AN ASSESSMENT OF THE IMMIGRATION IMPACT ON THE INTERNATIONAL HOUSING PRICE

Teodora Cristina Barbu[1], Mariana Vuță[2*], Adina Ionela Străchinaru[3] and Sorin Iulian Cioacă[4]

[1)2)3)4] The Bucharest University of Economic Studies, Romania

Please cite this article as:
Barbu, T.C, Vuță, M., Străchinaru, A.I. and Cioacă, S.I., 2017. An Assessment of the Immigration Impact on the International Housing Price. *Amfiteatru Economic*, 19(46), pp. 682-695

Article History:
Received: 30 March 2017
Revised: 17 May 2017
Accepted: 29 May 2017

Abstract
The article highlights the correlation between the evolution of the housing price, as measured by House Price Index, the flow of immigrants and other macroeconomic variables for a sample of 21 representative countries for the period 2007-2014. The proposed model explains and highlights the existence of a positive link between the House Price Index evolution and the flow of immigrants, market capitalization share to Gross Domestic Product and the growth rate of the economy. The novelty of this study is derived from the use of panel data models, the results indicating that for one percent increase in immigration (measured by the flow of immigrants), the housing price changes, in the same way, by 0.045%. It confirms the existence of a positive link, although not significant to the level of the housing price. The article is divided into four parts: the first part explains the choice of this topic; the second part presents an overview of the main ideas that are found in the literature; the third part presents the methodology and models applied to identify the immigration impact on the housing price and the fourth part contains conclusions, test limits and future research directions.

Keywords: immigration, house price index (HPI), unemployment rate, capital market, economic growth.

JEL Classification: F22, J11.

* Corresponding author, **Mariana Vuță -** vuta.mariana@fin.ase.ro

Introduction

The crisis of the immigrants coming to the European countries, starting from 2015, raised the interest of the researchers and academia to the effects of immigration on the economies of the host countries. Various studies on this topic tried to find answers to questions about the effects of immigration on the global economy, the impact on GDP, effects on the labor market and, not least, the real estate market, respectively, the price of real estate.

Located at the confluence of social, demographic and fiscal policy, immigration is a common topic today, requiring scrutinity from the national and international authorities, due to the short and long term effects they generate, both in the host countries and in the countries of origin. Mainly, the studies of immigration impact on various macroeconomic variables focused on voluntary immigration, meaning that the immigrantion was motivated by economic or social grounds, as by other reasons, such as studying abroad, more favorable environmental conditions (enviromental migration) or temporary jobs (seasonal migration).

The immigration effects on the host countries were identified by studying the immigration flow to countries such as USA, Canada, Switzerland, New Zealand, Norway and Spain, emphasizing that the immigration had both positive and negative outcomes. Thus, in the host country, immigration increased aggregate demand, generating new opportunities for consumption, increased the variety of goods and services, enhanced flexibility on the labor market, covered the workplaces for 3D jobs (dirty, dangerous, difficult). Besides, there were also negative social effects on the labor market, on the living standards of the native population and on its housing decisions.

The demand for housing, as part of global demand to which immigrants exerts a significant impact, is the starting point for this study. This paper analysis the housing price dynamics under the immigrants flow impact for the 2007-2014 time frame, for 21 most preferred host countries from Europe, Asia and America, using panel data regressions. The chosen time frame relates to the period characterized by the boom in the housing market and the massive flow of voluntary immigrants. The selection of the countries included in this study was based on the ranking of the international migration areas of origin to destination areas in million people (see Figure 1, below). Between 1990 and 2015, Asia, Europe and North America recorded the highest flow of immigrants, adding about 27 million immigrants, that is about 1.1 million annually.

During this period, the share of international immigrants in the total population has changed, increasing in Europe and North America, while in other areas there were no significant changes. Thus, according to official data (United Nations, 2015), the share of immigrants increased from 9.8% to 15.2% of the population in the North America, while in Europe, the change is from 6.8% in 1990 to 10.3% in 2015. On migration corridors for the period 1990-2015, we find that Asia-Asia recorded a significant increase, reaching almost 1.8 million/year between 2010-2015. The migration corridor Europe-Europe ranks third, followed by Latin America corridor - North America (Figure no. 1).

