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Housing Market Responses to Immigration;  
Evidence from Italy

Sona Kalantaryan



European University Institute  
**Robert Schuman Centre for Advanced Studies**  
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## **Abstract**

In this study I empirically examine the impact of immigration on the dynamics of housing prices across Italian provinces from 1996 till 2007. The massive debate upon the impact of current intensive immigration flows on the wellbeing of the native Italian population and Europeans in general is mainly focused on labor market outcomes which is, however, only one of the channels through which the real income and wealth can alter. This paper contributes to our understanding of the influence that recent intensive immigration flows have on the Italian economy by estimating its impact on the housing market. Moreover, it exploits different methodological approach with respect to the approach dominating in migration literature. Using the number of valid residence permits as a measure of immigration stock and the self-reported housing values from the Survey of Households Income Wealth in Italy I find that the increase in the concentration of immigrants in the Italian provinces has a positive but declining effect on the average housing prices in provinces. The obtained results also indicate that an increase of in immigrant population leads to an increase in average housing prices. The performed Difference and System GMM estimations confirm both the positive response of average housing prices to the increase in immigrant population and the non-linearity of its response to immigrants' concentration in all specifications.

## **Keywords**

Housing market, Immigration, GMM, House prices, Italy





## 1. Introduction and Motivation

The recent sharp increase in the intensity of labor force mobility has generated a massive stream of economic literature dedicated to the influence of immigration on host economies. Moreover, there are active and open political debates going on regarding the influence of immigrants on the wellbeing of native populations. The scale and intensity of the current research covers many aspects. However, the prevailing part of economic literature on immigration is focused on the labor market outcomes; the vast majority of the ongoing research considers the impact of immigration on the employment opportunities and wages in the host countries<sup>1</sup>. Still, immigration may influence the host economy not only through the supply but also through the demand side. A more comprehensive understanding of any impact can be reached by considering immigrants not only as extra labor force with possibly different labor force characteristics, but also as extra consumers with potentially different preferences in the consumption process.

Estimates of the changes in employment and wages alone do not allow for a full evaluation of the effect of immigrants on the real income and real wealth of population in the destination countries. Despite their insightfulness, these results tell only part of the story. If the ultimate interest is the effect of immigration on the real income of population, then the impact on prices should be taken into account as well. Moreover, changes in relative prices may have distributional effects in addition to those arising from changes in wages.

Despite the intensity of current economic research addressing the impact of immigration on labor market outcomes, empirical studies do not find much evidence that immigration largely alters wages. For example, the meta-analysis carried out in Poot and Cochrane (2005) based on eighteen published papers from the international literature suggests that the effect of immigration on local wages is very mild: an increase in the share of immigrants in the local labor force by 1 percentage point leads to less than a 0.1 percent reduction in wages. The economic literature proposes three possible reasons to explain the absence of a strong reaction of wages to immigration. First, natives may choose to avoid areas densely populated by immigrants; they might be frightened by the competition they face in the local labor market due to immigrants inflow (Filer, 1992). Second, immigrants may choose the cities with a positive shock in productivity and wage growth. Finally, the labor market is more elastic than is considered appreciated (Lewis, 2004).

Migrants usually carry not only their skills but also their traditions, customs and attitudes to the country of destination, which makes them different from natives in many respects. *Inter alii*, the cultural background affects the behavior of immigrants as consumers. The resulting shift in the composition of consumers affects not only the scale but also the structure of the consumption of goods and services in the destination countries. Those changes in turn alter the structure of aggregate demand. The effect is more vivid once the supply for a particular good or service is relatively inelastic; the shifts in demand lead to changes in prices at least in the short run. The housing market characteristics seem to fit the described case; the supply is relatively inelastic. Hence, the shift in housing demand due to the inflow of immigrants can alter the housing prices in the area. The resulting changes cannot leave the real income and wealth of those previously living in the area unaltered because: (a) housing represents a considerable share of households' wealth; and (b) the housing-related expenses represent an important part of the overall expenses for the majority of households. The dynamics of housing prices is a key factor in the reallocation of household wealth (Davies and Shorrocks, 2000), interacting with financial asset prices (Sutton, 2002) and conditioning labor mobility (Cannari, Sestito and Nucci, 2000).

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<sup>1</sup> See, for example, Brucker and Jahn (2008), Clark and Drinkwater (2008).

Taking into account the above-mentioned arguments, in this study I evaluate the influence of immigration on the Italian housing market. The choice of the Italian housing market as the subject for empirical estimation is motivated by several reasons. First, Italy was traditionally considered as a country facing continuous waves of emmigration. The situation has changed dramatically only recently. Immigration has become one of the most distinct features of the Italian economic reality during the last two decades. The country has become a desirable destination for hundreds of thousands of immigrants with European and non-European origins. The number of legally registered immigrants increased from 648,000 to 2,414,000 from 1992 to 2007. However, the intensity of immigration flows has not been homogeneous across the Italian provinces. Figure 1 in the Appendix illustrates changes in the distribution of immigrants in absolute values and its concentration in the total population in provinces during the relevant period. If in 1996 the median province had around 1 percent of immigrants in the total population, then in ten years it reached 5 percent. Such drastic changes could not leave the local housing markets uninfluenced. Second, the peculiarities of Italian financial markets are such that houses or real estate in general serve as an alternative way of wealth accumulation for many Italian families. Italian households have very strong preferences towards housing wealth (Brandolini et al., 2004; Faiella and Neri, 2004) and particularly towards owner occupation (Paiella, 2001; Di Addario, 2002). For the considered period, dwellings constituted approximately 80 percent of total real assets of Italian households (Cannari et al., 2008). Third, according to Del Boca and Venturini (2003) and Bruecher et al (2011), the Italian population is immobile within the country; hence, the inflow of immigrants coupled with the immobility of natives can intensify changes in local demand for housing units and housing prices. Investigation of the link between international immigration and housing prices in Italy can serve as a good opportunity: (a) to extend existing research on the subject of the housing market response in European regions; and (b) to enhance the understanding of the influence that immigration has on the real income and wealth of population in Italy.

The economic theory suggests that immigration affects prices through different and opposing mechanisms making the overall effect ambiguous and difficult to predict. It affects both aggregate supply and aggregate demand in the host economies. The inflow of immigrants alters the aggregate supply by changing the overall composition of the labor force. Those changes in their turn affect the relative wages of different skill groups causing changes in production costs. Particularly, production costs may increase or decrease depending on the way the changes in the overall composition of labor supply affect relative wages. In a fully traded economy, it would not translate into changes in output prices, but would rather result in changes in the factor intensity or output mix. Still, part of the output is typically non-tradable. Hence, one can expect final prices to decrease for those goods and services produced at lower cost. An opposite effect is expected for those goods and services that immigration has made relatively more expensive to produce. Similarly, the effect of immigration on the demand side is ambiguous as well. It depends heavily on the changes that immigration may cause in the composition of consumers, which, in turn, transforms into changes in demand for goods and services. However, these changes are not necessarily homogenous across different goods and services.

The above-mentioned theoretical insights refer to the responses of prices to immigration in general. This study addresses the evaluation of the impact of immigration on the dynamics of a specific segment of market; i.e. the housing market. To draw correct inferences, a number of factors should be carefully examined; the response of both the demand and supply sides should be taken into consideration. Housing is considered as a non-tradable good with a relatively inelastic supply in the short term. Hence, qualitative and quantitative changes in housing demand caused by intensive immigration may be translated into changes in local housing prices and rents. However, the direction of these changes is not easy to predict. Immigrants, as additional consumers, do not only generate a simple increase in the aggregate demand for residential units but they might also change its composition. In fact, foreign population may differ from natives in many respects including tastes. Immigrants may have different tastes from natives. For example, due to their relatively low income they may be obliged to occupy relatively cheap housing units, or choose to live in overcrowded flats.

The dynamics of housing prices due to the inflow of immigrants also depends on the reaction of natives to the inflow of foreign nationals into the area. Several factors determine the attitude of natives towards immigrants. Among those, one of the crucial ones is the nature of competition between natives and immigrants in the labor market. If immigrants and natives are complements in the production process, then immigrants as additional consumers may increase housing demand, which may translate into an *increase* in the local housing prices and rents. However, if immigrants and natives are substitutes in the labor market, natives will prefer to leave the areas where immigrants are overrepresented to avoid possible competition. In this case, the outflow of natives may neutralize the effect of immigration on the local housing market. As a result, prices might *decrease* or remain *unchanged*. Although the housing market can be one of the major non-labor market channels through which immigrants can influence the well being of natives, the overall demand effects are not clear *a priori*. The uncertainty about the direction and magnitude of the final effect leaves room for further empirical analysis.

This study contributes to the existing literature in the following ways: First, it contributes to the recently emerging branch of literature dedicated to the influence of immigration on prices in general. Second, the existing studies address the issues related to the impact of immigration on the dynamics of housing prices almost exclusively focusing on US immigration. However, the effects documented in those studies are not directly applicable to the European reality due to the fundamental differences in the nature of housing markets and immigration between the US and European countries. This study is performed on the subject of the Italian housing market, which makes it remarkable in a broader context; i.e. it gives insights into the impact of immigration in a European country. Moreover, the estimated impact may serve as a motivation for the future research related to impact of immigration on housing markets in the European region. Third, the Italian housing market has never been considered in the context of immigration flows by economic studies. This study enhances the understanding of the influence that the recent intensive immigration flows have on the Italian economy by investigating its impact on housing prices across the Italian provinces from 1996 to 2007.

Finally, it exploits a different empirical approach compared to those traditionally used in the migration literature. Particularly, the lagged values of immigration flows are proposed as instrumental variables to tackle the problems arising from the endogeneity of current immigration. The Difference and System Generalized Method of Moments techniques are used to obtain estimates the reliability of which is not undermined by concerns arising from the likely endogeneity of immigration flows to housing prices.

The rest of the paper is organized in the following way. Section (2) presents and analyzes the related literature. Section (3) presents the methodological approach applied to identify the impact of immigration on housing prices; i.e. it discusses the potential problems for identification and proposes suitable strategies to solve them. Section (4) describes the data. Section (5) reports and discusses the results. Section (6) concludes the paper.

## **2. Related Literature**

This section summarizes the existing literature on three closely related topics in the following sequence. First, the studies addressing the impact of immigration on prices in general are presented. Then, the discussion focuses on the studies investigating the influence of immigration on housing prices and rents. Finally, by taking into account the crucial importance of the migratory decision of natives as a response to the inflow of immigrants, the last subsection refers to the literature upon the displacement of natives by immigrants and its relevance for Italy during the relevant period.

## 2.1 Studies Considering the Effect of Immigration on Prices of Goods and Services

There are only few studies considering the effect of immigration on the dynamics of prices for goods and services. They are mainly single country analysis examining the impact of low-skilled immigrants on the dynamics of prices of different goods and services. Moreover, these studies are focused on the countries considered as the traditional destinations for immigration flows, such as the USA, Canada and New Zealand.

To the best of my knowledge, there are three main recent articles, which consider the influence of immigration on the dynamics of prices. The issue was first elucidated in Cortes (2008) and then in Frattini (2008), who investigate the effect of immigration on prices in the UK and in the USA, respectively. According to Cortes (2008) and Frattini (2008) immigration has significant, however, quantitatively limited effects on prices. Moreover, the effect is different for services and tradable goods. Cortes (2008) is the first study, which considers the impact of low-skilled immigration on the price dynamics in the USA. The empirical results presented in the study suggest that a 1 per cent increase in the ratio of immigrant to native leads to up to a 0.2 per cent decrease in the prices of services. These results are also confirmed in Frattini (2008) where changes in price dynamics due to immigration shocks in the UK from 1996 to 2006 are considered. This empirical study states that immigration had dual effect on prices in the UK during the considered period. On the one hand, the immigration contributed to the reduction of price growth of services in the sectors where the concentration of low-wage workers is high. The estimated effect is stronger for prices of such services as restaurants, bars and take-away food. The inflow of the relatively cheap labor force led to a reduction in the production costs of these services during the considered period. Moreover, the reduction in prices could be due to the increased competition in the sectors providing these services; very often immigrants run bars or small restaurants, hence the inflow of immigrants could increase competition in these sectors. In other words, the observed *negative* effect is probably achieved through the labor supply channel. On the other hand, an opposite effect is documented for the prices of low-value grocery goods. The inflow of immigrants could lead to an increase in the demand for these goods, which later could be translated into changes in their prices. Hence, in this case prices were probably influenced through the demand channel.

Lach (2007) finds some opposite results; his empirical study documents a reduction in the grocery prices because of immigration shock. However, it is necessary to mention that Lach (2007) examines the dynamics of prices following the unexpected arrival of a large number of immigrants from the former Soviet Union to Israel during the 1990s. After controlling for the size of native population, city and time effects, the obtained results show that a 1 percentage point increase in the ratio of immigrants to native population in a city leads to a 0.5 percentage point decrease in prices. However, the documented negative effect can be explained by the fact that former Soviet Union immigrants had higher price elasticity and lower search costs than the native population. Actually, most of them were not active in the labor market. The reality of market economy where the inexperienced immigrants suddenly appeared could motivate grocery shopkeepers to attract new potential customers by a temporary decrease in prices.

