives and immigrants varies with the assimilation process of immigrants. If immigrants lack country-specific human capital (i.e. migrants are not perfect substitutes with natives upon arrival), their short-run impact is expected to be negligible. However, as migrants accumulate human capital, they could compete more heavily with natives in the long-run. On the contrary, if immigrants happen to be perfect substitutes with natives upon their arrival in the host country, then one would expect large adverse effects in the short-run. Yet, as discussed in Section 3, there are many reasons to expect that in the long-run, the economy has the capacity to mitigate the initial negative influence of immigration on the employment opportunities of natives.

The results reported in Table 5 indicate that recent immigrants compete more heavily with natives than veteran immigrants do. More precisely, with the notable exception of male unemployment, the coefficient of veteran immigrants becomes lower in magnitude and usually insignificant, when the impact of immigration on the employment outcomes of natives is considered. Interestingly, there is evidence that in the long-run, migration exerts a positive (significant) influence on male earnings. As for females, the results again point in favour of imperfect substitutability, either in the short-run or in the long-run. When pooling men and women,

[34] A similar approach has been previously used by Cohen-Goldner and Paserman (2006 and 2011), who report evidence that native wages are negatively correlated only with the fraction of immigrants with little experience in the Israeli labour market. On the other hand, Carrasco, Jimenez and Ortega (2008) find that the impact of immigration becomes more adverse as time of residence in Spain goes by.

the results are again consistent with the idea that the host economy can absorb immigration by creating new job opportunities.

Table 5 The Impact of the Immigrant Share by Years of residence in Greece on the Labour Market Opportunities of Native Education-Experience Groups

	Recent Immigrants	Veteran Immigrants
Panel A: Men		
Log Monthly wages	-0.148	0.143*
	(0.130)	(0.072)
Unemployment to labour force	0.195***	0.142***
	(0.061)	(0.037)
Employment to population	-0.484**	-0.014
	(0.225)	(0.174)
Average hours worked	-0.351*	0.037
	(0.178)	(0.075)
Panel B: Women		
Log Monthly wages	-0.225	-0.066
	(0.291)	(0.096)
Unemployment to labour force	-0.031	-0.013
	(0.096)	(0.081)
Employment to population	-0.067	-0.101
	(0.178)	(0.111)
Average hours worked	-0.146	-0.089
	(0.104)	(0.081)
Panel C: Pooled Men and Women		
Log Monthly wages	-0.049	0.127*
	(0.124)	(0.072)
Unemployment to labour force	0.236*	0.054
	(0.132)	(0.049)
Employment to population	-0.513***	-0.078
	(0.175)	(0.117)
Average hours worked	-0.310**	0.015
	(0.129)	(0.091)

Notes. Sample I: GRLFS data. The table reports the coefficient of the immigrant share variable from regressions where the dependent variable is the mean labor market outcome for a native education-experience group for the 2008-2015 period. Each cell contains estimates from a separate regression. Standard errors are reported in the parentheses below the estimated coefficients, and are adjusted for clustering within education-experience cells. All regressions are weighted by the sample size of the education-experience-period cell. All regressions include education, experience, and period fixed effects, as well as interactions between education and experience fixed effects, education and period fixed effects, and experience and period fixed effects. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

7. Accounting for effective experience

Thus far, we have assumed perfect transferability of human capital between Greece and the sending countries, that is, natives and immigrants pre-immigration experience is equally valued in the Greek labour market. However, given that immigrants upon arrival lack country-specific human capital (i.e. knowledge of language, host-country norms, nature of the labour market) (Chiswick, 1978) an instructive exercise involves calculating "effective experience" before assigning them into education-experience cells and then compare the results to those obtained using the actual experience. Hence, following Borjas (2003)[35], we assume that effective years of experience for immigrant workers are given by:

$$X = \begin{cases} \alpha(A_m - A_T) + \beta(A - A_m), & if\ A_m > A_T \\ \gamma(A - A_T) & if\ A_m \leq A_T \end{cases}$$

where A_m denotes the age of entry in Greece and A_T the age of entry into the labour market. Parameters α and β translate experience acquired abroad and in Greece respectively by immigrants who migrated as adults (i.e. $A_m > A_T$), into equivalent value of experience acquired by natives. Likewise, γ rescales experience of immigrants who migrated as children (i.e. $A_m \leq A_T$).