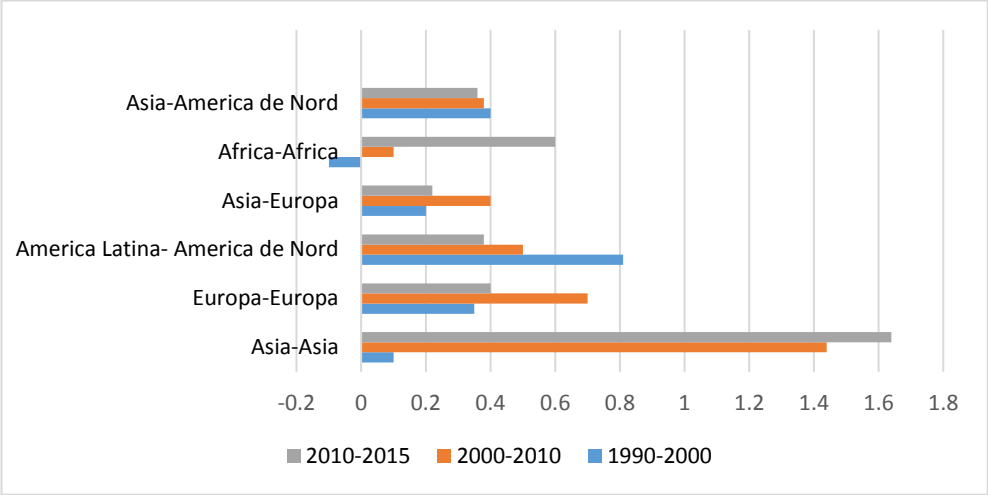

Figure no. 1: Annual average change of the international migrants, 1990-2015
Source: United Nations, 2015

1. Literature review

Several authors have turned their attention to identify the impact that the flow of immigrants has exercised on the housing price, given that the housing market boom was contemporary with significant immigration waves. We summarized the main results obtained by various researchers, focused on studying the effects of macroeconomic variables on housing prices, as they found particular elements from different countries, such as the US, New Zealand, Europe (Switzerland, Great Britain, Norway, Spain, Ireland).

Cvijanovic et al. (2010) analyze the impact of migration on housing prices on the US case, highlighting the link between the demographic factor and the consumption of real estate. The influence of the demographic factor consists, on the one hand, on the natural population growth, which is a slow and predictable phenomenon and, on the other hand, in the non-natural growth (immigration), which occurs rapidly and unexpectedly, resulting in genuine demographic shocks. Taking into account any country where the housing market had a particular dynamic, the authors tried to assess the extent to which immigration flows directly influence the mortgage market and the housing price. The conclusion is that the housing market supply is inelastic in the short term.

Generally, the immigrant population continues to be a key element in the housing market due to their appetite to hold their own homes, especially in the US, the country where housing immigrants accounted for 27.5% of the increase in the number of houses from 1994 up to date (White, 2015). A Report of the Americas Society/Council of the Americas (Vigdor et al., 2013), in partnership with New American Economy, had estimated the impact of immigration on the housing price in dollars and cents, using data on population and mortgage market for the period 1970-2010. The results indicate that every immigrant added 11.6 cents to the housing price, leading in the US states with a high density of population to an increase in the housing value during a 40-year time interval.

The impact of immigration inflow on the housing price was also analyzed considering the native population's attitude towards the arrived immigrants and native's decision to move to neighboring areas. As such, the immigrants modified the social and demographic structures, notably with significant effects on the local population. Saiz and Wachter (2011) estimated the impact of immigration on the native population dynamics and neighboring residential areas. The authors argue that if the native population show a negative attitude towards immigrants and reject them, then the population will prefer other regions and will prefer to relocate. The effects will be found both on the initial housing market, where there will be a smaller native population, as well as on the area where the natives have migrated from.

Regarding the impact that immigration has on the mortgage market, records are not relevant in the sense that there is not a clear relationship between the variables. Taylor (2014) notes that there are a number of difficulties of immigrants to have access to mortgages, among them: communication barriers in contract terms specific to the housing market, the absence of a credit history, absence of stable employment, insufficient income. Under these conditions, the impact of immigrants on the mortgage market is limited, meaning that the access to the housing market should be carried out without loans. This increases the renting market, especially the one located in crowded areas, with low living standards.

On the other hand, Andersson (2014) investigates the correlation between the stock market, given by the equity index Standard & Poor's 500 Index (S&P 500) and housing market in the US, given by the National Home Price Index S&P/Case-Shiller, during 1987-2013, considering that the two types of assets are important to the population wealth. The study shows that there is a strong and positive correlation between the two markets, namely a change of one percent in the share market affects the housing market by 0.032581%, but not immediately (three years later). One of the most attractive destinations for immigrants is the **New Zealand**, because of the free markets and the democratic nature of the society, regardless of the intended purposes - education, employment, business or investment.