The above-presented discussion indicates that immigration may, indeed, alter prices of goods and services. However, the effect is not identical for the whole range of prices and cannot be considered as a simple change in price scale. It rather generates changes in the distribution of prices with possible distributional consequences for the real income and wealth in the destination countries. The economic literature provides some evidence. For instance, Cortes (2008) claims that the inflow of low-skilled immigrants from 1980 to 2000 had a dual effect on the income and wealth of population. On the one hand, it led to an *increase* in the purchasing power of the high-skilled workers living in the 30 largest cities of the USA (one average by 0.32 percent). On the other hand, it *decreased* the purchasing power of native high school dropouts by 1 per cent (4.2 per cent of Hispanic low-skilled natives). Similarly, Frattini (2008) states that low-income households do not tend to consume the items which experienced the highest price reductions (food and drinks out of home, dry cleaning, hairdressing). Instead, a

positive price effect is found for goods (food and drinks) consumption of which is inversely proportional to household income. These results coupled with the wage effect estimated for the same period by Dustmann et al. (2008) suggest that the recent immigration indeed had income distributional effect in the UK.

## ***2.2 Studies Considering the Effect of Immigration on Housing Prices and Rents***

The impact of immigration on the dynamics of housing prices and rents can be considered as a particular case of immigrants' influence on prices in general. The existing economic studies addressing housing market responses to immigration do not share a common judgment; additionally, there is no consensus on the magnitude or the direction of the effect. The prevailing part of the scientific work are single country analysis, which complicates drawing general conclusions. Finally, the existing scientific work mainly focused on the housing markets of countries considered as traditional destinations for immigrants, such as the USA, Canada, New Zealand and Australia.

The research on the determinants of the price for low quality housing, which is popular among immigrants was mainly focused on the effects of zoning and land use regulation (Malpezzi and Green, 1996) or the profitability of constructing low quality housing (Ohls, 1975). The first studies documenting the response of the American housing market to the inflow of immigrants were conducted in the 1980s. For example, Muller and Espenshade (1985), Burnley, Murphy and Fagan (1997) as well as Ley and Tuchener (2001) find a strong relation between the inflow of immigrants and housing prices. However, these early studies have a rather descriptive nature. The first attempts to measure the influence of immigration on the US housing market were undertaken by Susin (2001) and Saiz (2003). These studies consider the impact of the Mariel boatlift on the rental prices in Miami, which added an extra 9 per cent to Miami's renter population in 1980. Using the difference in differences approach, Saiz (2003) found that the unexpected immigration shock led to an increase in rents in Miami from 8 to 11 per cent more than in the comparison groups between 1979 and 1981. By 1983, the rent differential was still significantly positive. The change in rents was mainly for dwellings occupied by the low-income Hispanic residents, probably because of the tendency of new immigrants to settle initially in the districts populated by Hispanic residents. The paper states that the rental price for units of higher quality was not affected by the immigration shock. For the same period, the relative housing prices moved in the opposite direction. Despite the relative increase in the rents in Miami, the immigration shock did not alter the rent to income ratio or the so-called "rent burden" in Miami (Greulich, Quigley and Raphael, 2005)<sup>2</sup>. The effect is estimated for rental units that were less likely to be occupied by immigrants. Card (2007), estimating the influence of immigrants on US cities, concludes that the magnitude of the effect estimated for average wages is very similar to the one found by Saiz (2007) for the housing market. Hence, the so-called "rent burden" remains roughly constant. The "Mariel boatlift" case described in Saiz (2003) and Susin (2001) is very special (at a particular point of time and in a particular city) and could hardly be generalized. However, these studies together with the previously mentioned ones suggests that the labor market is not the only channel through which immigration can influence natives.

An attempt to obtain a more general picture of the impact of immigration on housing rents in American cities can be found in the more recent studies. For example, Saiz (2007) finds a positive association between rent growth and immigration inflows for all metropolitan areas; a 1 per cent inflow of immigrants to a city population leads to a 1 per cent increase in average rent and almost a 3 per cent rise in housing values. These results confirm the author's initial expectations that the magnitude of response of the housing market to immigration is much bigger than the one observed in the labor market. This fact can at least partially explain the irresponsiveness of wages to immigration shocks.

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<sup>2</sup> "Rent burden" is defined as the rent to income ratio.

The further extension of research in this particular direction was made through the simultaneous consideration of the labor and housing markets. Particularly, Ottaviano and Peri (2007) use a general equilibrium approach to evaluate the effect of immigration flows on the skill-segmented labor and housing markets in the USA. The model developed by the authors predicts that the inflow of immigrants is associated with higher average wages and higher average rents in the long run. The rental prices of the units occupied by highly educated residents are more sensitive to immigration compared with those occupied by low-educated residents. In regards to wages, the model predicts the largest positive effect for the most educated residents and some small negative effect for the least educated ones. The testing of the theoretical model predictions using the real data confirms the following. First, due to the complementarity between natives and immigrants in the production process, the overall effect is positive for natives. Second, the inflow of educated immigrants increases competition for housing in the best areas and lifts the rental prices from 0.6 up to 2.3 percent<sup>3</sup>. Finally, each education group receives a positive transfer from immigrants due to a higher house ownership rate.

New Zealand along with the USA, Canada and Australia is another country traditionally considered as one of the main destinations for immigration flows. Hence, one can expect results similar to those found for the American housing market (Saiz, 2006; Ottaviano and Peri 2012). However, the results found for New Zealand are somewhat different. Stillman and Mare (2008) empirically estimate the response of the housing market to immigration shocks in New Zealand from 1986 to 2006. The estimation results suggest that a 1 per cent increase population in the area is associated with an 0.2 to 0.5 percent increase in local housing prices. However, the authors find no evidence for a positive relationship between the inflow of foreign-born immigrants to an area and local housing prices. The only strong positive relationship is found between the inflows of New Zealanders previously living abroad into an area and local housing prices, which, however, is not robust over time.

With the exception of the study by Gonzales and Ortega (2013), to the best of my knowledge, there has been no economic research considering the link between international immigration and the price of urban housing in European countries. Gonzales and Ortega (2013) estimate the effect of recent intense immigration (it increased the share of foreign nationals in the labor force from 2 to 14 per cent) on the dynamics of housing prices and residential construction activity in Spain from the period of 1998 to 2008. During the mentioned period, Spain was experiencing both a spectacular immigration and an impressive housing market boom<sup>4</sup>. The authors find a sizeable causal effect for immigration on the dynamics of the housing market both in terms of quantities and in terms of prices. The inflow of immigrants led to an appreciation of housing prices by about 52 per cent and it was responsible for 37 per cent of the total construction of new housing units during the relevant period.

The above presented literature review leads to the following conclusions. First, the prevailing part of the conducted studies is focused on countries traditionally considered as main destinations for immigration flows<sup>5</sup>. In other words, immigration has always been an important factor shaping the demographic reality of these countries. Second, the existing economic literature does not provide common judgment either upon the magnitude or even on the direction of the effect of immigration on the housing market.

### ***2.3 Studies Considering the Displacement of Natives by Immigrants***

The effect of immigration on the local housing prices depends, to a great extent, on the reaction of natives on the presence of immigrants in the area. The absence of housing price effects does not

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<sup>3</sup> The second finding contradicts the results of Saiz (2003) who estimates the strongest effect for the low quality dwellings occupied by Hispanic immigrants.

<sup>4</sup> The average Spanish province had an immigrant inflow equal to 17 per cent of its initial working-age population

<sup>5</sup> See, for example, Saiz (2003), Saiz (2007), Ottaviano and Peri (2007), Card (2007) etc.

necessarily imply the absence of immigrants' impact on housing opportunities of the formerly residing population. If there is a sizable displacement of natives due to the inflow of immigrants, then the cross-province estimates will not capture the full impact on housing prices. In other words, if immigrants displace natives, then the local housing price effect will be attenuated. If the displacement has a one to one nature, in the case of perfect substitution, then the price effect should vanish completely. The modest displacement will provide information upon the upper bounds of the full magnitude of effects<sup>6</sup>.

The effect of immigration on the migration decision of natives depends on several factors. On the one hand, the key factor often defining the destination of immigrants is the existence of prior enclaves of their compatriots in the area due to higher probability to be supported by them (Pedersen, Pytlikova and Smith, 2008). On the other hand, the attitude of natives towards immigrants is heavily influenced by the complementarity or substitutability between the two factors in the labor market. Particularly, if immigrants and natives are complements in the production process, then the areas where immigrants settle will become more attractive for natives as well. Exactly the opposite is expected, if natives and immigrants are substitutes in the production process. In this case, natives can consider the areas densely populated by immigrants as less attractive. Particularly, natives might avoid those areas due to the fear to face the competition created by immigrants in the local labor market.

People usually form their opinion based on the economic situation in the country and relying on the information spread through the mass media. Recently held social surveys show that Italians consider the inflow of foreign workers as a negative phenomenon<sup>7</sup>. They believe that immigrants depress wages, worsen the skill-intensity of the economy and hurt natives, especially the less-educated ones. However, economic research does not support this popular opinion. There are a number of economic studies addressing the impact of immigration on the Italian economy. For instance, a comprehensive analysis of Italian emigration and immigration is presented in Del Boca and Venturini (2003). Another study undertaken by Gavosto, Venturini and Villosio (1999) addresses the impact of immigration on wages and the employment of natives in Italy. The results indicate that the concentration of immigrants in the labor force is positively associated with the wage growth of natives. The complementarity effect is stronger for the northern regions, for blue collar workers and for small companies. Moreover, the results point to the non-linearity in the response of the Italian labor market to the presence of immigrants; as soon as the share of foreign workers reaches 7.7 per cent in regions and sectors foreign nationals begin to compete with natives in the Italian labor market. Similar results are documented in Venturini and Villosio (2002) where the authors discuss the effect of foreign concentration in the labor force on the employment opportunities of natives. The estimates show that the probability of moving from "employed" to "unemployed" either decreases or is not statistically significant once the share of foreign nationals increases. Moreover, immigrants have a positive effect on the probability of finding new jobs for natives. Still, the obtained estimates indicate some slightly negative effect on the probability of finding work for young people looking for their first job (Venturini and Villosio, 2002).

Overall, the existing studies indicate the dominance of complementarity between immigrants and natives in the Italian labor market. However, the extent of an empirical research is usually constrained by the availability of data. The above-presented results are obtained using the number of legally present immigrants as a measure of the foreign presence in Italy. Yet, the continuous increase in the irregularly present foreign nationals eager to accept lower wages may stimulate an enlargement of the

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<sup>6</sup> The economic literature considering the displacement of natives by immigrants in the USA concludes that there is no "one-to-one" offsetting outflow of natives caused by the inflow of immigrants. For comprehensive research on possible displacement and size in the USA see, for example, Card and DiNardo (2000), Card (2001, 2005), Federman, Harrington, and Krynski (2006), Ottaviano and Peri (2007).

<sup>7</sup> See for example 1995 ISSP, National Identity Module or "Demoskopia" survey held by Fondazione Rodolfo DEBENEDETTI (fRDB) in 2003.

shadow economy causing a flow of capital from the legal sector to the illegal one. Hence, irregular immigrants can indirectly compete with natives both in irregular and regular markets by stimulating the growth of the irregular economy by injuring the regular economy (Del Boca and Venturini, 2003). Italian immigrants do not seem to be in competition with natives in the irregular labor market (Venturini, 1999). Moreover, the general pattern for Italian immigrant workers appears to be a fragmented career restricted to seasonal or temporary jobs alternating between legal and illegal employment (Venturini and Villosio, 2006, 2008). Consequently, one can conclude that there is no direct competition between natives and immigrant workers in Italy. The above-described results, coupled with Italian labor force immobility, suppose that at least on the provincial level, there is no displacement of natives caused by immigrants through competition in the Italian labor market.

### 3. Methodological Approach

This section presents the methodological approach used to estimate the impact of immigration on the average housing prices in the Italian provinces. The empirical estimation in this field contains a number of challenges. Hence, it is useful to present the potential problems and the proposed solutions in a sequence. First, the baseline model is presented, which is followed by a discussion upon the potential identification problems that may undermine the reliability of the obtained estimates. Second, the first difference approach is proposed as a solution for some identification issues, which, however, leaves a number of unresolved concerns. Finally, the Difference and System Generalized Method of Moments (GMM) are proposed as more complex solutions for the identification of immigrants' impact on housing prices.

#### 3.1 Empirical Strategy

To estimate the impact of immigration on the dynamics of the average housing values in Italian provinces, two specifications are separately considered. In both specifications, the dependent variable is the logarithm of the average housing prices per square meter in provinces in a particular point of time. The main difference between the two specifications is the manner that the main explanatory variable, i.e. immigration, enters the model. In the first specification, the log number of immigrants is used to capture the impact of immigration. In the second specification, the main explanatory variable is the concentration of immigrants expressed as the ratio of the number of immigrants over total population in provinces<sup>8</sup>. The first and the second empirical specifications are formally presented in, respectively, equations (1) and (2).