Next, we estimate the following generic assimilation regressions for immigrants who entered Greece as adults and children respectively[36]:

$$logw = s_i + \phi_1^A Experfor + \phi_2^A Expergr + \delta Y + \rho\pi + \phi \quad if\ A_m > A_T \tag{3}$$

$$logw = s_i + \phi_1^C Expergr + \delta Y + \rho\pi + \phi \quad if\ A_m \leq A_T \tag{4}$$

where s_i denotes education fixed effects, Y are cohort of immigration dummies and π are year fixed effects. As for native workers, we estimate the following standard Mincerian specification:

$$logw = s_i + \phi_1^N Expergr + \rho\pi + \phi \tag{5}$$

Effective experience is then calculated using the following weights.

[35] See also Cohen-Goldner and Paserman (2011). On the other hand, Bratsberg, Raaum, Røed and Schøne (2014) account for effective experience by simply ignoring any pre-arrival experience for Norway.

[36] Because in the GRLFS years since immigration is set 11 for immigrants with more than 10 years of residence in Greece for the 2002-2007 period, we cannot distinguish between adult and child immigrants for that period. Hence, the analysis is restricted to data drawn from 2008 to 2015 cross-sections.

$$\alpha = \frac{\phi_1^A}{\phi_1^N}\,,\ \beta = \frac{\phi_2^A}{\phi_1^N},\ \gamma = \frac{\phi_1^C}{\phi_1^N}. \tag{6}$$

Table 6. The impact of different types of experience on the long monthly earnings of natives and immigrants

	Group		
Coefficient of:	Natives	Child Immigrants	Adult Immigrants
Source country experience	−	−	-0.002
			(0.002)
Source country experience squared ÷ 10	−	−	0.001
			(0.001)
Greek experience	0.026***	0.029***	0.022***
	(0.000)	(0.004)	(0.006)
Greek experience squared ÷ 10	-0.003***	-0.005***	-0.003
	(0.000)	(0.001)	(0.002)
Mean value of:			
Source country experience	−	−	9.7
Greek experience	21.5	12.9	11.7
Marginal value of an additional year of experience for immigrants:			
Source country experience	−		0.0006
Greek experience	−	0.017	0.015
Marginal value of an additional year of experience for natives, evaluated at mean value of relevant sample of immigrants	−	0.018	0.013
Year dummies	Yes	Yes	Yes
Year of arrival dummies	No	Yes	Yes
Observations	39,177	1,564	4,525

Notes. Robust standard errors are shown in parentheses below the estimated coefficients. The regressions pool data for the 2008-2015 period. The regressions of immigrants include dummy variables indicating the year in which the immigrant arrived (1958-1962, 1963-1967, 1968-1972, 1973-1977, 1978-1982, 1983-1987, 1988-1992, 1993-1997, 1998-2002, 2003-2007, 2008-2012, 2013-2015).***, **,* indicate significant at 1%,5%,10% significant levels

Table 6 reports the relevant coefficients from the above equations[37]. As can be seen, the experience of natives and child immigrants is almost equally valued by Greek employers. This implies that the weight γ is estimated to be 1. Similarly, the implied weight β is also 1. On the contrary, given that the payoff to pre-immigration labour market experience is insignificant and close to zero, the implied weight α is 0. Consequently, we eliminate pre-immigration experience for adult immigrants and assign them into skill-cells accordingly. Since the mean value of source country experience is about 9.7 years, the adjustment for effective experience reallocates adult immigrants into lower experience cells and the supply shock in these cells becomes heavier than it is when actual experience is considered.

