Housing Market Responses to Immigration; Evidence from Italy

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Sona Kalantaryan

Abstract

This study empirically examines the impact of immigration on the dynamics of housing prices across Italian provinces from 1996 till 2007 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. The massive debate upon the impact of current intensive immigration flows on the well-being of the 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 housing market in Italy. Moreover, the study exploits different methodological approach with respect to one dominating in migration literature. The obtained results suggest that an increase in immigrant population leads to an increase in average housing prices. Instead, 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 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.

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[1]. This study considers an alternative channel through which immigrants can influence the wellbeing of the residing population. Particularly, it empirically examine the impact of immigration on the dynamics of housing prices across Italian provinces from 1996 till 2007. The 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 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 emigration. 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. 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[2]. 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). Third, the Italian population is immobile within the country (Del Boca and Venturini, 2003; Bruecher et al., 2011); hence, the inflow of immigrants coupled with the immobility of natives can intensify potential changes in local demand for housing units and housing prices.

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[3].

[1] See, for example, Brucker and Jahn (2008), Clark and Drinkwater (2008).

[2] For the considered period, dwellings constituted approximately 80 percent of total real assets of Italian households (Cannari et al., 2008).

[3] 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.

Also, 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.

The economic theory suggests that immigration affects prices through different and opposing mechanisms making the overall effect ambiguous and difficult to predict. 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. 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. 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; housing is considered as a non-tradable good with a relatively inelastic supply in the short term. Hence, changes in housing demand caused by intensive immigration may be translated into changes in local housing prices and rents. 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. Moreover, 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).

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. 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 adds some new empiric evidence to the recently emerging branch of literature dedicated to the influence of immigration on prices in general. Second, 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. 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. 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 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

There are only few studies considering the effect of immigration on the dynamics of prices for goods and services in general. The issue was first elucidated in Cortes (2008) and then in Frattini (2008), who consider the effect of immigration on prices in the UK and in the USA, respectively. The obtained results indicate that, 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 inflow of the relatively cheap labor force led to a reduction in the production costs of these services and 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 and in this case prices were probably influenced through the demand channel. 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. He finds that the inflow of immigrants led to a reduction in the grocery prices, which perhaps can be explained by the fact that these immigrants had higher price elasticity and lower search costs than the native population.

These studies document statistically significant, however, quantitatively limited effects of immigrants inflow on prices. 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. Moreover, these results coupled with the evidence found for the effect of immigration on wages (Dustmann et al., 2008)

point to the possible distributional consequences for the real income and wealth in the destination countries.

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. They have a rather descriptive nature and report a strong relation between the inflow of immigrants and housing prices[4]. 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. A more recent study by Saiz (2007) examines the impact of immigration on housing rents in American cities. The results point to 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. 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. In both cases, despite the relative increase in housing prices, the immigration shock did not alter the rent to income ratio or the so-called "rent burden" in Miami (Greulich, Quigley and Raphael, 2005).

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. Moreover, 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 contrast to the studies focused on US housing market Stillman and Mare (2008) find no evidence for a positive relationship between the inflow of foreign-born immigrants to an area and local housing prices in New Zealand.

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 on the dynamics of housing prices and residential construction activity. 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.

[4] See, for example, Muller and Espenshade (1985), Burnley, Murphy and Fagan (1997) as well as Ley and Tuchener (2001).

The above presented literature review indicates that it is quite complicated to draw general conclusions. First, the prevailing part of the conducted studies is single country analysis focused mainly on countries traditionally considered as main destinations for immigration flows. Second, the existing economic studies do not share a common judgment neither upon the direction nor upon on the magnitude of the effect.

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.

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 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. The empirical specifications are formally presented in, respectively, equations (1) and (2).

Specification 1

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

Specification 2

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

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 β capture the effect of immigrants on housing prices separately from the effect generated by natives. 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. In this case β captures the effect of changes in the concentration of immigrants on the value of residential units. In both specifications, $\boldsymbol{W_{it}}$ 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. μ_t is a set of year dummies, which captures the national trends in inflation and other macroeconomic processes. φ_i is a set of province dummies, which captures time-invariant province-specific characteristics. Finally, ε_{it} is the idiosyncratic error[5].