##### Specification 1

$$\ln(P_{it}) = \beta \ln(IMM_{it}) + \gamma \ln(NAT_{it}) + \delta \mathbf{W}_{it} + \mu_t + \varphi_i + \varepsilon_{it} \quad (1)$$

##### Specification 2

$$\ln(P_{it}) = \beta \frac{IMM_{it}}{POP_{it}} + \delta \mathbf{W}_{it} + \mu_t + \varphi_i + \varepsilon_{it} \quad (2)$$

$\ln(P_{it})$  is the dependent variable; i.e. the log mean value of a square meter of housing in province  $i$  and time period  $t$ . In the first specification,  $\ln(IMM_{it})$  is the main explanatory variable: the stock of immigrants in a province measured as the log number of valid residence permits in province  $i$  in time period  $t$ .  $\ln(NAT_{it})$  is the log native population in province  $i$  in time period  $t$ . The model constructed in this way lets  $\beta$  capture the effect of immigrants on housing prices separately from the effect generated by natives. The resulting coefficient  $\beta$  has the following interpretation: the percentage change in housing price as a result of a 1 per cent increase in immigrant population in the province.

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<sup>8</sup> Housing data comes from a biennial survey. Hence, the time between two sequential observations is two years.



Alternatively, in the second specification presented in equation (2) the impact of immigration on the dynamics of housing values is captured using the concentration of immigrants ( $\frac{IMM_{it}}{POP_{it}}$ ) as the measure of foreign presence. This specification has log level form and assumes the so-called semi-elasticity of housing prices with respect to the concentration of immigrants.  $\beta$  captures the effect of changes in the concentration of immigrants on the value of residential units and has the following interpretation: the percentage change of housing prices as a result of changes in the concentration of immigrants ( $\% \Delta$  housing prices =  $(100\beta) \Delta$  concentration of immigrants). In both specifications,  $\mathbf{W}_{it}$  represents a set of macroeconomic variables (such as employment rate and GDP *per capita*), which are supposed to capture the disparity in housing prices due to the differences in economic conditions between provinces.  $\mu_t$  is a set of year dummies, which captures the national trends in inflation and other macroeconomic processes.  $\varphi_i$  is a set of province dummies, which captures time-invariant province-specific characteristics. Finally,  $\varepsilon_{it}$  is the idiosyncratic error.

These two specifications are very similar and it would be reasonable to use the main dependent variable as the log concentration of immigrants instead. This specification would impose some restrictions on the model; the coefficients at the log number of immigrants and at the log population must sum up to zero. I estimated the first specification using log population instead of log natives and tested the restriction: ( $H_0: \beta = -\gamma$ ). I could not reject the hypothesis at any statistically significant level: (F (1, 476) = 0.03, with p-value = 0.868). However, I could also not reject ( $H_0: \beta = \gamma$ ): (F (1, 476) = 0.00, with p-value = 0.999). These ambiguous results, which can perhaps be explained by the large standard error of  $\gamma$ , held from using the log concentration of immigrants in the estimations.

Obviously, the pooled OLS technique applied to the models would lead to biased and inconsistent estimates due to the violation of the crucial assumption: that is contemporaneous exogeneity unconditional on unobserved heterogeneity. If  $\varphi_i$  is uncorrelated with other covariates, then it is just another unobserved factor, which affects housing prices without being systematically correlated with the observables. However, if  $\varphi_i$  is correlated with the explanatory variables then putting it into the error term can cause serious problems. In this empirical study the time-invariant province specific characteristics are, for example, the geographic position, the level of urbanization and the industrial structure of provinces. Those are important factors defining local housing prices, which are also likely to be correlated with the intensity of immigration flows to the provinces. This fact rules out the possibility of applying the random effects estimation technique too. To address this issue, the econometric theory suggests using the so-called fixed effects approach. Under certain assumptions, it eliminates the individual effects by transforming the initial variables in a particular way; first differencing or within group transformation is usually applied. Although the estimation is performed on the transformed model, the interpretation of coefficients remains unaltered. Considering the fact that the results are further verified by the Difference and System GMM approaches, it is more appropriate to choose the first difference technique. It requires strict exogeneity of the explanatory variables conditional on unobserved heterogeneity. In reality, it is sufficient that the error term  $\varepsilon_{it}$  is uncorrelated with the explanatory variables in time  $t-1$ ,  $t$  and  $t+1$ . Equations (3) and (4) formally present this assumption for the first and the second specification respectively.

$$E[\varepsilon_{it} | \ln(IMM_{it-1}), \ln(IMM_{it}), \ln(IMM_{it+1}), \dots \\ \dots \ln(NAT_{it-1}), \ln(NAT_{it}), \ln(NAT_{it+1}), \mathbf{W}_{it-1}, \mathbf{W}_{it}, \mathbf{W}_{it+1}, \varphi_i, \mu_t] = 0 \quad (3)$$

$$E \left[ \varepsilon_{it} \mid \frac{IMM_{it-1}}{POP_{it-1}}, \frac{IMM_{it}}{POP_{it}}, \frac{IMM_{it+1}}{POP_{it+1}}, \mathbf{W}_{it-1}, \mathbf{W}_{it}, \mathbf{W}_{it+1}, \varphi_i, \mu_t \right] = 0 \quad (4)$$

The transformed versions of the first and the second specifications are presented in equations (5) and (6).

$$\Delta \ln(P_{it}) = \beta \Delta \ln(IMM_{it}) + \gamma \Delta \ln(NAT_{it}) + \delta \Delta \mathbf{W}_{it} + \Delta \mu_t + \Delta \varepsilon_{it} \quad (5)$$

$$\Delta \ln(P_{it}) = \beta \Delta \frac{IMM_{it}}{POP_{it}} + \delta \Delta \mathbf{W}_{it} + \Delta \mu_t + \Delta \varepsilon_{it} \quad (6)$$

The economic literature on immigration suggests that the direction and the magnitude of the immigrants' impact on the local housing prices and rents depend on the relationship between immigrants and natives in the local labor market (Ottaviano and Peri, 2012, Saiz, 2007). The economic studies addressing the complementarity or substitutability between immigrants and natives in the Italian labor market find that the general impact of immigration on the labor market outcome for natives is positive. However, the results also suggest that when the share of immigrant workers reaches 3.3 per cent of total employment, the positive impact of immigrants on native wages starts declining. Moreover, it turns negative once the share of immigrants reaches 5.8 per cent (Gavosto, Venturini and Vilossio, 1999). The non-linear impact of immigration detected in Italian labor market indicates that the impact on local housing markets might be non-linear as well. To verify this hypothesis, we compare the results of estimates with and without inclusion of the squared terms of the main dependent variable.

The first specification, presented in equation (1), assumes a constant elasticity of housing prices with respect to the number of immigrants in provinces. The inclusion of the squared term of log number of immigrants allows capturing additional nonlinearities; the statistically significant coefficient at the squared term will suggest a non-constant elasticity of housing prices with respect to the number of immigrants. The original and transformed models with inclusion of the squared term of log number of immigrants are presented in equation (7) and (8) respectively.

$$\ln(P_{it}) = \beta \ln(IMM_{it}) + \rho (\ln IMM_{it})^2 + \gamma \ln(POP_{it}) + \delta \mathbf{W}_{it} + \mu_t + \varphi_i + \varepsilon_{it} \quad (7)$$

$$\Delta \ln(P_{it}) = \beta \Delta \ln(IMM_{it}) + \rho \Delta (\ln IMM_{it})^2 + \gamma \Delta \ln(POP_{it}) + \delta \Delta \mathbf{W}_{it} + \Delta \mu_t + \Delta \varepsilon_{it} \quad (8)$$

For the second specification, the inclusion of the squared term allows capturing nonlinear response of housing values to the changes in immigrants' concentration. The original and transformed models with inclusion of the squared term immigrants' concentration are presented in equation (9) and (10) respectively.

$$\ln(P_{it}) = \beta \left( \frac{IMM_{it}}{POP_{it}} \right) + \rho \left( \frac{IMM_{it}}{POP_{it}} \right)^2 + \delta \mathbf{W}_{it} + \mu_t + \varphi_i + \varepsilon_{it} \quad (9)$$

$$\Delta \ln(P_{it}) = \beta \Delta \left( \frac{IMM_{it}}{POP_{it}} \right) + \rho \Delta \left( \frac{IMM_{it}}{POP_{it}} \right)^2 + \delta \Delta \mathbf{W}_{it} + \Delta \mu_t + \Delta \varepsilon_{it} \quad (10)$$

### 3.2 Potential Problems

The first difference approach addresses the concerns related to the time-invariant province-specific effects. In this subsection I discuss whether the evidence provided by the first difference estimation can be directly attributed to the causal effect of immigration on the dynamics of housing prices. Particularly, we present the potential drawbacks and possible remedies.

In this study, the number of valid residence permits issued by the Italian Ministry of Interior is used to measure the stock of immigrants in the provinces. Due to the administrative nature of the source, this dataset only provides information for legal immigrants and says nothing about illegal ones. However, illegal migrants influence the housing market as well and do not necessarily have the same distribution pattern as legal ones across Italy. This might lead to drawbacks related to *measurement*

*error*. Immigration is a quite recent phenomenon for Italy, which started in the 1980s. The initially unplanned immigration and the absence of an appropriate control created numerous illegal immigrants in Italy. The number of irregularly present foreign nationals in 2008 stood at between 279,000 to 461,000 (Kovacheva and Vogel, 2009). Measuring immigration stock by using the number of officially present foreign nationals without taking into account illegal immigrants, will lead to a bias in estimates. The econometric theory suggests that in the presence of the classical error in the variable (CEV), the OLS generally produces inconsistent estimates. Moreover, the measurement error leads to attenuation bias in the OLS estimates; if the true effect is positive (negative) then the OLS estimator will tend to underestimate (overestimate) it (Wooldridge, 2002). Bianci et al. (2008) compared the number of legal (number of valid residence permits) and illegal immigrants (number of demands for regularization) in 1995, 1998 and 2002<sup>9</sup>. The results suggest that, after controlling for province and year fixed effects, regular immigrants are approximately proportional to total (legal plus illegal) immigrant population in each province-year<sup>10</sup>. The above-mentioned arguments assume that including time and province dummies helps to reduce the bias created by measurement error due to the administrative nature of the dataset<sup>11</sup>.

The *reverse causality* complicates the identification of immigrants' impact on the dynamics of housing prices as well. Housing prices by themselves may play an important role for immigrants while choosing where they go in the host country. Immigrants may tend to avoid regions where, given similar employment rates and GDP, housing prices are higher. In this case, the estimates will be downward biased. Nevertheless, immigrants might also be influenced by cheap available housing in depressed areas or may be especially attracted to areas with declining industries (Filer, 1992).

The inflow of immigrants may make natives avoid or leave areas densely populated by immigrants. The possibility of *native displacement* by immigrants is discussed in Filer (1992), Card (2001), Card and DiNardo (2000) etc. The outflow of native population can be motivated by the fear of facing competition in the labor market. The shift in housing demand and the consequent increase in housing prices caused by the inflow of immigrants may also lead to the outflow of those natives that are more sensitive to the increase in housing prices. The displacement of natives from the area can weaken the effect of immigrants on housing prices; part of the effect would take place through native displacement. In fact, if immigrants cause "one-to-one" outflow of natives there will be no shift in local housing demand, hence with a fixed housing supply, housing prices will not be altered. The existence of positive effect on housing prices will suggest either no displacement or at least the absence of "one-to-one" displacement.

Finally, the reliability of the first difference estimates can be undermined by the *omitted variable* problem. Indeed, the location choice of immigrants can be motivated by the unobserved factors, which influence the dynamics of housing prices as well. Suppose that, for some reason, some provinces became more attractive (for example, expectation of future improvement of economic conditions or amenities). This will lead to a more intensive flow of immigrants and natives; hence, to higher housing prices. In this case, the omitted variables would lead to overestimation of the impact.

The discussion presented in this section suggests that different forms of endogeneity may undermine the reliability of the first difference estimates. However, the direction of bias depends on many factors and it is not easy to predict; obtained results are subject to further justification.

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<sup>9</sup> Regularizations in 1995, 1998, and 2002 involved, respectively, 246,000, 217,000 and 700,000 individuals, (Bianci et al., 2008).

<sup>10</sup> The relationship between actual and official immigration in both the province and year fixed effect are taken into account and are the following: the OLS estimated coefficient of is 0.92 and the  $R^2$  is 99%. For further details see Bianci et al.(2008).

<sup>11</sup> The specification proposes by Bianci et al. (2008) actually would just impose the already discussed restrictions. As was already mentioned, the large standard errors of  $\gamma$  withheld me from using log concentration of immigrants in the estimations.

### 3.3 Instrumental Variable, Difference and System GMM

This subsection presents the strategy, which was applied to treat the previously discussed endogeneity issues. The econometric theory suggests using the instrumental variable approach as a plausible strategy in identifying the causal effect when the explanatory variables are suspected to be correlated with the error term.

It is well stated in the economic literature that a number of non-economic factors determine the decision regarding the destination of international immigrants. Particularly, the existence of prior enclaves of immigrants from a particular country is an important magnet for future flows from it. Indeed, it is reasonable to expect that the network effect plays a significant role for immigrants in choosing their destination; new immigrants tend to settle in areas that are relatively densely populated by their compatriots so as to be able to benefit from their support. The economic literature on migration provides rich evidence in support of this theory. The possibility to live among people speaking the same language and having similar cultural traditions makes particular regions more attractive for newcomers (Pedersen *et al.*, 2008; Carrington *et al.*, 1996). The correlation between the current and historical settlement patterns of immigrants frequently motivates economists to use the historical patterns as an instrument for determining current ones. In other words, the historical information about immigrants' settlements is often used to construct an instrumental variable for immigration flows (Card, 2000; Saiz, 2007; Cortes, 2008; Ottaviano and Peri, 2007; McKenzie and Rapoport, 2010).