Table 7 The Impact of the Immigrant Share Adjusted for Effective Experience

	Dependent Variable			
	Log Monthly Earnings	Unemployment to labour Force	Employment to Population	Average Hours Worked
Immigration Share	-0.254*	0.226**	-0.443***	-0.274*
	(0.116)	(0.082)	(0.154)	(0.154)

Notes. . Sample I: GRLFS data. The table reports the coefficient of the immigrant share variable from regressions where the dependent variable is the mean labor market outcome for a native education-experience group for the 2008-2015 period. Each cell contains estimates from a separate regression. Standard errors are reported in the parentheses below the estimated coefficients, and are adjusted for clustering within education-experience cells. All regressions are weighted by the sample size of the education-experience-period cell. All regressions include education, experience, and period fixed effects, as well as interactions between education and experience fixed effects, education and period fixed effects, and experience and period fixed effects. ***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

In Table 7, we present immigrant share coefficients, after having adjusted the sample for the effective experience of adult immigrants. Given that the estimates for effective experience cover the 2008-2015 period, the comparison with the estimates from the actual experience involves the entries in the third Row of Table 3 and the eighth Column of Table 4. As can be observed, the sign

[37] We have also checked the robustness of the experience coefficients using interval regressions. The results are qualitative similar to those reported in Table 4 and are available upon request.

and the significance of the immigrant share remain unchanged. However, the effect appears to be weaker when immigrants are assigned into skill-cells after having eliminated any pre-immigration work experience.

8. A Comparison with the Spatial Correlations

In Table 8[38], we collapse our data into region-education-experience-year cells and re-estimate the impact of immigration on the usual labour market outcomes of natives. As discussed in Section 3, should migrants settle in regions with booming economic conditions, spatial correlations yield biased towards zero results. Hence, it seems interesting to compare the results from the spatial correlations with those previously obtained from the national approach (Table 3 and 4).

Following Borjas (2003), each Column reports results based on different sets of fixed effects. Specifically, the first Column includes region, education, experience, and year fixed effects, as well as region by year, education by year, experience by year and education by experience fixed effects. The second Column adds a three-way interaction between region, education and experience fixed effects, while the third Column adds education by experience by year fixed effects. Finally, Column (4) includes region by education by year and region by experience by year fixed effects. We also report two set of heteroscedasticity robust standard errors. The first set is adjusted for clustering within region-education-experience cells, and the second within region-year cells.

As can be verified, when spatial units enter into the analysis, the effect of immigration on the employment opportunities of natives, usually appears to be insignificant. Of course, this finding is probably driven by simultaneity bias, that is, immigrants settle in areas where the labour markets are strong, thereby resulting in downward bias in the estimates of the direct effect of immigration. There is, however, some evidence in Column (1), that immigration exerts adverse influence on the employment outcomes of natives.

[38] The results reported in Table 7 are obtained using the command reghdfe in STATA.

Table 8. The Impact of the Immigrant Share on the Labour Market Opportunities of Native Region-Education-Experience Groups

Dependent Variable	(1)	(2)	(3)	(4)
1. Monthly wage	-0.003	-0.023	-0.039	0.037
	[0.027]	[0.036]	[0.038]	[0.048]
	[0.025]	[0.032]	[0.036]	[0.043]
2. Unemployment to labour force	0.154	0.035	0.006	-0.009
	[0.025]***	[0.022]	[0.023]	[0.035]
	[0.016]***	[0.020]*	[0.022]	[0.029]
3. Employment to population	-0.302	-0.075	-0.022	-0.012
	[0.186]	[0.027]***	[0.026]	[0.040]
	[0.043]***	[0.030]**	[0.029]	[0.036]
4. Average hours	0.010	0.031	0.010	0.020
	[0.064]	[0.025]	[0.027]	[0.037]
	[0.037]	[0.033]	[0.028]	[0.039]
Controls:				
(Region by year), (education by year), (experience by year), (region by education) fixed effects	Yes	Yes	Yes	Yes
(Region by education by experience) fixed effects	No	Yes	Yes	Yes
(Education by experience by year) fixed effects	No	No	Yes	Yes
(Region by education by year), (region by experience by year) fixed effects	No	No	No	Yes

Notes. The table reports the coefficient of the immigrant share variable from regressions where the dependent variable is the mean labor market outcome for a native region-education-experience group for the 1998-2015 period. Two sets of heteroscedasticity robust standard errors are reported in brackets below the estimated coefficients. The first is adjusted for clustering within region-education-experience cells and the second within region-year cells. The regression on monthly wage has 5234 observations; the regression on unemployment to labour force have 5580 observations; the regression on employment to population has 5595 observations; the regressions on average hours have 5555 observations.