Obviously, the pooled OLS would lead to biased and inconsistent estimates due to the violation of the crucial assumption: that is contemporaneous exogeneity unconditional on unobserved heterogeneity. 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. To eliminate the time-invariant province specific effects the first difference technique is used[6]. Still, it, perhaps, fails tackling other major endogeneity issues, that 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.

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 does not take into account illegal migrants who do not necessarily have the same distribution pattern as legal ones across Italy[7]. This might lead to drawbacks related to *measurement error*, such as inconsistency and attenuation bias in estimates (Wooldridge, 2002). Bianci et al. (2008) concluded that once province and year fixed effects are taken into account (which is appropriately done in this study), regular immigrants are approximately proportional to total immigrant population.

The *reverse causality* is one of the issues that makes the identification of immigrants' impact on the dynamics of housing prices a complicated task. Housing prices by themselves may play an important role for immigrants while choosing the exact destination 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.

The inflow of immigrants may motivate natives to avoid or leave areas densely populated by immigrants, which brings into discussion another identification threat, that is the *native displacement* by immigrants (Card and DiNardo, 2000). The outflow of native population can be motivated by the fear of facing competition in the labor market. The displacement of natives from the area can weaken

[5] It would be reasonable to use as the main dependent variable the log concentration of immigrants instead. This 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. The following hypothesis has been tested: (H_0: $\beta = -\gamma$). The test 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 γ, held from using the log concentration of immigrants in the estimations.

[6] It requires strict exogeneity of the explanatory variables conditional on unobserved heterogeneity In reality, it is sufficient that the error term ε_{it} is uncorrelated with the explanatory variables in time *t-1*, *t* and *t+1*.

[7] The number of irregularly present foreign nationals in 2008 stood at between 279,000 to 461,000 (Kovacheva and Vogel, 2009).

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.

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 (complementarity or substitutability) 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 (Gavosto, Venturini and Vilossio, 1999; Venturini and Vilossio, 2002, 2006, 2008). 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. 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.

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 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 (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 (Card, 2000; Saiz, 2007; Cortes, 2008; Ottaviano and Peri, 2007; McKenzie and Rapoport, 2010). The instrumental variable used in this study is based not only on the historic settlement of overall immigration stock, but also on its composition based on the country of origin. The validity of this instrument relies on the assumption that "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 (3).

$$\overline{IMM_{it}} = \sum_c \vartheta_{i,c,t=0,} \cdot IMM_{Italy,c,t} \quad (3)$$

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*[8].

However, there are at least two reasons to apply a slightly different empirical approach in this particular work. First, 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 that the availability of only one instrument does not give the possibility to test if the excluded instruments are appropriately independent of the error process; in other words to run the overidentification test (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[9]. 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 estimator deals with the previously discussed problematic issues 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 potentially endogenous regressors by using their lagged values as instruments. To use the lagged endogenous variables as instruments, the validity requirements must be satisfied: (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.

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 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 (4).

[8] The result of the univariate regression confirms that the instrument fits the actual changes of immigrant population ($\Delta IMM_{it} = 1410{,}257 + 0{,}671\Delta\overline{IMM_{it}}$, F-statistic is equal to 855.74).

[9] 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.

$$E\left[\varepsilon_{it} | \ \mathbf{ln}(\boldsymbol{IMM_i})^{\boldsymbol{t-l}},\ \mathbf{ln}(\boldsymbol{NAT_i})^{\boldsymbol{T}}, \boldsymbol{W_i^T}, \mu_t, \varphi_i\right] = 0 \tag{4}$$

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

where $\mathbf{ln}(\boldsymbol{IMM_i})^{\boldsymbol{t-l}}$ is a vector of the lagged values of log number of immigrants beginning from the $\boldsymbol{l}^{\text{th}}$ lag. $\mathbf{ln}(\boldsymbol{NAT_i})^{\boldsymbol{T}}, \boldsymbol{W_i^T}$ are the vectors of the strictly exogenous variables, where *T* superscripts stand for all time periods[10]. This assumption implies the following moment restrictions to be held.