The assessment of the impact of immigrant's flows on the housing price led to different results, depending on the region or country of destination and the time frame considered. Thus, Coleman and Landon- Lane (2007) estimated the impact of immigration in New Zealand, using a VAR model, finding that a 1% inflow of immigrants (expressed as of population) lead to an increase by 10% in the short term housing price. Also, Stillman and Maré (2008) examined to what extent changes in the population structure, internal immigration and international immigration, influence rents and prices for apartments and houses. They found that an increase with 1% in population will be associated with a change of 0.2%-0.5% of the housing price in the analyzed areas. The changes the immigration produces on housing price is also given by the way the newly arrived population is assimilated by the host population. Thus, Chanpiwal (2013) examines the response of New Zealand mortgage market to the shocks generated by immigrants. The study is based on data from the period 1996-2011 and show a positive correlation between migration and housing price, meaning that an increase with 1% in the number of immigrants leads to a price increase on average by 7.5%.

Particularities of **Switzerland** as a destination country for immigrants were highlighted in the study by Basten and Koch (2016), which analyzes the supply and demand in the mortgage market, taking into account the shocks that the immigrant population had on the housing price. The result indicates that an increase in housing price by 1% leads to an increase of 0.52% of the amounts granted as mortgages. In Switzerland, studies show that

the immigrants do not acquire tangible assets and, in particular, do not do it the first year of arrival in the country. Immigrants indirectly impact the housing price, as the demand for housing increases rents. Under these influences, the native people decide to buy houses, so the demand comes from native citizens, but as housing supply is inelastic in the short term, will lead to rising housing price.

In the case of **Great Britain**, the origin country and the financial condition of the immigrants may impact, in different ways, the housing price. Based on historical data on immigration, McDonald (2013) developed a model to estimate the immigration correlation with different variables, among them the house price: 1000 arrivals of immigrants from Europe and the UK, housing price increased by 8% after two years, while if people come from Asia, the price increase is only 6%.

Some studies on the immigration`s impact on housing price focused on the London market, which in recent years, has experienced a strong pressure. Migration Advisory Committee (2012) made an analysis based on the number of visas granted in the UK, showing that the long-term impact of a further application for housing depends on the responsiveness of the supply. Estimates show that immigrants add 8% to the annual demand for housing. This relationship must be considered when calculating the additional cost for Britain's natives, resulting from lax/narrow immigration policies.

The rationale of such an impact is also found in Sá (2015), who examines the housing price in Great Britain in the 159 territorial units from England and Wales, for 2003-2010. The derived conclusion is that the immigration has a negative effect on the housing price, caused by the mobility of British native people, who, when native villages are populated by immigrants, prefer to move elsewhere. These moves will result in a decrease in demand for homes in these areas, which will lead to lower price. The effects that housing price drives on the labor market supply is examined by Disney and Gathergood (2014). Estimates show that the demand in the labor market responds to changes in the housing price, by type owners: married women, men, youth, adults etc.

Another analyzed country is **Norway**. Thus, Nordbϕ (2013) and Frostad (2014) estimate the housing price elasticity in the case of an increase in the immigrant population share of 1% in the total population. The results are similar, indicating, based on the observations during the period 1986-2012, that the housing price increased by 2.6% to 3.3%, according to the first author, and by 2.95% according to the second author. These results are supported by Saiz (2006), Elliason (2017) and Kalantaryan (2013).

Some authors argue that the immigrants shock does not occur in the real estate market, being driven through the labor market channel. Furlanetto and Robstad (2016) investigated systematically and in a consistent framework data for Norway, the impact of immigration on standard variables such as unemployment, housing price, public finances, exchange rate, labor productivity. By considering in a VAR model the housing price as unrestricted variable, the authors concluded that shocks induced by immigrant flows have no impact on housing price, as they are routed through labor supply channel. The possible explanation is that a large proportion of immigrants were coming from Poland and Lithuania, that were working in construction and mostly do not intend to acquire houses, but are involved in the housing supply, by construction of new ones.

The empirical study conducted by Gonzalez and Ortega (2009) on the **Spanish** case highlights the effects of immigration on the housing price and residential development in

1998-2008. This country is a relevant case because the period corresponds to both real estate boom, and to the wave of immigration. On average, in the selected period, Spain received flows of immigrants equal to 17% of the working population, which led, on the one hand, to the rising housing price on average by 52% and, on the other hand, it resulted in 37% of the new construction.