9. The impact of immigration on the task performance of natives

Up to this point, we have analyzed the relationship between immigration and the labour market opportunities of natives. In this section, we build on previous literature[39] that examines the

[39] See Autor, Levy and Murnane (2003) and Goos, Manning and Salomons (2009) for applications outside the immigration context.

immigration-task specialization of natives nexus (see e.g. Peri and Sparber, 2009; Amuedo-Dorantes and de la Rica, 2011; D'Amuri and Peri, 2014; Ortega and Verdugo, 2014), seeking to provide new insight on whether and how immigration affects the task performance of native workers. As discussed in Section 3, these studies document that natives protect themselves from foreign-born competitors via a positive reallocation towards more complex tasks, complementary to manual tasks, usually performed by immigrants.

There are, however, many reasons to believe, that, as far as the case of Greece is concerned, the occupational upgrading of natives is a priori ambiguous. As emphasized by Peri (2014), the mechanism of positive reallocation is weaker in some of the Southern European countries with inflexible labour markets and protective institutions. In order to capture the complex picture of how immigration affects the task specialization of natives, we combine GRLFS data with data on task measures across occupations, namely routine task intensity, abstract, routine and service task importances, calculated by Goos, Manning and Salomons (2010)[40]. In Table 8 we regress the aforementioned task measures on the immigrant share and the usual set of education, experience and year fixed effects. Following Peri and Sparber (2009) and Amuedo-Dorantes and de la Rica (2011) we focus on recent immigrants, i.e. those with less than 10 years of residence in Greece. Nevertheless, we also report results considering the impact of the entire pool of immigrants. In addition, we examine whether the effect, if any, differs with the phase of business cycle.

Unlike previous studies, the evidence reported in Table 9, albeit not very much precise, indicates that immigration is positively associated with routine task intensity when the group of males is considered (Panel A). Given that routine task intensity is defined as the ratio of routine task importance to the sum of abstract and service task importances, the positive effect is mainly driven by the positive significant impact of immigration on the nominator variable and the negative

[40] The task measures are calculated at the O*NET occupational level, and then are converted into ISCO level. The relative values are reported in Table 4, p.49.

significant impact on the second denominator variable. Remarkably, the correlation between immigration and the task measures appears to be stronger during the 2008-2015 period.

Table 9. The Impact of the Immigrant Share on the Supply of Tasks of Native Workers

	All immigrants	Recent immigrants	1998-2007 subsample	2008-2015 subsample
Panel A. Men				
Abstract task importance	0.473 (0.307)	0.621 (0.421)	-0.309 (0.402)	1.109** (0.448)
Routine task importance	0.956* (0.550)	1.622* (0.899)	0.751* (0.427)	2.484*** (0.761)
Service task importance	-0.407 (0.279)	-0.838* (0.487)	-0.591 (0.382)	-1.056** (0.439)
Routine task intensity	0.648 (0.409)	1.189* (0.693)	0.669 (0.399)	1.770*** (0.619)
Panel B. Women				
Abstract task importance	0.217 (0.368)	0.165 (0.338)	-0.112 (0.452)	-0.399* (0.198)
Routine task importance	0.578 (0.396)	0.542 (0.533)	0.387 (0.328)	-0.139 (0.828)
Service task importance	-0.166 (0.276)	-0.223 (0.349)	-0.095 (0.448)	-0.281 (0.930)
Routine task intensity	0.412 (0.257)	0.406 (0.379)	0.297 (0.341)	0.029 (0.761)
Panel C. Pooled Men and Women				
Abstract task importance	0.368 (0.250)	0.386 (0.320)	-0.279 (0.376)	0.611 (0.448)
Routine task importance	0.838* (0.412)	1.270* (0.706)	1.061* (0.535)	1.553* (0.834)
Service task importance	-0.419 (0.327)	-0.707 (0.454)	-0.745 (0.462)	-0.726 (0.515)
Routine task intensity	0.597* (0.346)	0.992* (0.566)	0.885* (0.475)	1.162* (0.665)

Notes. The table reports the correlation of the immigrant share with four measures of natives' task performance for the 1998-2015 period. Each cell contains estimates from a separate regression. Standard errors are reported in the parentheses below the estimated coefficients, and are adjusted for clustering within education-experience cells. All regressions include education, experience, and period fixed effects, as well as interactions between education and experience fixed effects, education and period fixed effects, and experience and period fixed effects.
***, **, and * denote statistical significance at the 1, 5, and 10% level, respectively.