$$E\left[\mathbf{ln}(\boldsymbol{IMM_i})^{\boldsymbol{t-l}} \Delta\varepsilon_{it}\right] = \mathbf{0} \tag{5}$$

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

For the second specification, the sequential exogeneity assumption and corresponding moment conditions can be formally presented in the similar manner[11].

$$E\left[\varepsilon_{it} | \ \left(\frac{\boldsymbol{IMM_i}}{\boldsymbol{POP_i}}\right)^{\boldsymbol{t-l}}, \boldsymbol{W_i^T},\ \mu_t, \varphi_i\right] = 0 \tag{6}$$

$$E\left[\left(\frac{\boldsymbol{IMM_i}}{\boldsymbol{POP_i}}\right)^{\boldsymbol{t-l}} \Delta\varepsilon_{it}\right] = 0 \tag{7}$$

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

Where $\left(\frac{\boldsymbol{IMM_i}}{\boldsymbol{POP_i}}\right)^{\boldsymbol{t-l}}$ is a vector of lagged values of immigrants' concentration beginning from the $\boldsymbol{l}^{\text{th}}$ lag.

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 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 ε_{it}.

[10] 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.

[11] The full methodological description can is provided upon request.

The additional moment conditions for the first and the second specifications are presented in equations (8) and (9) respectively:

$$E\left[\Delta \ln(\boldsymbol{IMM_i})^{t-l}\varepsilon_{it}\right] = 0 \tag{8}$$

$$E\left[\Delta\left(\frac{\boldsymbol{IMM_i}}{\boldsymbol{POP_i}}\right)^{t-l}\varepsilon_{it}\right] = 0 \tag{9}$$

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

The GMM estimator minimizes the following quadratic form:

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

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

According to the GMM theory, the two-step approach is superior over one-step alternative, which however is undermined by the treat of severely downward biased in small samples[12]. However, the difference is possible to estimate; the corrected variance estimates approximate the finite sample variance well, leading to a more precise inference (Windmeijer, 2004).

4. Data Description

To estimate the impact of immigration on the dynamics of housing prices in Italian provinces sources of information have been used. Table 1 presents the descriptive statistics of the data used.

[12] 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.

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.

To measure the stock of immigrants in Italy, the information provided by the National Statistical office (ISTAT) is used. The estimates are based on the records taken at least 6 months after the reference date. This allows taking into account those foreign nationals who did not have permit of stay due to long practice of renewal or the first release, but were legally present in the country. 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 of the average housing values are based on the information from the Italian Survey on Household Income and Wealth (SHIW). 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[13].

The information on Gross Domestic Product and unemployment comes from Eurostat Statistical office of European Communities, Regional Statistics and LFS respectively.

Italian provinces correspond to the NUTS3 geographic disaggregation level. However, 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-Tempo, 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, the rest of information has been adjusted to the "103 provinces" format as well[14].

5 Results

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

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 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 β 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

[13] The number of observations *per* province varies from five to more than five hundred.

[14] The number of immigrants reported for new provinces were added to the provinces, which they geographically belonged to before separation.

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 Villosio, 2002). The pattern captured in the labor market might be present 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 cased 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. Moreover, the validity of this instrument is undermined by the fact that the base year is not far enough in time to predict the immigration flows independent from the current economic conditions.

The above presented results 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 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[15]. 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.

[15] To check for first-order serial correlation, one should look for second-order correlation in differences.

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 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.