The instrument used in this study is based not only on the historical settlement of overall immigration stock, but also on its composition based on the country of origin. The validity of this instrument relies on the following assumption: "country of origin-province" initial distribution is not correlated with the demand shocks, which the provinces face in the later periods. The predicted stock of immigrants is calculated according to the formula presented in equation (11).

$$\overline{IMM}_{it} = \sum_c \vartheta_{i,c,t=0} \cdot IMM_{Italy,c,t} \quad (11)$$

Where  $\vartheta_{i,c,t=0}$ , is the fraction of immigrants from country or area  $c$  who settled in province  $i$  in the period  $t=0$ .  $IMM_{Italy,c,t}$  is the number of immigrants from country or area  $c$  that lives in Italy in period  $t$ . Here as well, the information upon the number of resident permits is used to construct the instrumental variable. Fortunately, the information on the country of origin of immigrants is available at the province level. First, the thirty-seven largest donor countries are considered separately. The rest of the countries are grouped based on geographic criteria. The resulting nine geographic groups are the following: Central Europe, Other Europe, Former Soviet Union, Asia, Northern Africa, Southern Africa, Southern America, Central America, Australia and Oceania. A detailed description is presented in Table 5 in the Appendix.

The result of the univariate regression confirms that the instrument fits the actual changes of immigrant population.

$$\Delta IMM_{it} = 1410,257 + 0,671 \Delta \overline{IMM}_{it}$$

The coefficient at the instrument is significant at the 1 percent level. The F-statistic meets the requirements and is equal to 855.74. The result is robust to the inclusion of time dummies as well.

However, there are at least two reasons to apply a slightly different empirical approach in this particular work. The first reason is the peculiarities of the administrative territorial structure in Italy. Though the territory of Italy remained unaltered in the relevant period, the number of Italian provinces

has grown significantly. The creation of new provinces took place both by splitting the old ones and by the inclusion of some municipalities from different provinces. The exclusion of the modified provinces would lead to a loss of 15 out of 103 provinces. Moreover, the exclusion is not random; most of the reformed provinces are the main destinations for Italian immigrants. The second reason is the fact that the availability of only one instrument for the potentially endogenous explanatory variable leads to exact identification. It is possible to test if the excluded instruments are appropriately independent of the error process only if an equation is overidentified (Baum *et al.*, 2007).

These two facts motivate to search for an approach, which allows (a) avoiding the problems related to the “growing” number of provinces; and (b) evaluating the validity of the instruments. Particularly, the approach developed by Arellano and Bond (1991), Arellano and Bover (1995)/ Blundell and Bond (1998) can serve as a remedy. For example, Saiz (2007), while examining the impact of immigration on American cities, mentions the possibility of using the Arellano-Bond procedure; however, the autocorrelation detected in the data excluded this possibility in the study. By its nature this approach is close to the conventional instrument described in the previous paragraph. However, it allows us to avoid the exclusion of the “problematic” provinces. The Arellano and Bond (1991), Arellano and Bover (1995)/Blundell and Bond (1998) dynamic panel estimators are both general estimators developed for the following situations. First, the panel has “small” T and “large” N, i.e. it consists of few periods and relatively many individuals. Second, the estimated model has a linear functional form. Third, some explanatory variables are not strictly exogenous; they may be correlated with past and current realizations of the error. Finally, the approach allows the existence of fixed individual effects as well as heteroskedasticity and autocorrelation within but not across individuals (Roodman, 2006).

The estimators deal with the problematic issues discussed in the previous subsection simultaneously. First, like the first difference estimator, it tackles the unobserved individual heterogeneity by using the first difference or forward orthogonal transformation of the initial variables. Second, it deals with the endogenous regressors by using their lagged values as instruments. Both exogenous and endogenous variables are used in the first difference or the forward orthogonal transformation version<sup>12</sup>. While the exogenous variables are instrumented by themselves, the endogenous ones are instrumented by their lags in levels. To use the lagged endogenous variables as instruments, they must satisfy the validity requirements: (a) no autocorrelation in the error; and (b) some form of autocorrelation in the endogenous variables through time is required. The absence of serial correlation can be tested by the Arellano-Bond test. It is necessary to keep in mind that our model does not have a lagged dependent variable as a regressor. Hence, if order 2 serial correlation is detected, then the set of instruments must be restricted to lags 3 and longer<sup>13</sup>.

The Difference GMM model is based on the assumption of sequential exogeneity conditional on unobserved heterogeneity. In other words, the idiosyncratic error term in each time period is assumed to be uncorrelated with past and present values of the explanatory variables. Moreover, it can be correlated with future values of the explanatory variables. In this study, the sequential exogeneity conditional on unobserved heterogeneity is assumed for the log number of immigrants, while strict

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<sup>12</sup> Two transformations are usually used: “first difference” and “forward orthogonal deviation”. The first one has a weakness, because it amplifies the gaps in unbalance panels. Some missing  $P_{it}$  will generate missing  $\Delta P_{it}$  and  $\Delta P_{i,t+1}$  in transformed data. This stimulates the use of the second common transformation, called “forward orthogonal deviations” or “orthogonal deviations” (Arellano and Bover; 1995). It minimizes data loss, and motivates me to use it, instead, of the first difference. The forward orthogonal transformation of a variable is obtained by subtracting the average of all future available observations from the contemporaneous. For any variable  $y$  the transformation will take the following form:

$$y_{i,t+1}^* \equiv \sqrt{\frac{T_{it}}{T_{it+1}}} \left( y_{it} - \frac{1}{T_{it}} \sum_{s>t} y_{is} \right)$$

Where the sum is taken over all available future observations,  $T_{it}$  is the number of such observations.

<sup>13</sup> If the model contains the lagged dependent variable in the RHS, the set of instruments should start with even longer lags (Roodman, 2006).

exogeneity conditional on unobserved heterogeneity is assumed for the rest of the explanatory variables. For the first specification, this set of assumptions is formally presented in equation (12).

$$E[\varepsilon_{it} | \ln(IMM_i)^{t-3}, \ln(NAT_i)^T, \mathbf{W}_i^T, \mu_t, \varphi_i] = 0 \quad (12)$$

$$t = 2, 3, \dots, T$$

where  $\ln(IMM_i)^{t-3}$  is a vector of the lagged values of log number of immigrants beginning from the third lag<sup>14</sup>.  $\ln(NAT_i)^T, \mathbf{W}_i^T$  are the vectors of the strictly exogenous variables, where  $T$  superscripts stand for all time periods. This assumption implies the following moment restrictions to be held.

$$E[\ln(IMM_i)^{t-3} \Delta \varepsilon_{it}] =$$

$$= E[\ln(IMM_i)^{t-3} (\Delta \ln(P_{it}) - \beta \Delta \ln(IMM_{it}) - \gamma \Delta \ln(POP_{it}) - \delta \Delta \mathbf{W}_{it} - \Delta \mu_t)] = \mathbf{0} \quad (13)$$

$$t = 2, 3, \dots, T$$

For the second specification, the sequential exogeneity assumption can be formally presented in the following way:

$$E\left[\varepsilon_{it} \mid \left(\frac{IMM_i}{POP_i}\right)^{t-3}, \mathbf{W}_i^T, \mu_t, \varphi_i\right] = 0 \quad (14)$$

$$t = 2, 3, \dots, T$$

Where  $\left(\frac{IMM_i}{POP_i}\right)^{t-3}$  is a vector of lagged values of immigrants' concentration beginning from the third lag. This assumption implies the following moment restrictions to be held

$$E\left[\left(\frac{IMM_i}{POP_i}\right)^{t-3} \Delta \varepsilon_{it}\right] =$$

$$= E\left[\left(\frac{IMM_i}{POP_i}\right)^{t-3} \left(\Delta \ln(P_{it}) - \beta \Delta \left(\frac{IMM_{it}}{POP_{it}}\right) - \delta \Delta \mathbf{W}_{it} - \Delta \mu_t\right)\right] = \mathbf{0} \quad (15)$$

$$t = 2, 3, \dots, T$$

Blundell and Bond (1998) demonstrate that if the data generating process is very persistent or close to a random walk, then the untransformed lags are weak instruments for the transformed variables. In this case, the Difference GMM performs badly because past levels possess little information about future changes. The authors present an alternative ‘‘System GMM’’ strategy, which solves the so-called ‘‘weak instruments’’ problem and improves the efficiency of estimators; they suggest transforming the instruments to make them exogenous to the fixed effects instead of transforming the regressors. The validity of these additional moment conditions relies on the conditional stationarity of the endogenous

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<sup>14</sup> As instruments I use a set of lagged variables beginning from the third lag, because the Arellano–Bond test detects order 2 serial correlation in errors terms.

variable, which means that the endogenous variable is uncorrelated with the time-invariant province-specific effects. In our case it implies  $E(\Delta \ln(IMM_{it})\varphi_i) = 0$  for the first specification and  $E\left(\Delta \frac{IMM_{it}}{POP_{it}} \varphi_i\right) = 0$  for the second specification for all  $i$  and  $t$ . In other words,  $E(\ln(IMM_{it})|\varphi_i)$  and  $E\left(\frac{IMM_{it}}{POP_{it}}|\varphi_i\right)$  must be time-invariant. Again, the validity of those additional instruments depends on the assumption of no serial correlation in  $\varepsilon_{it}$ .

The additional moment conditions for the first and the second specifications are presented in equations (15) and (16) respectively:

$$\begin{aligned} & E[\Delta \ln(IMM_i)^{t-3} \varepsilon_{it}] = \\ & = E[\Delta \ln(IMM_i)^{t-3} (\ln(P_{it}) - \beta \ln(IMM_{it}) - \gamma \ln(POP_{it}) - \delta \mathbf{W}_{it} - \mu_t - \varphi_i)] = 0 \end{aligned} \quad (16)$$

$$\begin{aligned} & E\left[\Delta \left(\frac{IMM_i}{POP_i}\right)^{t-3} \varepsilon_{it}\right] = \\ & = E\left[\Delta \left(\frac{IMM_i}{POP_i}\right)^{t-3} \left(\ln(P_{it}) - \beta \left(\frac{IMM_{it}}{POP_{it}}\right) - \delta \mathbf{W}_{it} - \mu_t - \varphi_i\right)\right] = 0 \end{aligned} \quad (17)$$

$t = 2, 3, \dots, T$

The final matrix of instruments has a block diagonal structure. The first block is composed from lagged endogenous variables and exogenous variables in levels. The second block is composed of the transformed lagged endogenous variables<sup>15</sup>. The validity of additional moment conditions used in the System GMM is testable through the difference Hansen test.

According to methodology proposed by (1992) to estimate the unknown parameters, the GMM estimator minimizes the following quadratic form:

$$\min_{\{\theta\}} g(\theta)' W(g) \quad (18)$$

where  $g(\theta)$  is the vector of orthogonality conditions,  $\theta$  is the vector of unknown parameters to be estimated and  $W$  is a positive definite weighting matrix (Hansen, 1982).

According to the GMM theory, it is best to use the two-step approach, i.e. to use as a weight the matrix obtained from the first step. However, the two-step approach also has shortcomings. If in the one-step GMM estimation the weighting matrix is independent of the estimated parameters, then in the two-step estimation it is based on the parameters estimated in the first step. Monte Carlo studies indicate that the asymptotic standard errors of the efficient two-step GMM estimator can be severely downward biased in small samples. However, the difference is possible to estimate, which makes the finite sample corrected estimates of the variance available. The corrected variance estimates approximate the finite sample variance well, leading to a more precise inference (Windmeijer, 2004).

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<sup>15</sup> For more details see Blundell and Bond (1998).

#### 4. Data Description

This section discusses the peculiarities of information used to evaluate the impact of immigration on the dynamics of housing prices in Italian provinces. Table 1 presents the descriptive statistics of the data used.

**Table1**  
**Descriptive statistics by provinces**

Variable	Population weighted		Non-weighted		Min	Max
	Mean	Std.dev.	Mean	Std.dev.		
Housing value (euro per sq. m)						
1996	1800.12	654.27	1666.90	670.07	640.99	4918.50
2007	2039.96	702.8	1855.29	646.78	823.46	4539.81
Number of residence permits issued						
1996	22,127	38,313	7,079	16,602	54	142,780
2007	57,945	77,454	23,446	36,681	942	257,779
Population	1,227,823	1,194,315	558,225	611,628	89,043	4,013,057
Immigrants concentration (permits/total population)						
1996	0.0128	0.0097	0.0104	0.0077	0.0003	0.0434
2007	0.0408	0.0231	0.0389	0.0222	0.0054	0.0981
GDP per capita	21,628	6,650	20,560	5,504	8500	37300
Unemployment rate (%)	8.04	5.8	7.48	5.52	0.7	29
Province area (sq.km)	3296	1769	2845	1600	212	7400

Notes: All variables are defined at the provincial level.

All variables except housing prices are defined at the annual level.