Developments in the housing market, the structural characteristics and development cycles of residential property affect the financial stability. "Report on residential real estate and financial stability in the EU" (2015) shows that the housing market has an important role in the economy and contribute to the development of the financial system. This market varies significantly from state to state, and housing price dynamics is given by supply and demand; for the demand an important place is occupied by the demographics factors and immigration can generate a strong impact. Age composition of the population and behavioral aspects are important and explain the differences between the regions, while differences in income leads to the appeal of certain regions, which presses the demand for housing in the region. Also, in supporting our scientific approach, we believe as relevant other arguments that we find in the literature regarding the factors influencing the housing price.

Generally, the development of housing price index was also emphasized by correlation with unemployment. In this respect, Geerolf and Grjebine (2014) investigated the causal relationship between changes in the housing price and the unemployment dynamics using data from 34 countries for a period of 40 years. The relevant indicator for the expression index was the property tax, because the authors found that they are more influenced by local politics than by the macroeconomic factors. The result indicates that an increase with 10% in the level of property taxes involve a reduction in the unemployment rate of 3.4%. If the housing price directly impacts the jobs in construction, this will have an effect on the overall rate of unemployment, due to non-residential investment and changes in the consumption levels, resulting in demand for labor. As the housing price impacts the labor market demand through consumption channel, therefore the consumption also is negatively correlated with unemployment.

Pinter (2015) focuses in the same direction and makes a comparative study of the impact of housing price has on unemployment in the US and UK, from the indicators in these countries. The results indicate that the housing price shock explains almost 20% -30% of unemployment fluctuations, by guarantees channel for housing loans as the major cause of the recession in 2008. The negative relationship between the price level of real estate assets in a country and the unemployment rate is also supported in the literature by Mernagh (2014). His study on the case of Ireland, over a period of 2005-2013, highlights a negative correlation of - 0.90 between the quarterly house price and unemployment rate. Zandi et. al. (2015) and (Barakova, 2003) highlight the direct impact of interest rates on HPI's evolution, concluding that a favorable interest rate will trigger an increase in housing demand, which will positively influence the price on the real estate market.

In our opinion, all studies concerning the immigration impact on the real estate market took into account only one country, the level of which was quantified this effect (the common point of the study is to highlight a correlation between the demographic factor and the housing price). Moreover, studies in the same country with available data for the same period lead to different results. This motivates us to foster the analysis in this field, by considering a representative sample of countries and testing, based on regression applied to panel data, developments in the house price index, under the impact of macroeconomic

factors: economic growth, market capitalization to GDP, the S&P Global Equity, the interest rate on mortgages, unemployment and immigration.

2. Testing the impact of macroeconomic variables on the housing price

2.1. Research methodology

This study aims at assessing the house price movement, of a representative set of countries, under the influence of some macroeconomic factors. As the House Price Index – HPI is representative for the housing price dynamics, we tested its relation with indicators that reveal the economic growth, unemployment, capital market's performance of every country (as given by the specific indicators such as the market capitalization as percentage of GDP and the S&P Global Equity index) and the interest rate used in mortgages. We do believe that these indicators are important, as their evolution showed the diagnosis of the each country's financial system. Moreover, as the housing price is strongly influenced by demographic factors, we also considered, as explanatory variable, a relevant indicator for the migration flows, namely, the migration dynamics, calculated as the ratio of migrants in a period of time to the migrants in the previous period, of which we subtracted one.

The models were based on the assumption that immigration positively affects the evolution of housing prices, analysis preceded by the assessment of the mortgage market trend also under the influence of some macroeconomic factors. As a result, the scientific approach started from the following hypotheses of research:

H_1: HPI is positively influenced by the flow of immigrants;
H_2: Market capitalization positively affects HPI;
H_3: Economic growth has a positive influence on the housing price index;
H_4: HPI is positively influenced by the stock market index;
H_5: The influence of the unemployment rate on the HPI is negative;
H_6: There is an inversely proportional relationship between interest rate and HPI.

In this respect, a panel data model (Baltagi, 2008) was estimated using EViews 8 and the following equation:

$$y_{it} = \alpha + X'_{it}\beta + \mu_i + \vartheta_{it} \text{ i=1, ... ,N; t=1,...,}\mathbf{T} \quad \mathbf{(1)}$$

in which:

i= cross-section dimension (transversal section);

t=time (time series dimension);

α, β= the equation's coefficients;

X'_{it}= the *it* item for the explanatory variables;

u_{it}= specifi effect-unobservable individual and

ϑ_{it}= the noise.