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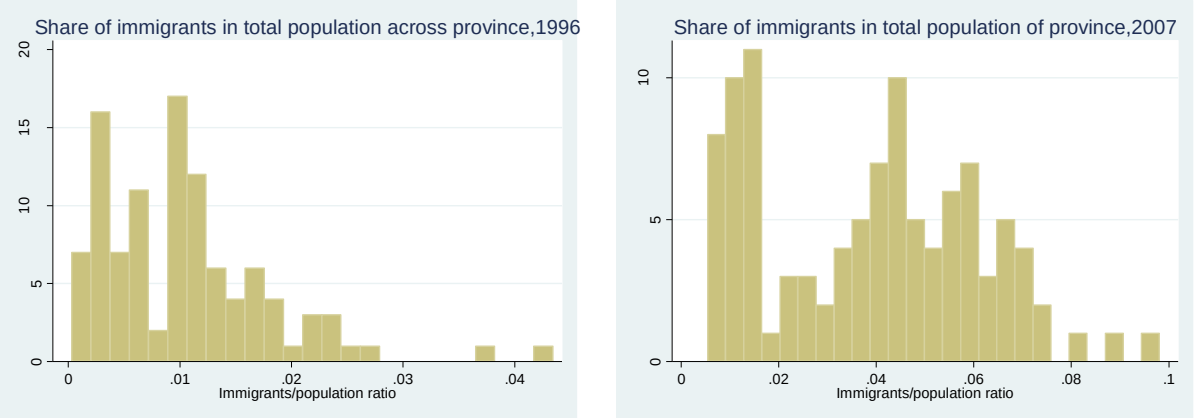
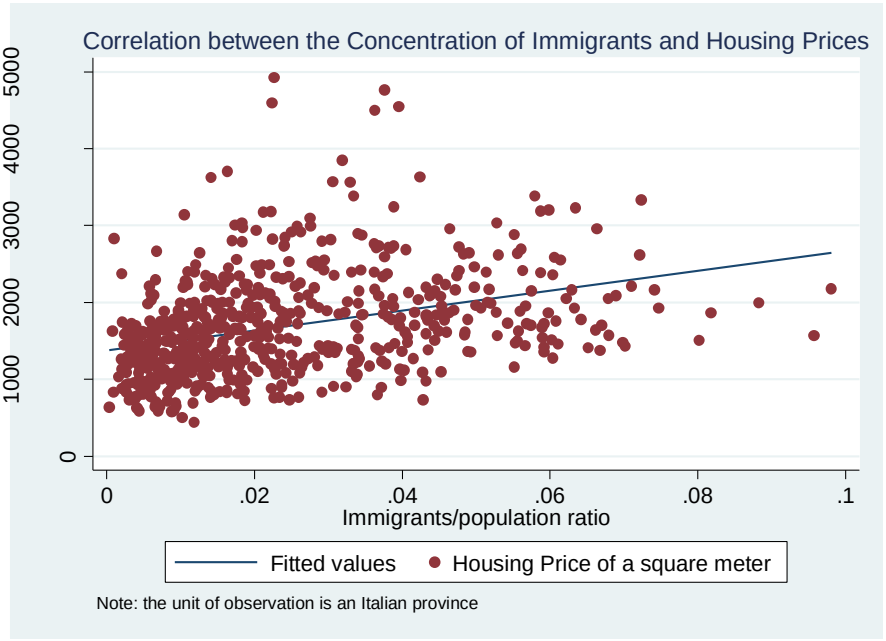
Appendix

Figure1
Distribution of Immigrants Across Italian Provinces



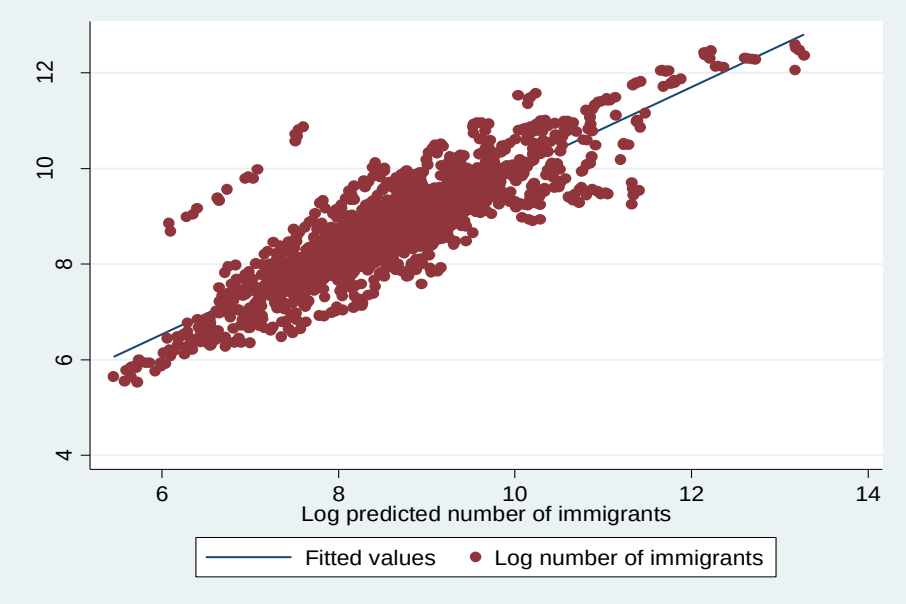
Note; This figure presents the evolution of the distribution of immigrants across Italian provinces during the period from 1996 to 2007.
Source: own calculation, data ISTAT.