#### *Immigration*

To measure the stock of immigrants in Italy, I used the information provided by the National Statistical office (ISTAT)<sup>16</sup>. Since the early 1990s, ISTAT in collaboration with the Ministry of Internal Affairs, has developed statistics on foreign nationals legally present in Italy, based on the number of valid residence permits on 1 January of each year. The estimates are based on the information taken at least 6 months after the reference date. This allows us to take into account those foreign nationals whose permit of stay had expired by 1 January, but who had applied for a renewal, hence they were still legally present in Italy. Moreover, it also allows the inclusion of those foreign nationals who did not have residence permit due to long practice of the first release but had their legal status as well. The information has been available on an annual basis since 1992 with a detailed description of demographic characteristics: gender, age, marital status, country of origin and reason for presence in Italy.

<sup>16</sup> ISTAT-“The Italian National Institute of Statistics is a public research organization. It has been operating since 1926, and is the main producer of official statistics in the service of citizens and policy-makers. It is completely independent and is in continuous interaction with the academic and scientific communities.”



The changing number of Italian provinces over time requires some additional treatment of the initial information. Due to the creation of four new provinces (Olbia-Tempio, Ogliastra, Medio Campidano and Carbonia-Iglesias) in Sardinia, the number of Italian provinces has grown from 103 to 107. However, the estimates of the average housing values are available in the “103 provinces” format. Hence, to be consistent with the geographic units available for housing values, I adjusted the data on immigrants to the “103 provinces” format<sup>17</sup>.

### ***Population***

The information on total population in Italian provinces comes from the *Demographic balance of yearly resident population* and is available on an annual basis. The estimates are based on the monthly data collection *Movement and calculation of resident population*, which is implemented by ISTAT in collaboration with the Population Register offices (anagrafi) of Italian municipalities (comuni). **Resident population encompasses** both Italian and foreign citizens usually living within the national territory even if temporarily absent. According to Italian legislation, each person has to be registered in the population register of the municipality where he/she usually lives. Here as well, I adjusted the population data for Italian provinces to the “103 provinces” format using the technique applied to information on immigrants.

### ***Housing Price***

The information on housing values comes from the Italian Survey on Household Income and Wealth (SHIW)<sup>18</sup>. The most recent surveys encompass about 8,000 households (24,000 individuals), distributed over about 300 Italian municipalities. The respondents were asked to answer the following question during the interviews:

“In your opinion, what price could you ask for the dwelling in which you live (unoccupied). In other words, how much is it worth (including any cellar, garage or attic)? Please, give your best estimate”.

It is worth mentioning the disadvantages of the data. First, the housing values are self-reported by the house owner or the person who occupies it. However, the respondent is not always aware of the current market price of the dwelling. Second, the number of observations is around 8000, while the number of Italian provinces is equal to 103. Hence, the number of observations *per* province is around 80, which might be not sufficient for obtaining precise estimates for current market price of residential units<sup>19</sup>.

### ***Gross Domestic Product and Unemployment Rate***

The information on Gross Domestic Product comes from Regional Statistics provided by Eurostat Statistical office of European Communities<sup>20</sup>. The European System of Accounts in collaboration with

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<sup>17</sup> I added the number of immigrants reported for new provinces to the provinces, which they geographically belonged to before separation. The number of immigrants reported for Olbia-Tempio was added to the one reported for Sassari and reported as Sassari, Ogliastra was added to Nuoro and reported as Nuoro, Medio Campidano together with Carbonia-Iglesias were added to Cagliari and reported as Cagliari.

<sup>18</sup> SHIW - began in the 1960s with the aim of gathering data on the incomes and savings of Italian households. Over the years, the scope of the survey has grown and now includes wealth and other aspects of households' economic and financial behavior.

<sup>19</sup> The number of observations *per* province varies from five to more than five hundred.

<sup>20</sup> Eurostat is the statistical office of the European Union situated in Luxembourg. Its task is to provide the European Union with statistics at the European level that enables comparisons between countries and regions.

the National Statistical Institute calculates regional statistics estimates at different NUTS levels<sup>21</sup>. In this study, the provincial GDP *per capita* in Euros (EUR\_HAB) and in Purchasing Power Standards are used (PPS\_HAB). Italian provinces correspond to the NUTS3 level regional breakdown. The information is available for 107 Italian provinces and for the fore-mentioned reasons, the data was adjusted to the “103 provinces” format<sup>22</sup>.

The data on unemployment come from Eurostat as well. It is based on the LFS (Quarterly Labor Force Survey, “age 25 and over” is considered) and is available at the NUTS3 geographic disaggregation level. The variable used in this study is a result of the combination of the two datasets. The first dataset is the Regional labor market data based on the pre-2003 methodology (LFS adjusted series) and covers the period from 1995 to 2001. The second dataset comes from Regional unemployment LFS series and covers the period from 1999 to 2008. Due to the methodological changes there is some discrepancy once the overlapping period from 1999 to 2001 is compared; this makes these two datasets impossible to compare in “raw” terms. To fix this problem, I took the data from Regional unemployment LFS series, which covers the period from 1999 to 2008 as a benchmark and adjusted the remaining period (from 1995 to 1998) to the recent methodology<sup>23</sup>. Similar to GDP estimates, the provincial unemployment is presented in the “107 provinces” format beginning from 2001. I also adjusted the unemployment data to “103 provinces”<sup>24</sup>.

## 5. Results

This section is dedicated to the results obtained. First, the First difference and Instrumental variable estimation results are discussed and then those from the Difference and System GMM.

### 5.1 First Difference Estimation Results

Table 1 in the Appendix reports the results of the first difference and Instrumental variable estimations for the first specification. The results presented in column (1) show that without the inclusion of additional controls, the growth of immigrant population is positively and statistically significantly associated with the growth in housing prices. This makes sense, because an increase in population due to the inflow of immigrants leads to an increase in the demand for housing units, which, in turn, pushes housing prices up. The inclusion of log native population is essential, because it captures the effect of changes in prices due to the changes in native population. In this way, it is possible to

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<sup>21</sup> NUTS classification is a single, coherent system for dividing the EU's territory in order to produce regional statistics for the European Community. [http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts\\_nomenclature](http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature).

<sup>22</sup> The problem is related to Sardinia's provinces. The data at the NUTS3 geographic disaggregation level is available from 2001 provided in the “107 format”. To bring the data to the “103 format”, several steps were performed. First, to obtain the GDP data of the “old” provinces I weighed them by population of the “new” ones. This was done for the years from 2001 to 2006. Second, I tried to fill the missing values of GDP for the Sardinian provinces from 1995 to 1999 in the following way. I calculated the average ratio of the GDP of the Sardinian province  $i$  to the regional GDP for the period when data is available (from 2001 until 2006). The obtained ratio was used to calculate the GDP for four “old” provinces for the years from 1995 until 1999. Particularly, to obtain the GDP estimate for year  $t$ , the above-mentioned ratio was multiplied by the regional data of year  $t$ .

<sup>23</sup> I used the data for overlapping years to calculate the average ratio of “new” to “old” unemployment rates for every province. Then the “old” values (for the period beginning from 1995 to 1998) were multiplied by already calculated average ratios to obtain “new” values for the fore-mentioned period.

<sup>24</sup> To bring the data to the “103 format”, I used the population of “new” ones as weights. In the next step, I filled the missing values of Unemployment for Sardinian provinces from 1995 to 1999 in the following way. I have the unemployment rate for all eight Sardinian provinces for only 2008 and regional data for all years. I brought the 2008 data to the “103 format” and calculated the ratio of provincial to regional data for all “old” provinces. After that, I calculated the estimated provincial unemployment rate for Sardinian provinces multiplying the above-mentioned ratio by the regional data of the corresponding year.

separate the effect of migrants' inflow from the one generated by the inflow of natives. Column (2) reports the results of the basic specification with the set of time dummies that are supposed to capture the national trends in inflation and other economic variables. Although adding time dummies decreases the magnitude of  $\beta$  and makes it statistically insignificant, it notably improves the explanatory power of the model:  $R^2$  increases from 0.03 to 0.60. Column (3) reports the results of the estimation with the inclusion of controls for changes in economic conditions at the provincial level such as the unemployment rate and log GDP *per capita*. The later ones are supposed to capture the differences in housing prices due to the differences in economic conditions between provinces. The coefficient of the log number of immigrants is equal 0.054, which is significant only at the 10 per cent level. The results are robust to the inclusion of geographic area specific time dummies, which allow controlling for the differences in business cycles across Italian geographic areas; column (3) and (5) report very similar coefficients at the number of immigrants. The results suggest that a 10 per cent increase in the number of immigrants is associated with a 0.5-0.6 per cent increase in housing prices in the province, which indicates a quite modest effect of immigration on the average housing prices in Italian provinces. However, the effect of immigration on housing prices might have a non-linear pattern. The suspicion originates from the patterns captured in the Italian labor market. Particularly, as it was already mentioned in Section (2), the economic studies document a non-linearity in the response of Italian labor market to the presence of immigrants (Gavosto, Venturini and Vilossio, 1999; Venturini, 2003; Venturini and Vilossio, 2002). The pattern captured in the labor market might be reflected in the local housing markets as well. Particularly, natives may prefer to move from or not to settle in provinces where there is a concentration of immigrants. Columns (4) and (6) report the results of estimations with the inclusion of the squared term of log number of immigrants. The presented results confirm the initial suspicion upon the nonlinearity of response. The coefficient at immigration increases drastically and becomes statistically more significant. For example, the coefficient reported in column (4) increases to 0.394 and becomes statistically significant at the 1 per cent level compared to 0.054 significant only at the 10 per cent level in column (3). In column (4) and (6), the coefficients at the squared term of log number of immigrants are negative and statistically significant at 5 and 10 per cent respectively. Once the squared term of log number of immigrants is included, the number of immigrants has no longer a positive effect on housing prices in provinces: the relation between log housing prices and log number of immigrants turns negative once the log number of immigrants reaches 8.47. This value corresponds to approximately 4,770 immigrants in a province. The obtained results indicate that the initial model without the inclusion of the squared term might overlook some potentially important non-linearities.

Table 2 in the Appendix presents the results of the first difference estimations obtained for the second specification, where the concentration of immigrants is used to measure the presence of immigrants in provinces. Column (1) presents the first difference estimation without additional controls. As in the previous case, the coefficients at immigrants' concentration are positive and statistically significant. Obviously, without other controls the explanatory power of the model is very low. Columns (2) and (3) show that the inclusion of the time dummies and macroeconomic controls significantly increases the explanatory power of the model. However, the coefficients at the concentration of immigrants becomes negative and statistically insignificant. Column (5) shows that the addition of geographic areas specific time dummies does not change the results. The results presented in Columns (4) and (6) show that in this case, the nonlinearity in the response of housing price to the presence of immigrants is confirmed. The inclusion of the squared term of immigrants' concentration makes the coefficient of main interest positive and statistically significant at the 10 per cent level. Moreover, the coefficient at the squared term of immigrants' concentration is negative and statistically highly significant. These results indicate the average housing prices in Italian provinces are positively associated with the concentration of immigrants only until it reaches a threshold. The effect turns negative once the concentration reaches a critical level. The critical value of immigrant concentration is estimated close to 3 percent, after which the relationship turns its direction

Columns (7) and (8) in Tables 1 and 2 report the results of the Instrumental variable estimation. As it has been already discussed in Section (3), to deal with the potential endogeneity issues the conventional approach is applied: the historic information of immigrants' settlement pattern is used to instrument current stock of immigrants. The Instrumental variable estimations do not confirm the first difference estimation results: in all four cases the results are statistically not significant. Having only one instrument for the potentially endogenous variable allows only exact identification. Unfortunately, it also excludes the possibility of performing the overidentification test, which could help to evaluate the validity of the instrument.

## **5.2 Difference GMM and System GMM Estimations Results**

The results presented in the previous subsection might be biased due to the endogeneity issues presented in Section (4). To verify their validity the Difference and System GMM procedures are applied. Table 3 and Table 4 in the Appendix summarize the results of, respectively, the first and the second specifications.

Columns (1) and (2) in Table 3 present the results of the Difference GMM one-step estimations with and without the inclusion of the squared term of log number of immigrants. Although the coefficients follow the pattern captured in the first difference estimations, none of them are statistically significant. According to the GMM theory, it is optimal to perform the so-called two-step procedure; i.e. to use it as the weight matrix obtained from the first step. The results of the two-step Difference GMM estimation are presented in columns (3) and (4). The obtained coefficients are larger in magnitude but still statistically insignificant. As it has been already discussed in Section (3), the GMM Difference estimation may suffer from the "weak instrument" problem. To deal with it, the System GMM estimations are performed; the results of the one-step and two-step estimations are reported in columns (5)-(6) and (7)-(8) respectively. The results of the one-step procedure reported in column (5) provide with positive and a slightly larger coefficient at the log number of immigrants compared to ones obtained by the first difference estimation. The inclusion of the squared term in the estimation confirms the nonlinearity of the response; however, the coefficient at the squared term is statistically significant only at the 10 per cent level. The obtained results suggest that the direction of the effect changes from positive to negative when the number of immigrants in an average province reaches approximately four 4,000. Still, the two-step procedure does not confirm the nonlinearity and suggests a constant elasticity of the average housing prices with respect to the number of immigrants. The coefficient at the log number of immigrants is again slightly larger than the one obtained in by the first difference estimation and suggests that a 10 per cent increase in the stock of immigrants is associated with an 0.8 per cent increase in the average housing prices. This finding is consistent with the expected positive correlation between stock of immigrants and unobserved province specific characteristics that could bias the first difference estimation towards zero. In all cases where the two-step procedure is applied the reported standard errors are Windmeijer corrected.