For females (Panel B), the inflated standard errors do not facilitate the inference, since the results appear to be insignificant at standard significant levels. The estimated coefficients appear to be much smaller than those reported for males, but the pattern remains unchanged. In Panel C, we pool Men and Women. The findings again confirm that higher immigrant concentrations are associated with stronger routine task intensity and routine task importance.

Summarizing the evidence shown in Table 9, immigration causes a negative reallocation of natives towards non-complex, routine tasks. All in all, these results provide empirical support for the idea that in Greece, complex, formal sector jobs are usually not available for the outsiders, in light of the level of entry barriers legally imposed by insiders.

10. Summary and Conclusions

Recent developments in the empirical literature of immigration have challenged the notion from the earlier spatial correlations studies that the effects of immigration are clustered around zero. Subsequent national, skill-cell studies (e.g. Borjas, 2003 and 2009, Ottaviano and Peri, 2012, and Manacorda, Manning and Wadsworth, 2012), have reported conflicting results. Along those lines, this study explores, for the first time, the labour market consequences of immigration in Greece. We show that the presence of immigrants, especially in the short-run, negatively affects the employment outcomes of Greek workers. On average, the estimated elasticities imply that a 10% increase in the share of immigrants, decreases employment by 3% and increases unemployment by 1.8%. The group that appears to bear the cost of immigration is that of the less-skilled natives. These results are consistent with those of Borjas (2003, 2014).

On the other hand, native earnings appear less sensitive to immigration. That said, given the institutional setting in Greece, it is not surprising that immigration is negatively associated with the employment opportunities of natives in the short-run, but does not depress the earnings of natives. Remarkably, we find that the impact of immigration differs with the stage of the business cycle. In

particular, there is some evidence of complementarity before the Great recession. Yet, adverse effects are ascertained during the Great Recession.

Of course this study has some limitations which have to be pointed out. First, as it is well-known, the estimated impact of immigration could be attenuated by potential sampling error of the key explanatory variable (e.g. Aydemir and Borjas, 2011), although such errors tend to be low in the LFS (see e.g. Eurostat 2013). Second, when we aggregate wages, the average size across cells is 912 observations. By contrast, in the employment equations, the average size across skill-cells is 1580 observations. Hence we are more confident about the robustness of the employment effects of immigration. The wage equations also reflect stark discrepancies between weighted and unweighted specifications. Consequently, we prefer specifications where the sample size of the education-experience-period cell is used as weight. This enables us to down-weight cells with small number of observations.

What is more, the focus is on the short-run, where the capacity of the economy to absorb the supply shock without detrimental effects on the competing natives is very limited. Incorporating in the analysis the mechanism by which immigration restores the capital/labour ratio to its steady-state level or other job creation mechanisms, that is, analyze the impact of immigration using a general equilibrium framework, should possibly contribute to a better understanding of the big picture. Noteworthy, our preliminary evidence is consistent with the idea that the impact of immigration becomes milder in the long-run. All in all, the substantial partial effects on natives labour market outcomes reported in this paper, mainly driven by the adverse effects of immigration ascertained during the Great Recession, highlight the need for considering changes in the structure of the labour and product market, rather than following the Malthusian rationale in migration policy-making. Implementing structural reforms that will enable the country to break the vicious cycle of recession, and enter a virtuous cycle of growth, would make again possible for the economy to accommodate immigration without significant effects (as our results for the pre-crisis period imply).