Figure 2
Concentration of immigrants vs. Housing prices



Note: This graph presents correlation between the concentration of immigrants and housing prices per square meter.

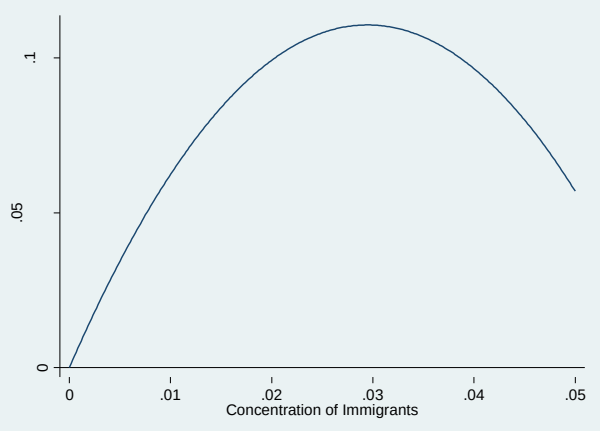
Figure 3
Actual vs. Predicted number of immigrants



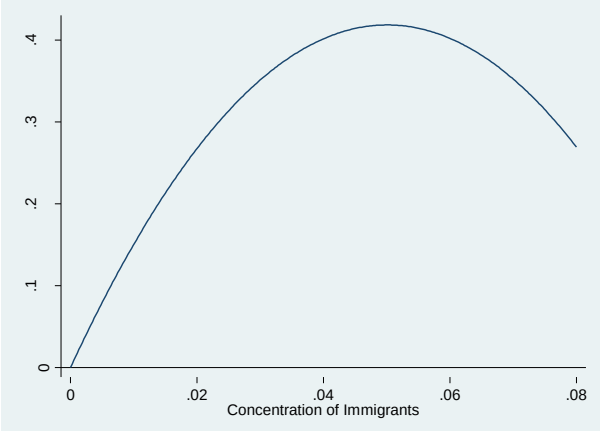
Note: This graph presents the correlation between the log actual number of immigrants and predicted number of immigrants in Italian provinces..