Table 4 reports the results of the specification considering the concentration of immigrants as the main dependent variable. The structure of the table is similar to the one in Table 3. All standard errors in the two-step estimations are reported with the Windmeijer correction. In all cases, the non-linearity in the response of the average housing prices to immigrants' concentration is confirmed; the obtained coefficients at the concentration of immigrants are positive and negative at its squared term. The only exception is the Difference GMM two-step estimation, where the coefficient at the concentration of immigrants is not statistically significant, however, the one at the squared term is statistically significant. The critical point of immigrants' concentration after which the initial positive effect changes to negative is estimated around 5-6 per cent, which is larger or "further" than the one estimated by the first difference technique.

The consistency of the obtained results depends on the validity of the assumptions: the validity of instruments and absence of serial correlation in the error term. Particularly, both Sargan and Hansen

tests confirm the joint validity of the instruments employed. The only case when the Sargan test rejects the null hypothesis is the System GMM estimation. Still, if a non-sphericity in error terms is suspected, then the Sargan statistics are not consistent and the Hansen overidentification test is theoretically superior (Roodman, 2006). Hence, for all two-step estimations, along with the Sargan test, the tables report the Hansen test results as well; Hansen test does not reject the null hypothesis of overidentification. To test the autocorrelation in the error term, the Arellano-Bond test is performed; the results are reported in the lower part of Table 3 and Table 4. The System GMM two-step is the preferred specification for the reasons discussed in Section (3): “weak instrument” problem and the superiority of the two-step procedure over the one-step one. Here as well, the Difference Sargan test does not reject the null hypothesis of validity of the additional moment conditions. The Arellano-Bond test shows a first-order serial correlation in the error term, which, however, does not undermine the reliability of the obtained results<sup>25</sup>. The set of instruments used for estimation includes lags from the third to the fifth one. Hence, it is crucial not to have second-order serial correlation in error term. The Arellano-Bond test does not detect second-order serial correlation in any of the specifications.

## 6. Conclusion

A growing body of economic literature analyzes the impact of immigration on host economies. With few exceptions, this literature mainly addresses the issues related to the labor market outcomes or costs and benefits imposed on native taxpayers due to the inflow of immigrants. However, the purpose of economic studies is the investigation of economic processes for precise policy design. Hence, the final judgment can be made only after careful consideration of a wider range of factors and channels through which immigration can influence the well being of the population. An enriched picture of immigrants’ influence on the well being of natives can be obtained if the effect immigrants have on the production process, through altering composition of labor force and the impact on local prices through consumption process, is taken into account as well. Consideration of the price effect can enhance our understanding of the influence on the real income and the real wealth of population. In this respect, housing markets through changes in rents and prices, may represent one of the main non-labor channels, by which immigrants influence the well being of natives.

This study examines the impact of immigration flows on the local housing prices in Italy from 1996 to 2007. The paper contributes to the existing literature on immigration in the following ways: first, the Italian housing market has never been considered in connection with immigration flows. This study enhances the understanding of the influence that recent intensive immigration has had on the Italian economy by estimating its impact on the dynamics of housing values. Second, the attempts to estimate the influence of immigrants on the housing market outcome have been made mostly for the USA. With the exception of Gonzales and Ortega (2013), the influence of immigrants on the European housing markets remains unexplored by economists. This study examines the impact of immigration in Italy and enhances our understanding of the impact that immigration has on the European housing market. This fact makes this study remarkable in a wider context; i.e. it motivates the investigation of the influence of immigration on housing markets in European regions in the future. Third, it contributes to the recently emerging branch of literature on the influence of immigration on prices in general. Finally, it exploits a different methodologically approach with respect to the existing literature in this field. Particularly, given the potential endogeneity of immigration, its lagged values are proposed as instrumental variables, the validity of which is discussed throughout the paper. Particularly, the Difference and System GMM techniques are used to tackle the concerns associated with the reliability of estimates obtained by the First Difference estimation.

The First Difference estimation results show that immigration has positive, however, declining effect on the growth of housing prices in Italian provinces. The estimated results suggest that, *ceteris*

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<sup>25</sup> To check for first-order serial correlation, one should look for second-order correlation in differences.

*paribus*, as the growth of immigrants' concentration in province reaches approximately 3 percent, its further increase leads to a decrease in the rate of housing price appreciation. The GMM estimates confirms the non-linearity, however, and suggests a higher critical point: it is estimated around 5-6 percent. Both the First Difference and the GMM results suggest a positive association between increase in immigrant population and housing prices; the magnitude of the response is modest, however, statistically significant. Particularly, the First Difference estimates suggests that a 10 per cent increase in immigrant population leads to a 0.6 per cent increase in the average housing prices in Italian provinces. The results of GMM System suggest that it is equal to 0.87 per cent.

It is necessary to take into account that the estimation is performed using self-reported survey based data. Hence, the results should be interpreted with caution. However, these results suggest the direction for future research. For example, taking into account the fact that immigrants differ from natives in a number of dimensions (such as family composition and income, etc.) they may look for housing units with particular characteristics. Hence, a study may be more informative once the focus is immigrants' influence on different segments of local housing markets. Another direction for improvement is using market based information on housing prices or rents.

## References

- Arellano, M., and S. Bond (1991). "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies* Vol. 58, 277-97.
- Arellano, M., and O. Bover (1995). "Another Look at the Instrumental Variables Estimation of Error Components Models." *Journal of Econometrics*, Vol. 68, 29-51.
- Baum C.F., Schaffer M.E. and S. Stillman (2007). "Enhanced Routines for Instrumental Variables/GMM Estimation and Testing." *Stata Journal* 7(4), *Boston College Economics working paper* No 667.
- Bianchi, M., Bounanno, M., and P. Pinotti (2008), "Immigration and Crime: an Empirical Analysis." *Temi di discussione, Banca d'Italia* , No 698.
- Blundell, R., and S. Bond (1998). "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models." *Journal of Econometrics*, Vol. 87, 11-143.
- Brandolini, A., Cannari, L., D'Alessio, G. and I. Faiella (2004). "Household Wealth Distribution in Italy." *Banca d'Italia, Temi di discussione*, No 530.
- Brucker, H. and E. J. Jahn (2008). "Migration and the Wage Curve: a Structural Approach to Measure the Wage and Employment Effects of Migration." Institute for the Study of Labor, IZA Discussion Paper No 3423.
- Bruelcher, H. S. Fachin , A.Venturini (2011), "Do Foreigners Replace Natives Immigrants? Evidence from a Panel Cointegration Analysis", *Economic Modeling*, Vol. 28(3), pages 1078-1089.
- Burnley, I., Murphy, P., and R. Fagan (1997). "Immigration and Australian Cities." *The Federation Press* .
- Cannari, L., Faiella, I., Grazia, M. and A. Neri (2008). "The Real Assets of Italian Households." in Household wealth in Italy. *Papers are presented at the conference held in Perugia, 16-17 October 2007*.
- Cannari, L., Sestito, P. and F. Nucci (2000). "Geographic Labour Mobility and the Cost of Housing: Evidence from Italy." *Applied Economics*, Vol. 32 (14), 1899-1906.
- Card, D. (2001). "Immigrant Inflows, Native Outflows, and the Local Labor Market Impacts of Higher Immigration." *Journal of Labor Economics*, 19(1), 22-64.
- Card, D. (2005). "Is the New Immigration Really So Bad?" *Economic Journal*, 115, 300–323.
- Card, D. (2007). "How Immigration Affects U.S. Cities." *Center for Research and Analysis of Migration*, CReAM Discussion Paper No 11/07.
- Card, D. and J.E. Di Nardo (2000). "Do Immigrants Inflow Leads to Native Outflows?" *The American Economic Review*, Vol. 90 (2), 360-367.
- Carrington, W.J., Detriagiache, E. and T. Vishwanath (1996). "Migration with Endogenous Moving Costs." *American Economic Review*, 86(4), 909-930.
- Chaloff, J. and G. Lemaitre (2009). "Managing Highly-skilled Labour Migration: a Comparative Analysis of Migration Policies and Challenges in OECD countries." *OECD social , employment and migration working papers*, No 79.
- Clark, K. and S. Drinkwater (2008). "The Labour-market Performance of Recent Migrants." *Oxford Review of Economic Policy*, Vol. 24(3), 495–516.
- Cortes, P. (2008). "The Effect of Low-skilled Immigration on U.S. Prices: Evidence from CPI Data." *Journal of Political Economy*, 381-422.

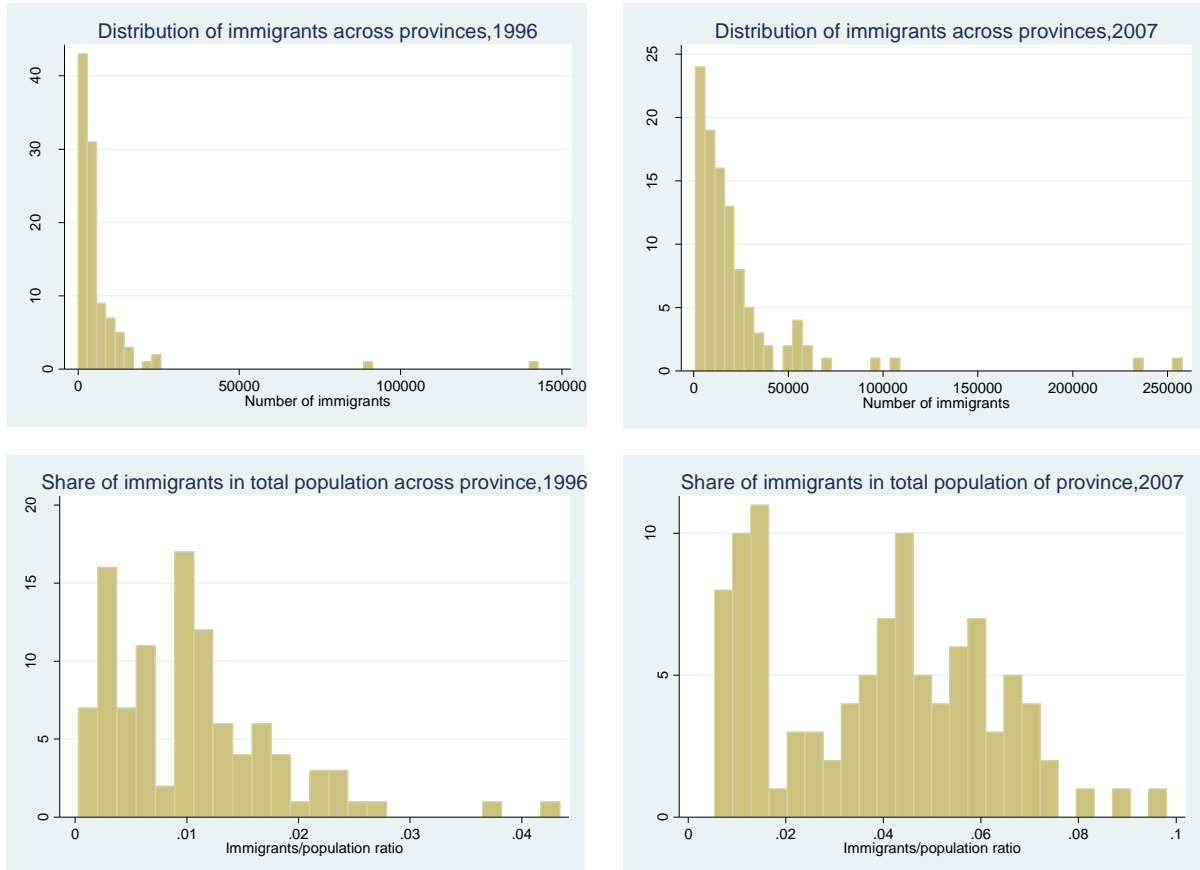
- Davies, J.B. and A. F. Shorrocks (2000). "The Distribution of Wealth." Chapter 11 in A.B. Atkinson and F.Bourguignon, Editor(s), *Handbook of Income Distribution*, Elsevier, 2000, Vol. 1, 605-675,
- Del Boca, D. and A.Venturini, (2003). "Italian Migration." Institute for the Study of Labor, IZA Discussion Paper No 938.
- Di Addario, S. (2002). "Italian Household Tenure Choices and Housing Demand." *Banca d'Italia, Mimeo*.
- Dustmann, C., Glitz, A. and T. Frattini (2008). "The Labour Market Impact of Immigration." *Oxford Review of Economic Policy* 24(3), 477-494.
- Faiella, I. and A. Neri (2004). "La Ricchezza delle Famiglie Italiane e Americane." *Banca d'Italia, Temi di discussione*, No 501.
- Federman, M.N., Harrington, D.E. and K.J. Krynski (2006). "Vietnamese Manicurists: Displacing Natives or Finding New Nails to Polish?" *Industrial and Labor Relations Review* 59, 302–18.
- Filer, R.K. (1992). "Immigrant Arrivals and the Migratory Patterns of Native Workers." in G. J. Borjas and R.B. Freeman (Eds.), *Immigration and the Workforce*, The University of Chicago Press, Chicago.
- Frattini, T. (2008). "Immigration and Prices in the UK." Job Market Paper.
- Gavosto, A., Venturini, A. and C. Villosio (1999). "Do Immigrants Compete with Natives?" *LABOUR*, 13 (3), 603-622.
- Gonzalez, L.and F.Ortega (2013). "Immigration and Housing Booms: Evidence from Spain." *Journal of Regional Science*, Vol. 53(1), 37–59.
- Greulich, E., Quigley, J. M. and R. Steven, (2005). "The Anatomy of Rent Burdens: Immigration, Growth and Rental Housing." *UC Berkeley: Berkeley Program on Housing and Urban Policy*.
- Hansen L.P. (1982). "Large Sample Properties of Generalized Method of Moments Estimators." *Econometrica* 50, 1029–1054
- Kovacheva, V. and D. Vogel (2009). "The Size of the Irregular Foreign Resident Population in the European Union in 2002, 2005 and 2008: Aggregated estimates." Hamburg Institute of International Economics. *Database on Irregular Migration*, Working Paper No 4/2009.
- Lach, S. (2007). "Immigration and Prices." *Journal of Political Economy*, Vol. 115(4).
- Lewis, E. (2004). "How did the Miami Labor Market Absorb the Mariel Immigrants?" *Federal Reserve, Bank of Philadelphia*, Working Paper No 04-3.
- Ley, D. and J. Tuchener (2001). "Immigration and Metropolitan House Prices in Canada." *Research on immigration and integration*. Housing Studies, Vol. 16 (2).
- Malpezzi, S. (1996). "Housing Prices, Externalities, and Regulation in U.S. Metropolitan Areas." *Journal of Housing Research* 7 (2), 209–41.
- Manacorda, M., Manning, A. and J. Wadsworth (2012). "The Impact of Immigration on the Structure of Male Wages: Theory and Evidence from Britain." *Journal of the European Economic Association*, Vol. 10(1) , 120–151.
- McKenzie, D. and H. Rapoport (2010). "Self-selection Patterns in Mexico-U.S. Migration: The role of migration networks" *Review of Economics and Statistics*, Vol. 92 (4), 811-821.
- Muller, T and T.J. Espenshade. (1985). "The Fourth Wave: California's Newest Immigrants". *The Urban Institute Press*.