The econometric analysis of panel data time series considers finding the two types of models: the fixed effect model or the random effect model. The choice for the most accurate model is made using the Haussman test. The test group includes 21 countries:

Austria, Belgium, The Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Russia, Slovenia, Sweden, Great Britain and the United States of America. The migration process is best illustrated in these countries in an extended and correct manner. Moreover, due to their economic situation, all these countries have registered, during the studied period, major swings in the number of immigrants.

When structuring the data series, we considered the available data for 2007-2014 time frame. The reason for this choice of time frame is related to the fact that the housing boom and the high flow of migration essentially marked the last decade of this century. The available observations is not enough for structuring a time series model, therefore we focused on a panel data model, in order to link the house pricing to migration and other macro-economic variables.

To this purpose, the available data for the 2007-2014 time frame were collected, including the House Price Index, the HPI variable, data related to the economic growth (GDP growth, GDP_GR variable), data related to unemployment (unemployment, the UNEM variable), development of the capital market in each country (as related to the annual adjustment of S&P Global Equity index value, the SP variable, as well as the weight of the stock exchange capitalization in the GDP, the MARKET_CAPITALIZATION variable) and the relevant rate defining new credits (the INT_RATE variable). We used the data available on the World Bank website (www.worldbank.org), EU Office for Statistics, Eurostat (http://ec.europa.eu/eurostat), on the web sites of the central banks in the analyzed countries and data provided by the capital markets operators.

In order to assess the migration process we used data on migration published on OECD site. We made estimates of the migration phenomenon based on an analysis of the INFLOWS variable, representing the influx of migrants coming to each of the above-mentioned countries.

2.2. Results and discussions

In order to analyze the correlations between the house market development (as represented by the House Price Index - HPI) and some of the most relevant macro-economic indexes, we employed methods relevant for the panel type date. Prior to this analysis, Figure no.2 illustrates the evolution of the housing price index and the evolution of immigration. According to Figure no.2, we can observe the existence of a close connection and an evolution in the same sense of these two variables, during the entire analyzed period, namely the years 2007-2014.

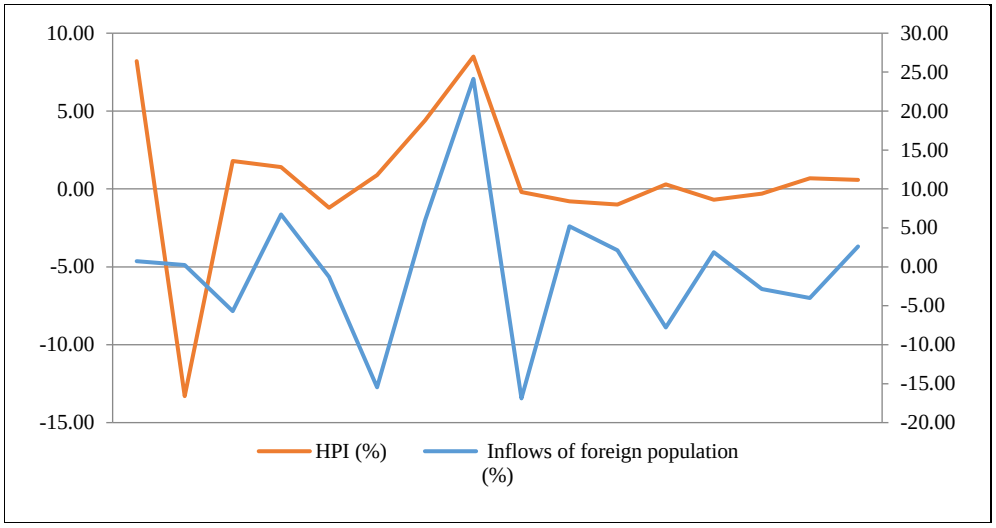

Figure no. 2: Relationship between the housing price index and immigration
Source: own calculations

Moreover, the link between these two variables is also evidenced by the coefficient of correlation of 0.289586, identified by the correlation matrix presented in Table no. 1.