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)
Ln (Number of Immigrants)	0.213***	0.051	0.054*	0.398***	0.060*	0.373**	0.254	0.074
	(0.062)	(0.032)	(0.032)	(0.154)	(0.034)	(0.180)	(0.243)	(0.542)
Ln (Number of Immigrants)^2				-0.024**		-0.022*		
				(0.011)		(0.013)		(0.036)
Ln (Native)	0.333	0.472	0.580	0.808	0.600	0.659	0.723	0.682
	(1.044)	(0.662)	(0.725)	(0.755)	(0.717)	(0.728)	(0.755)	(0.7340
Unemployment rate			0.008	0.010*	0.008	0.009		0.013*
			(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)
Ln (GDP ppp/per capita)			0.468	0.546	0.407	0.435		0.276
			(0.398)	(0.393)	(0.408)	(0.407)	(0.444)	(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 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. 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***	-2.604	-3.391	7.789*	-3.361	7.513***	10.859	-12.419
	(2.271)	(2.263)	(2.263)	(4.228)	(2.668)	*(4.086)*	(29.276)	(14.981)
Concent. of immigrants^2				-127.372***		-127.469***		133.811
				(40.973)		(40.636)		(196.660)
Unemployment			0.010*	0.011*	0.009	0.009		0.012
			(0.006)	(0.005)	(0.006)	(0.006)	(0.009)	(0.007)
lnGDP(pps/per cap)			0.437	0.391	0.410	0.325		0.303
			(0.395)	(0.396)	(0.404)	(0.408)	(0.538)	(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 an IV estimations on a panel of biennial observations for 103 Italian provinces for the period 1996-2007. The 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. 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)
ln(Immigrants)	0.040	0.146	0.068	0.207	0.069**	0.265**	0.087*	0.276
	(0.035)	(0.308)	(0.057)	(0.271)	(0.034)	(0.119)	(0.047)	(0.226)
ln(Immigrants)^2		-0.008		-0.014		-0.016*		-0.018
		(0.024)		(0.022)		(0.008)		(0.016)
ln(Native)	-0.243	-0.093	-0.091	-0.016	-0.006	0.092*	-0.003	0.114
	(0.550)	(0.701)	(0.505)	(0.620)	(0.038)	(0.052)	(0.060)	-0.115
Unemployment rate	0.000	0.000	0.001	0.000	-0.002	-0.001	-0.004	-0.005
	(0.005)	(0.005)	(0.006)	(0.008)	(0.003)	(0.003)	(0.005)	(0.008)
ln (GDP *per capita*)	0.476*	0.510*	0.405	0.430	0.434***	0.650***	0.400*	0.737*
	(0.288)	(0.304)	(0.379)	(0.467)	(0.095)	(0.132)	(0.234)	(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	21.250	8.411	21.250	23.397	48.773	23.397	48.773
	[0.676]	[0.505]	[0.676]	[0.505]	[0.104]	[0.029]	[0.104]	[0.029]
Hansen			8.316	20.983			11.365	34.474
			[0.685]	[0.522]			[0.786]	[0.350]
M1 (AR(1))	-6.240	-6.163	-5.55	-5.414	-6.886	-6.698	-5.497	-5.377
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
M2 (AR(2))	-1.778	-1.751	-2.228	-2.101	-1.954	-1.940	-2.189	-2.07
	[0.075]	[0.080]	[0.026]	[0.036]	[0.051]	[0.052]	[0.029]	[0.038]
M3 (AR(3))	0.759	0.724	1.031	0.823	0.931	0.823	1.156	0.909
	[0.448]	[0.469]	[0.302]	[0.411]	[0.352]	[0.411]	[0.248]	[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. The log average housing prices in provinces is the dependent variable. 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	12.697**	5.779	14.370	-2.858**	20.693***	-3.796	16.707**
	(4.867)	(6.013)	(9.147)	(8.846)	(1.374)	(3.926)	(2.931)	(7.961)
Concent. of imm.		-100.938**		-121.910**		-191.975***		-166.731**
		(50.242)		(50.744)		(36.882)		(68.299)
Unemployment rate	-0.001	-0.001	-0.001	0.003	0.004	0.005	0.001	0.006
	(0.005)	(0.005)	(0.008)	(0.008)	(0.003)	(0.003)	(0.008)	(0.007)
ln (GDP per capita)	0.504*	0.397	0.135	0.375	0.884***	0.465***	0.962***	0.662**
	(0.289)	(0.293)	(0.418)	(0.321)	(0.092)	(0.099)	(0.275)	(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	16.444	12.668	16.664	44.609	71.204	75.964	71.204
	[0.316]	[0.793]	[0.316]	[0.825]	[0.000]	[0.000]	[0.000]	[0.000]
Hansen			12.883	14.454			23.207	27.258
			[0.301]	[0.913]			[0.143]	[0.706]
M1 (AR(1))	-6.195	-6.195	-5.494	-5.446	-6.668	-11.921	-11.921	-5.306
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
M2 (AR(2))	-1.745	-1.716	-2.169	-2.057	-1.949	-4.017	-4.017	-1.958
	[0.081]	[0.086]	[0.030]	[0.040]	[0.051]	[0.073]	[0.026]	[0.050]
M3 (AR(3))	0.827	0.791	1.100	0.968	0.591	0.678	0.730	0.797
	[0.408]	[0.429]	[0.271]	[0.333]	[0.555]	[0.498]	[0.465]	[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. The log average housing prices in provinces is the dependent variable. 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