- Ohls, J. (1975). "Public Policy towards Low Income Housing and Filtering in Housing Markets", *Journal of Urban Economics*, 2, 144–71.
- Ottaviano, G.I. and G. Peri (2012). "Rethinking the Effect of Immigration on Wages", *Journal of the European Economic Association*, Vol. 10(1), 152–197.
- Ottaviano, G. I. and Peri, G. (2007). "The Effects of Immigration on U.S. Wages and Rents: A General Equilibrium Approach", *Center for Research and Analysis of Migration*, CReAM Discussion Paper No 13/07.
- Paiella, M. (2001). "Demand for Housing, Saving Behavior and Wealth Allocation." *Banca d'Italia*.
- Pedersen J.P., Pytlikova, M. and N. Smith (2008). "Selection and network effects—Migration flows into OECD countries 1990–2000." *European Economic Review*, Vol. 52, 1160–1186.
- Poot, J. and W. Cochrane (2005). "Measuring the Economic Impact of Immigration: A Scoping Paper." *Hamilton, New Zealand: University of Waikato, Population Studies Centre*, Discussion Paper No 48.
- Roodman, D. (2006). "How to Do xtabond2: An Introduction to "Difference" and "System" GMM in Stata", *Center for Global Development*, Working Paper No 103.
- Saiz, A. (2003), "Room in the Kitchen for the Melting pot: Immigration and Rental Prices." *Review of Economics and Statistics*, 85 (3), 502–521.
- Saiz, A. (2007). "Immigration and Housing Rents in American Cities" *Journal of Urban Economics* 6 , 345–371.
- Stillman, S. and C. D. Maré (2008). "Housing Markets and Migration: Evidence from New Zealand." *Motu Economic and Public Policy Research*, Working Paper No 08-06.
- Susin, S. (2001), "The Impact of the Mariel Boatlift on the Miami Housing Market." *U. S. Census Bureau*.
- Sutton, G.D. (2002). "Explaining Changes in House Prices." *BIS Quarterly Review*, September, 46-55.
- Venturini, A. and C. Villosio (2002). "Are Immigrants Competing with Natives in the Italian Labour Market? The Employment Effect", *Institute for the Study of Labor, IZA*, Discussion Paper No 467.
- Venturini A. and C. Villosio (2008). "Labour-market Assimilation of Foreign Workers in Italy." *Oxford Review of Economic Policy*, Vol. 24(3), 517–541.
- Venturini A. and C. Villosio (2006). "Labour Market Effects of Immigration into Italy: An Empirical Analysis", *International Labour Review*, Vol. 145 (1-2) , 91-118.
- Windmeijer F (2005), "A Finite Sample Correction for the Variance of Linear Efficient Two-step GMM Estimators." *Journal of Econometrics* 126, 25–51.
- Wooldridge, J. (2002), "Econometric Analysis of Cross Sectional and Panel Data." *The MIT Press, Cambridge*.

Appendix

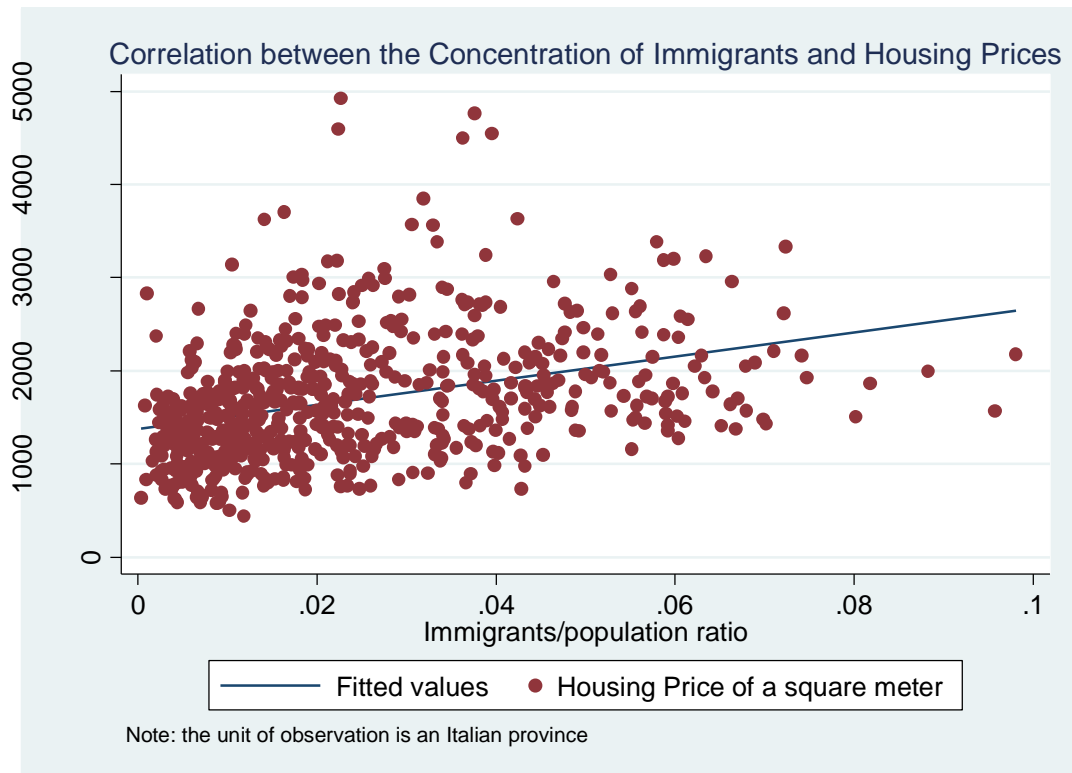
**Figure1**  
**Distribution of Immigrants Across Italian Provinces**



*Note;* This figure presents the evolution of the distribution of immigrants across Italian provinces during the period from 1996 to 2007. The number of immigrants is equal to the number of valid residence permits issued by the Ministry of Internal Affairs at the beginning of a calendar year. The share of immigrants in total population in provinces is measured as the ratio of number of valid residence permits over total population at the beginning of a calendar year.

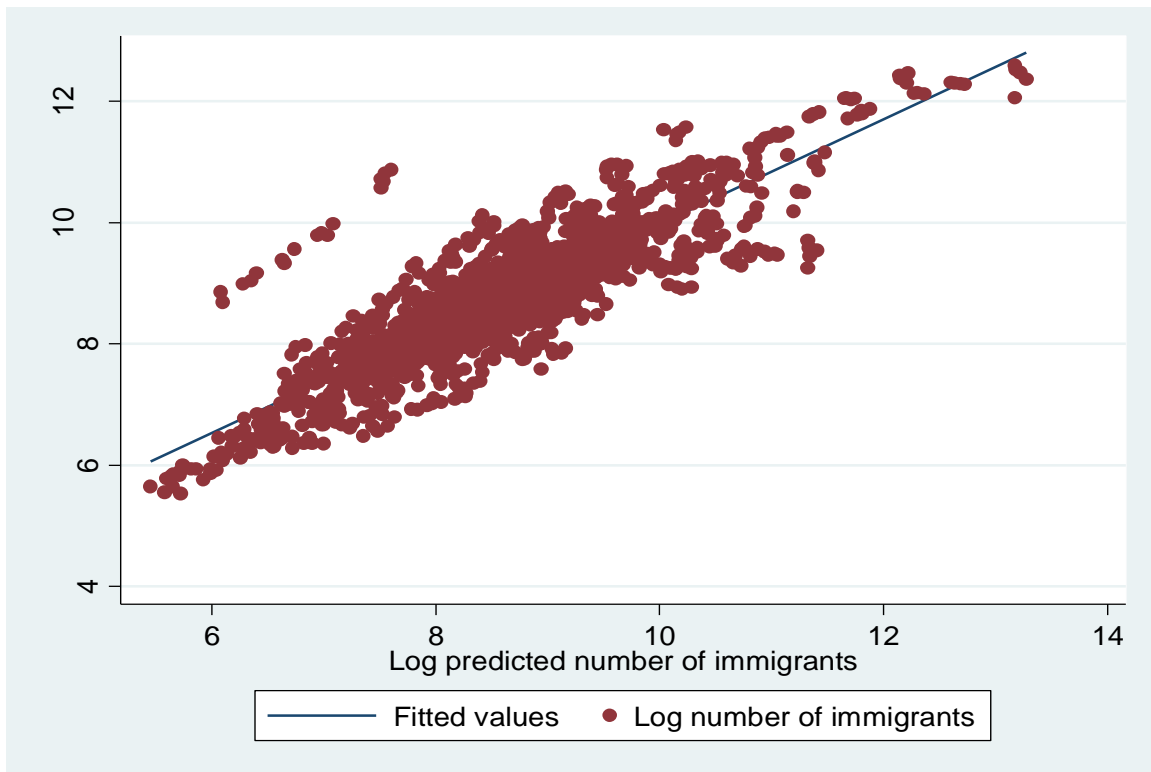
Source: ISTAT.

**Figure 2**  
**Concentration of immigrants vs. Housing prices**



*Note:* This graph presents correlation between the concentration of immigrants and housing prices per square meter. The horizontal axis is the share of immigrants in total population in provinces measured as ratio of number of valid residence permits over total population at the beginning of a calendar year. The vertical axis is the average housing price per square meter in Italian provinces at the beginning of a calendar year.

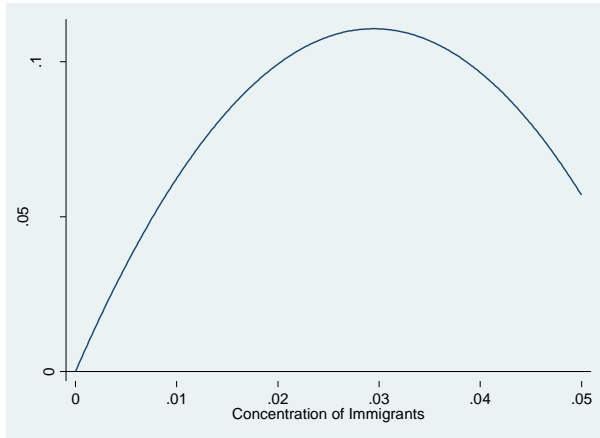
**Figure 3**  
**Actual vs. Predicted number of immigrants**



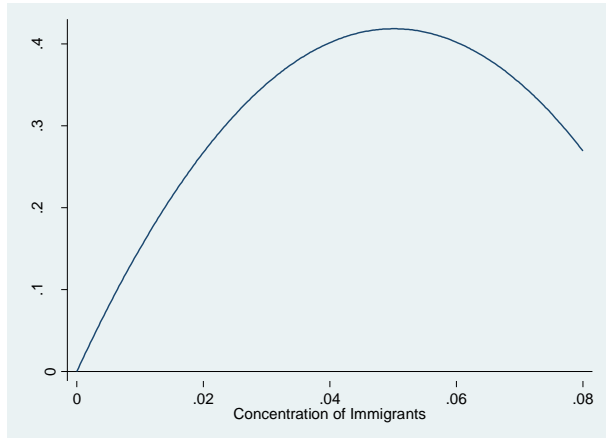
*Note:* This graph presents the correlation between the log actual number of immigrants and predicted number of immigrants in Italian provinces. The vertical axis is the log number of immigrants measured as the number of valid residence permits at the beginning of calendar year. The horizontal axis is log predicted number of immigrants based on the initial settlement pattern of immigrants by country of origin.