Table no. 1: Correlation matrix of the regression model variables

	HPI	INFLOWS
HPI	1	0.289586
INFLOWS	0.289586	1

Source: own calculations, using Eviews

Starting from the positive relationship between the housing price index and the evolution of immigration, we used the data set collected for the period 2007-2014 to verify the above mentioned hypotheses. In this sense, we used models that apply to panel data to highlight the existence of a relationship between the House Price Index (HPI) and some of the most relevant macroeconomic indicators. For this purpose, we consider a model which takes into account the HPI, INFLOWS, MARKET_CAPITALIZATION, S_P, UNEMPLOYMENT, INT_RATE and GDP_GR, as shown by the results in Table no.2. As it can be seen in Table no.2, the analysis of the correlations between the endogenous variable and the exogenous variables will be captured from the random-effect model.

Therefore, the proposed model accounts for 48.55% of the evolution of the dependent HPI variable and highlights the existence of a positive link between the HPI index and the migrants inflow in a particular country, the stock exchange capitalization weight in the GDP and the economic growth factor. This result confirms the empirical data showing a positive impact of the economic growth and of the capital market development on real estate price. Moreover, the results point to the negative link between the real estate value and inflation, which can be explained by the increased demand for renting/buying houses as

a result of the demographic growth. As the number of migrants is increasing, the demand for new houses increases directly influencing the real estate value. There is a direct impact on the level of demand for buying new houses, whereas there is an indirect impact at the level of the renting market. A raise in rent values will reshape the real estate acquisition options both for the migrants and for the native population. According to this model, the increase by 1% of the migration (measured as the inflow of migrants), the price of real estate would increase by 0.037%, confirming the fact that there is a positive link between the two factors, if not a direct one.

Table no. 2: The model for the HPI variable, considering 6 independent variables, for the 2007-2014 time frame

Correlated Random Effects - Hausman Test				
Test Summary		**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random		**5.809.562**	**6**	**0.4449**
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	9.969.071	3.410.091	2.923.403	0.0040
INFLOWS	0.037645	0.017833	2.110.916	0.0365
MARKET_CAPITALIZATION	0.002365	0.021953	0.107744	0.9143
S_P	-0.001423	0.018144	-0.078435	0.9376
UNEMPLOYMENT	-0.997981	0.185718	-5.373.642	0.0000
INT_RATE	-0.440517	0.496130	-0.887906	0.3761
GDP_GR	0.333011	0.216217	1.540.166	0.1257
R-squared		0.485585		

Source: own calculation, using EViews

Analyzing this model, we can find a negative relationship between the capital market evolution, as measured by the SP indicator (that assess the returns from the financial market) and the real estate market, as measured by the HPI index, a relation that can be explained by the presence of a substitution effect between the assets that are traded on these two markets.

Moreover, the presence of the substitution effect between the assets traded on the capital and the real estate market can be explained also by the characteristics of the analyzed period, in particular the manifestation of major turbulences in the two markets, whose evolution was divergent after the major episode of the financial crisis generated by the subprime loans. For example, the capital market in most developed countries had a strong positive evolution, exceeding historical maximum levels of stock indices, while the real estate market has gone through a recovery process, but not as dynamic.

In this study we started from the assumption that there would be a positive relationship between the house price index and the stock market, an idea debated and sustained in the literature as well. However, for the chosen sample of countries and the analyzed period, the result of the study rejects the hypothesis outlined above (hypothesis 4), according to which

the equity market index positively influences the HPI. From Table no.2 it can be noticed that the negative relation between the level of real estate prices in a country and the unemployment rate confirms the empirical observations, given the fact that the increase in the number of unemployed persons has the effect, among other things, of reducing the demand for housing and, consequently, the reduction of the price of real estate assets.

Similarly, the negative relation between the real estate price and the mortgage interest rate is confirmed also by the model (even though the coefficient is not statistically significant), emphasizing the negative impact the price of mortgages has on the real estate price (by lowering the demand for mortgages that can finance the real estate acquisitions). Considering this correlation, we must assert that the immigrants use in a small scale the mortgages to buy properties, especially immediately after their coming into a country, as they cannot prove their credit history (from the country of origin) and they are not totally financial included in their new home country.

We will enhance this model by removing those independent variables that are not statistically significant, the results of a new model (obtained by removing the gdp_gr variable) being presented in Table no.3. The model presented in Table no.3 emphasizes once more the positive impact that the immigration phenomenon and the share of the stock market capitalization on GDP have on the housing price, as well as the negative effect induced by the unemployment rate, all the hypotheses of the research being confirmed, except for the fourth hypothesis.