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Appendix

Table A 1 Bilateral Correlations between the key variables used in the paper

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Immigrant share	1.00								
2. Unemployment	0.47	1.00							
3. Employment	-0.36	-0.66	1.00						
4. Average hours worked	0.23	0.03	0.23	1.00					
5. Log monthly earnings	-0.59	-0.86	0.54	-0.27	1.00				
6. Abstract task importance	-0.57	-0.57	0.32	-0.68	0.79	1.00			
7. Routine task importance	0.61	0.35	-0.18	0.70	-0.64	-0.90	1.00		
8. Routine task intensity	0.60	0.36	-0.19	0.71	-0.66	-0.92	1.00	1.00	
9. Service task importance	-0.53	-0.25	0.10	-0.70	0.57	0.85	-0.96	-0.97	1.00
10. Experience [6-10]	0.10	0.22	-0.02	-0.04	-0.27	-0.08	0.03	0.04	-0.05
11. Experience [11-15]	0.11	0.02	0.16	0.06	-0.09	-0.04	0.02	0.02	0.00
12. Experience [16-20].	0.12	-0.07	0.21	0.07	0.02	-0.01	0.01	0.01	0.01
13. Experience [21-25]	0.03	-0.13	0.23	0.09	0.10	0.02	0.00	0.00	-0.01
14. Experience [26-30]	-0.07	-0.17	0.21	0.08	0.18	0.05	0.01	0.00	0.00
15. Experience [30-35]	-0.16	-0.17	0.10	-0.02	0.23	0.09	-0.02	-0.03	0.01
16. Experience [36-40]	-0.20	-0.18	-0.20	0.07	0.24	0.12	-0.05	-0.06	0.06
17 Medium Education	-0.23	0.02	0.00	0.33	-0.11	-0.31	0.09	0.13	-0.12
18. High Education	-0.48	-0.31	0.20	-0.78	0.57	0.90	-0.86	-0.88	0.84

Table A2 Unemployment Rate of Natives by Skill Cell, 1998-2015

Education	Years of Experience	1998	2002	2006	2010	2015
Lower secondary and below	1-5	0.20	0.16	0.22	0.33	0.50
	6-10	0.17	0.15	0.15	0.28	0.49
	11-15	0.09	0.11	0.10	0.17	0.39
	16-20	0.06	0.07	0.06	0.13	0.31
	21-25	0.05	0.05	0.06	0.11	0.32
	26-30	0.05	0.03	0.04	0.08	0.22
	31-35	0.04	0.04	0.03	0.08	0.21
	36-40	0.05	0.04	0.04	0.08	0.19
High school graduates	1-5	0.23	0.23	0.18	0.25	0.51
	6-10	0.11	0.11	0.09	0.14	0.32
	11-15	0.06	0.06	0.05	0.10	0.21
	16-20	0.05	0.06	0.04	0.07	0.16
	21-25	0.04	0.03	0.03	0.05	0.18
	26-30	0.03	0.02	0.02	0.06	0.12
	31-35	0.05	0.04	0.03	0.07	0.17
	36-40	0.03	0.03	0.02	0.05	0.18
University graduates	1-5	0.14	0.15	0.13	0.21	0.34
	6-10	0.05	0.06	0.07	0.09	0.19
	11-15	0.02	0.03	0.03	0.05	0.13
	16-20	0.01	0.01	0.02	0.02	0.11
	21-25	0.01	0.01	0.02	0.02	0.07
	26-30	0.01	0.01	0.01	0.01	0.08
	31-35	0.01	0.02	0.01	0.01	0.07
	36-40	0.00	0.00	0.00	0.03	0.06

Table A3 Employment Rate of Natives by Skill Cell, 1998-2015

Education	Years of Experience	1998	2002	2006	2010	2015
Lower secondary and below	1-5	0.13	0.10	0.08	0.04	0.02
	6-10	0.75	0.74	0.74	0.64	0.43
	11-15	0.87	0.84	0.86	0.79	0.55
	16-20	0.89	0.89	0.90	0.79	0.63
	21-25	0.90	0.90	0.90	0.84	0.62
	26-30	0.91	0.90	0.90	0.86	0.71
	31-35	0.89	0.89	0.90	0.86	0.73
	36-40	0.84	0.84	0.85	0.81	0.70
High school graduates	1-5	0.49	0.43	0.36	0.35	0.18
	6-10	0.83	0.82	0.83	0.75	0.53
	11-15	0.93	0.91	0.93	0.88	0.76
	16-20	0.94	0.92	0.94	0.91	0.82
	21-25	0.94	0.94	0.95	0.91	0.80
	26-30	0.92	0.92	0.94	0.90	0.83
	31-35	0.78	0.84	0.87	0.81	0.73
	36-40	0.57	0.60	0.65	0.65	0.58
University graduates	1-5	0.77	0.77	0.77	0.72	0.56
	6-10	0.92	0.91	0.91	0.89	0.78
	11-15	0.97	0.97	0.97	0.93	0.86
	16-20	0.97	0.97	0.97	0.96	0.87
	21-25	0.95	0.95	0.97	0.95	0.88
	26-30	0.87	0.91	0.91	0.90	0.82
	31-35	0.64	0.74	0.79	0.79	0.72
	36-40	0.42	0.47	0.55	0.47	0.42