**Figure 4**  
**The Relationship between Housing Prices and the Concentration of Immigrants**

Based on the First Difference estimation results



Based on the System GMM estimation results



*Note:* This graph presents the relation between the concentration of immigrants and housing prices per square meter. The horizontal axis is the share of immigrants in total population in provinces measured as ratio of number of valid residence permits over total population at the beginning of a calendar year. The vertical axis is log average housing price per square meter in Italian provinces at the beginning of a calendar year

**Table 1**  
**First Difference and Instrumental Variable Estimation Results**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Ln</i> (Number of Immigrants)	0.213*** (0.062)	0.051 (0.032)	0.054* (0.032)	0.398*** (0.154)	0.060* (0.034)	0.373** (0.180)	0.254 (0.243)	0.074 (0.542)
<i>Ln</i> (Number of Immigrants) <sup>2</sup>				-0.024** (0.011)		-0.022* (0.013)		(0.036)
<i>Ln</i> (Native)	0.333 (1.044)	0.472 (0.662)	0.580 (0.725)	0.808 (0.755)	0.600 (0.717)	0.659 (0.728)	0.723 (0.755)	0.682 (0.7340)
Unemployment rate			0.008 (0.006)	0.010* (0.006)	0.008 (0.006)	0.009 (0.006)	(0.007)	0.013* (0.007)
<i>Ln</i> (GDP ppp/per capita)			0.468 (0.398)	0.546 (0.393)	0.407 (0.408)	0.435 (0.407)	(0.444)	0.276 (0.470)
Number of obs.	595	595	500	500	500	500	461	461
Number of prov.	103	103	103	103	103	103	95	95
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area specific time dummy	No	No	No	No	Yes	Yes	Yes	Yes
R-squared	0.03	0.59	0.61	0.62	0.63	0.63	0.60	0.60

*Notes:* The table presents results of the First Difference and IV estimations on a panel of biennial observations for 103 Italian provinces during the period 1996-2007. The biennial log-change of average housing prices in provinces is the dependent variable. The log change of number of immigrants (i.e. residence permits) is the main explanatory variable of interest. Housing prices data are from 1996, 1999, 2001, 2003, 2005, 2007 and covers 103 Italian provinces. Regression also controls for biennial changes in log population, log income, unemployment rates. The robust standard errors are presented in parenthesis.

\*\*\*Significant at the 1 per cent level.

\*\* Significant at the 5 per cent level.

\* Significant at the 10 per cent level.

**Table 2**  
**First Difference and Instrumental Variable Estimation Results**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Concent. of immigrants	12.271*** (2.271)	-2.604 (2.263)	-3.391 (2.263)	7.789* (4.228)	-3.361 (2.668)	7.513*** (4.086)	10.859 (29.276)	-12.419 (14.981)
Concent. of immigrants <sup>2</sup>				-127.372*** (40.973)		-127.469*** (40.636)		133.811 (196.660)
Unemployment			0.010* (0.006)	0.011* (0.005)	0.009 (0.006)	0.009 (0.006)	(0.009)	0.012 (0.007)
lnGDP(pps/per cap)			0.437 (0.395)	0.391 (0.396)	0.410 (0.404)	0.325 (0.408)	(0.538)	0.303 (0.424)
Number of obs.	595	595	500	500	500	500	461	461
Number of prov.	103	103	103	103	103	103	95	95
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Area specific time dummy	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Geographic area time dummies	No	No	No	No	Yes	Yes	Yes	Yes
R-squared	0.04	0.60	0.61	0.62	0.63	0.63	0.60	0.60

*Notes:* The table presents results of the First Difference and IV estimations on a panel of biennial observations for 103 Italian provinces for the period 1996-2007. The biennial log-change of the average housing prices in provinces is the dependent variable. The change in the concentration of immigrants (i.e. number of valid residence permits over total population) is the main explanatory variable of interest. Housing prices data are from 1996, 1999, 2001, 2003, 2005, 2007 and cover 103 Italian provinces. Regression also controls for biennial changes in log income, unemployment rates. The robust standard errors are presented in parenthesis

\*\*\*Significant at the 1 per cent level.

\*\* Significant at the 5 per cent level.

\* Significant at the 10 per cent level

**Table 3**  
**Difference GMM and System GMM estimations results**

	Difference GMM				System GMM			
	One Step		Two Step		One Step		Two Step	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>ln</i> (Immigrants)	0.040 (0.035)	0.146 (0.308)	0.068 (0.057)	0.207 (0.271)	0.069** (0.034)	0.265** (0.119)	0.087* (0.047)	0.276 (0.226)
<i>ln</i> (Immigrants) <sup>2</sup>		-0.008 (0.024)		-0.014 (0.022)		-0.016* (0.008)		-0.018 (0.016)
<i>ln</i> (Native)	-0.243 (0.550)	-0.093 (0.701)	-0.091 (0.505)	-0.016 (0.620)	-0.006 (0.038)	0.092* (0.052)	-0.003 (0.060)	0.114 -0.115
Unemployment rate	0.000 (0.005)	0.000 (0.005)	0.001 (0.006)	0.000 (0.008)	-0.002 (0.003)	-0.001 (0.003)	-0.004 (0.005)	-0.005 (0.008)
<i>ln</i> (GDP <i>per capita</i> )	0.476* (0.288)	0.510* (0.304)	0.405 (0.379)	0.430 (0.467)	0.434*** (0.095)	0.650*** (0.132)	0.400* (0.234)	0.737* (0.389)
Number of obs.	500	500	500	500	606	606	606	606
Number of prov.	103	103	103	103	103	103	103	103
Sargan	8.411 [0.676]	21.250 [0.505]	8.411 [0.676]	21.250 [0.505]	23.397 [0.104]	48.773 [0.029]	23.397 [0.104]	48.773 [0.029]
Hansen			8.316 [0.685]	20.983 [0.522]			11.365 [0.786]	34.474 [0.350]
M1 (AR(1))	-6.240 [0.000]	-6.163 [0.000]	-5.55 [0.000]	-5.414 [0.000]	-6.886 [0.000]	-6.698 [0.000]	-5.497 [0.000]	-5.377 [0.000]
M2 (AR(2))	-1.778 [0.075]	-1.751 [0.080]	-2.228 [0.026]	-2.101 [0.036]	-1.954 [0.051]	-1.940 [0.052]	-2.189 [0.029]	-2.07 [0.038]
M3 (AR(3))	0.759 [0.448]	0.724 [0.469]	1.031 [0.302]	0.823 [0.411]	0.931 [0.352]	0.823 [0.411]	1.156 [0.248]	0.909 [0.363]
Numb. of instrum.	12	24	12	24	17	34	17	34

Notes: The table presents results of the Difference and System GMM estimations on a panel of biennial observations for 103 Italian provinces during the period 1996-2007(housing prices data are from 1996, 1999, 2001, 2003, 2005, 2007). The biennial log average housing prices in provinces is the dependent variable. The log of number of immigrants (column (1)-(5)) and concentration of immigrants ((column (6)-(10)) are the main explanatory variables of interest. Regressions also control for biennial changes log income, unemployment rates and include time dummies. Standard errors are reported in round parenthesis. P-values are reported in square parenthesis.

\*\*\*Significant at the 1 per cent level.

\*\* Significant at the 5 per cent level.

\* Significant at the 10 per cent level



**Table 4**  
**Difference GMM and System GMM estimations results**

	Difference GMM				System GMM			
	One Step		Two Step		One Step		Two Step	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Concent. of imm.	4.570 (4.867)	12.697** (6.013)	5.779 (9.147)	14.370 (8.846)	-2.858** (1.374)	20.693*** (3.926)	-3.796 (2.931)	16.707** (7.961)
Concent. of imm.		-100.938** (50.242)		-121.910** (50.744)		-191.975*** (36.882)		-166.731** (68.299)
Unemployment rate	-0.001 (0.005)	-0.001 (0.005)	-0.001 (0.008)	0.003 (0.008)	0.004 (0.003)	0.005 (0.003)	0.001 (0.008)	0.006 (0.007)
ln (GDP per capita)	0.504* (0.289)	0.397 (0.293)	0.135 (0.418)	0.375 (0.321)	0.884*** (0.092)	0.465*** (0.099)	0.962*** (0.275)	0.662** (0.269)
Number of obs.	500	500	500	500	606	606	606	606
Number of prov.	103	103	103	103	103	103	103	103
Sargan	12.668 [0.316]	16.444 [0.793]	12.668 [0.316]	16.664 [0.825]	44.609 [0.000]	71.204 [0.000]	75.964 [0.000]	71.204 [0.000]
Hansen			12.883 [0.301]	14.454 [0.913]			23.207 [0.143]	27.258 [0.706]
M1 (AR(1))	-6.195 [0.000]	-6.195 [0.000]	-5.494 [0.000]	-5.446 [0.000]	-6.668 [0.000]	-11.921 [0.000]	-11.921 [0.000]	-5.306 [0.000]
M2 (AR(2))	-1.745 [0.081]	-1.716 [0.086]	-2.169 [0.030]	-2.057 [0.040]	-1.949 [0.051]	-4.017 [0.073]	-4.017 [0.026]	-1.958 [0.050]
M3 (AR(3))	0.827 [0.408]	0.791 [0.429]	1.100 [0.271]	0.968 [0.333]	0.591 [0.555]	0.678 [0.498]	0.730 [0.465]	0.797 [0.426]
Numb. of instrum.	12	24	12	24	17	34	17	34

Notes: The table presents results of Difference and System GMM estimations on a panel of biennial observations for 103 Italian provinces during the period 1996-2007 (housing prices data are from 1996, 1999, 2001, 2003, 2005, 2007). The biennial log average housing prices in provinces is the dependent variable. The log of number of immigrants (column (1)-(5)) and concentration of immigrants ((column (6)-(10)) are the main explanatory variables of interest. Regressions also control for biennial changes log income, unemployment rates and include time dummies. Standard errors are reported in round parenthesis. P-values are reported in square parenthesis.

\*\*\*Significant at the 1 per cent level.

\*\* Significant at the 5 per cent level.

\* Significant at the 10 per cent level

**Table 5**  
**The list of origin countries and their groups used to construct an instrument for the stock of immigration**

<i>Individual countries</i>	Albania, Algeria, Argentina, Australia, Bangladesh, Brasilia, China, Columbia, Cost D'Avour, Cuba, Dominican Republic, Ecuador, Egypt, Ethiopia, Philippines, Pakistan, Peru, Poland, Romania, Senegal, Somalia, Sri Lanka, USA, Switzerland, Tunis, Turkey, Canada, Ghana, Japan, Jordan, India, Iran, Lebanon, Morocco, Mauritius, Nigeria, Without citizenship
<i>Central Europe</i>	Bulgaria, Czech Republic, Slovakia, Hungary
<i>Europe (other)</i>	UK, San Marino, Spain, Sweden, Andorra, Austria, Belgium, Cyprus, Vatican, Denmark, Finland, France, Greece, Ireland, Island, Lichtenstein, Luxemburg, Malta, Monaco, Norway, The Netherlands, Portugal
<i>Former Soviet Union</i>	Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kirgizia, Lithuania, Latvia, Moldavia, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan
<i>Asia</i>	Afghanistan, Saudi Arabia, Bhutan, Northern Korea, Southern Korea, Laos, Syria, Yemen, Bahrain, Cambodia, Un. Arabic Emirates, Iraq, Israel, Kuwait, Mongolia, Myanmar, Nepal, Oman, Palestine, Qatar, Taiwan, Thailand, Vietnam
<i>America (South )</i>	Bolivia, Chile, Guyana, Nicaragua, Paraguay, Suriname, Uruguay
<i>America (Central )</i>	Antigua and Barbuda, Bahamas, Barbados, Belize, Costa Rica, Dominica, Salvador, Jamaica, Grenada, Haiti, Honduras, Mexico, Panama, Santa Lucia, Trinidad and Tobago, Venezuela, Guatemala
<i>Africa (North)</i>	Cameroon, Capo Verde, Central Africa, Chad, Eritrea, Gambia, Gibraltar, Djibouti, Guinea, Guinea Bissau, Equatorial Guinea, Kenya, Liberia, Libya, Madagascar, Mali, Mauritania, Nigeria, Ruanda, San Tome and Principe, Sierra Leone, Sudan, Togo, Uganda, Benin, Burkina Faso
<i>Africa (South)</i>	Angola, Botswana, Burundi, Comoro, Congo, Gabon, Lesotho, Malawi, Mozambique, Namibia, Democratic Republic of Congo, South Africa, Swaziland, Tanzania, Zaire, Zambia, Zimbabwe
<i>Australia and Oceania</i>	Brunei, Fiji, Indonesia, Kiribati, Malaysia, Maldives, Marshal, Micronesia, New Zealand, Palau, Papua New Guinea, San Vincent and Grenadine, San Christ and Nevis, Salomon, Samoa, Seychelles, Singapore, Timor, Kingdom of Tonga, Tuvalu, Vanuatu

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