Table no. 3: The model for the HPI variable, considering 3 independent variables, for the 2007-2014 time frame

Correlated Random Effects - Hausman Test				
Test Summary		**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random		**4.298.748**	**3**	**0.2310**
Dependent variable	**Independent variable**	**Coefficient**	**Prob.**	**R-squared**
HPI	INFLOWS	0.045024	0.0100	0.469612
	MARKET_CAPITALIZATION	0.006804	0.6498	
	UNEMPLOYMENT	-0.947513	0.0000	

Source: own calculation, using EViews

Moreover, the positive positive link between HPI and economic growth is confirmed by other authors such as Piazzesi and Schneider (2009) and Zhu (2006). Considering the significance level of 5%, it can be concluded that the most relevant indicators in explaining the real estate price, of the 6 above-mentioned, are the level of immigrants and the unemployment rate, fact confirmed both by the literature and the economic reality.

Conclusions

In conclusion, the data for the period 2007-2014 for a number of 21 countries confirmed the existence of a positive relationship between the evolution of the housing price and the flow of immigrants corresponding to the selected sample. This result shows the effects in the housing market induced by the presence of the immigration phenomenon for the analyzed countries, as an increase of the immigration flow (measured by the percentage change in the number of immigrants) lead to a change, in the same direction, of the housing price (measured by the HPI index), with approximately 0.045%. Moreover, the change in HPI index can be explained in proportion of almost 46.96% by the most relevant indicators used in the model, respectively the immigration flow, the unemployment rate and the market capitalization.

One explanation for this evolution is given by the increasing demand for real estate assets generated by the immigrants (even for living, as owned property, but, even more, for rented properties). Increasing demand on the real estate market (by increasing rents) and changing its structure lead to rising real estate prices. As a consequence, the hypotheses listed in the methodology have been confirmed, with the exception of the fourth hypothesis, which supports a positive relationship between HPI and the representative stock market index.

Similar studies (Zandi et al., 2015) capture the influence of some economic factors on HPI in Penang Island (Malaysia), being considered one of the most developed countries in economic and industrial terms. The analysis was made for the period 2007-2014 and the main purpose was to measure the relationship between HPI and various economic variables such as: economic growth, inflation rate, income, interest rate and real estate tax rate. The authors concluded that there is a positive influence from all the economic factors included in the model against the HPI, and among the factors directly influencing the HPI are the interest rate and economic growth. The positive relationship between HPI and the inflation rate is also underlined by the authors Piazzesi and Schneider (2009), so an increase in the inflation rate leads to an increase in the housing price index.

In this context, new research directions can be identified, starting from the study of the impact that other indicators of the immigration phenomenon (such as immigration dynamics) and the migration of the native population towards neighboring areas, away from the inhabited areas) may have on the rise in price of real estate assets and financial assets. Moreover, taking into account the study's limitations (the small number of countries that capture the immigration process and the relatively small period to reflect an overall trend towards house price developments), another direction of further research may be in the direction of enlargement the sample of countries and the observation period, respectively up to the level of 2016, in order to capture the new effects induced by the wave of immigrants in Europe. At the same time, establishing a distinction between volunteer and involuntary immigrants would better highlight the effects of immigration on the price housing.

Bibliography

Andersson, E., 2014. *The Relationship Between House Prices and the Stock Market: An investigation of the American markets.* Master's Thesis in Economics and Finance. Jönköping International Business School - Jönköping University. [online] Available at: <https://www.diva-portal.org/smash/get/diva2:725091/FULLTEXT01.pdf>[accesed 15 March 2017].

Baltagi, B.H., 2008. *Econometric Analysis of Panel Data*, 4rd ed. Chichester: John Wiley & Sons.

Barakova, I., Bostic, R.W., Calem, P.S. and Wachter, S.M., 2003. Does credit quality for homeownership. *Journal of Housing Economics*, 12(4), pp.318-336.

Basten, C. and Koch, C., 2016. The causal effect of house prices on mortgage demand and mortgage supply: evidence from Switzerland. *BIS Working Papers*, 555, pp.1-50.

Chanpiwal, N., 2013. *Estimating the impact of immigration on hausing prices and hausing affordability*. [online] New Zeeland AUT Bussines School. Available at: <http://aut.researchgateway.ac.nz/bitstream/handle/10292/5573/ChanpiwatN.pdf?sequence=4> [accessed 15 March 2017].

Coleman, A. and Landon-Lane, J., 2007. Housing Markets and Migration in New Zealand - 1962-2006. *Reserve Bank of New Zealand Discussion Paper* series DP2007/12. [online] Available at: <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/ Publications/ Discussion%20papers/2007/dp07-12.pdf> [accessed 15 March 2017].