Table A4 Log monthly wage of Natives by Skill Cell, 2002-2015

Education	Years of Experience	1999	2002	2006	2010	2015
Lower secondary and below	1-5	6.386	6.699	6.946	6.569	6.596
	6-10	6.584	6.803	6.959	6.674	6.541
	11-15	6.675	6.783	6.959	6.779	6.512
	16-20	6.762	6.795	6.925	6.849	6.693
	21-25	6.848	6.807	6.993	6.901	6.633
	26-30	6.895	6.847	6.938	6.948	6.663
	31-35	6.896	6.810	6.950	6.987	6.730
	36-40	6.908	6.790	6.935	6.998	6.754
High school graduates	1-5	6.609	6.797	6.970	6.691	6.452
	6-10	6.698	6.825	7.002	6.804	6.565
	11-15	6.830	6.843	6.973	6.908	6.690
	16-20	6.932	6.849	6.967	6.970	6.757
	21-25	7.008	6.809	6.989	7.042	6.808
	26-30	7.060	6.808	6.988	7.119	6.822
	31-35	7.110	6.842	6.986	7.149	6.902
	36-40	7.120	6.790	6.974	7.173	6.916
University graduates	1-5	6.906	6.870	7.210	6.908	6.692
	6-10	6.970	6.842	7.205	7.049	6.833
	11-15	7.144	6.855	7.226	7.158	6.964
	16-20	7.212	6.843	7.203	7.206	7.056
	21-25	7.274	6.827	7.188	7.297	7.118
	26-30	7.278	6.853	7.206	7.321	7.109
	31-35	7.386	6.853	7.208	7.350	7.235
	36-40	7.354	6.992	7.198	7.381	7.153

Table A5 Average hours worked of Natives by Skill Cell, 1998-2015

Education	Years of Experience	1998	2002	2006	2010	2015
Lower secondary and below	1-5	41.112	41.459	38.794	38.339	45.100
	6-10	43.254	44.812	42.649	42.324	42.222
	11-15	45.066	44.789	43.621	42.628	42.310
	16-20	45.656	45.824	45.148	44.174	43.804
	21-25	45.357	45.412	45.084	45.063	44.290
	26-30	45.381	45.746	45.581	45.038	45.163
	31-35	44.674	45.137	45.446	44.657	43.863
	36-40	45.261	45.283	45.077	44.633	46.388
High school graduates	1-5	42.485	42.197	40.698	40.878	39.407
	6-10	44.334	43.547	43.427	42.844	42.161
	11-15	44.181	44.890	44.412	43.982	43.955
	16-20	44.088	44.044	45.435	44.204	43.539
	21-25	43.400	43.760	44.460	44.760	44.459
	26-30	43.399	45.090	44.667	44.156	43.979
	31-35	41.978	43.612	43.807	44.223	44.383
	36-40	42.324	43.677	44.068	43.797	42.716
University graduates	1-5	40.758	39.763	40.233	40.159	40.041
	6-10	40.599	40.940	40.832	40.983	40.369
	11-15	41.109	40.656	41.356	40.696	41.780
	16-20	40.245	39.964	40.116	39.869	41.385
	21-25	39.281	40.122	39.964	39.314	41.261
	26-30	39.538	38.243	38.715	38.897	39.117
	31-35	39.312	38.393	38.193	38.592	39.760
	36-40	38.571	39.741	40.434	39.831	40.530