Cvijanovic, D., Favilukis, J. and Polk, C., 2010. *New in Town: Demographics, Immigration, and the Price of Real Estate*. [pdf] London School of Economics. Available at: <http://personal.lse.ac.uk/polk/research/ HousingDemographics_ 20100404.pdf> [accessed 14 March 2017].

Disney, R. and Gathergood, J., 2014. House prices wealth effect and labor supply. *IFS Working Paper* W14/25. [online] Available at: <https://www.nottingham.ac.uk/cfcm/ documents/papers/cfcm-2015-19.pdf> [accessed 28 March 2017].

Elíasson, L., 2017. Icelandic boom and bust: immigration and the housing market. *Housing Studies*, 32(1), pp.35-59.

Expert Group on Real Estate, 2015. *Report on residential real estate and financial stability in the EU*. [online] ESRB. Available at: <www.esrb.europa.eu> [accessed 29January 2017].

Frostad, A. Ø., 2014. *Immigration and House Prices in Norway.* [online] Norwegian University of Science and Technology. Available at: <https://brage.bibsys.no/xmlui/ bitstream /handle/11250/267626/753263_FULLTEXT01.pdf?sequence=1> [accessed 22 March 2017].

Furlanetto, F. and Robstad, Ø., 2016. Immigration and the macroeconomy: some new empirical evidence. *Norges Bank Working Paper,*18, pp.1-40.

Geerolf, F. and Grjebine, T., 2014. Assessing House price Effects on Unemployment dynamics. *CEPII Working Paper,* 25, pp.1-55.

Gonzales, L. and Ortega, F., 2009. *Immigration and Housing Booms - Evidence from Spain* - Discussion Paper No. 4333. [online] Available at: <http://ftp.iza. org /dp4333.pdf> [accessed 15 March 2017].

Kalantaryan, S., 2013. *Housing Market Responses to Immigration; Evidence from Italy* - EUI Working Paper RSCAS 2013/83. [online] Robert Schuman Centre for Advanced Studies Migration Policy Centre. Available at: <http://cadmus.eui.eu/bitstream/handle /1814/28918/ RSCAS_2013_83.pdf> [accessed 19 March 2017].

McDonald, C., 2013. Migration and the housing market. *Reserve Bank of New Zealand Analytical Note Serie*s, 10, pp.1-19.

Mernagh, M., 2014. House prices and unemployment: a story of linked fortunes. *Significance Magazine*. [online] Available at:<https://www.significancemagazine.com

/business/142-house-prices-and-unemployment-a-story-of-linked-fortunes-ireland> [accessed 8 June 2017].

Migration Advisory Committee, 2012. *Analysis of the Impacts of Migration*. [online] Available at: <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file /257235/analysis-of-the-impacts.pdf> [accessed 9 March 2017].

Nordbø, E.W., 2013. I*nnvandringogboligpriseriNorge - Norges Bank staff memo*. [online] Available at: <http://www.norges-bank.no/pages/94360/Staff_memo_2013_08.pdf.> [accessed 15 March 2017].

Piazzesi, M. and Schneider, M., 2009. Momentum Traders in the Housing Market: Survey Evidence and a Search Model. *American Economic Review: Papers & Proceedings*, 99 (2), pp.406-441.

Pinter, G., 2015. *Prices House Prices and Job Losses*. [online] Bank of England working papers. Available at: <http://www.bankofengland. co.uk/research/Documents/ workingpapers/2015/swp569.pdf> [accessed 25 March 2017].

Sá, F., 2015. Immigration and House Prices in the UK. *The Economic Journal*, 125(587), pp.1393-1424.

Saiz, A., 2006. Immigration and Housing Rents in American Cities. *IZA Discussion paper*, 2189, pp.1-43.

Saiz, A. and Wachter, S., 2011. Immigration and the Neighborhood. *American Economic Journal: Economic Policy*, 3(2), pp.169-88.

Stillman, S. and Maré, D., 2008. Housing Markets and Migration: Evidence from New Zealand, Wellington. *Motu Economic and Public Policy Research*, Working Paper 08/06, pp.1-45.

Taylor, S.J., 2014. *Buying Real Estate as an Immigrant to the U.S.* [online] US News. Available at: <http://money.usnews.com/money/personal-finance/articles/ 2014/11/04 /buying-real-estate -as-an-immigrant-to-the-us> [accessed 29 January 2017].

United Nations, 2016. *International Migration Report 2015*. [online] Department of Economic and Social Affairs - Population Division. Available at: <http://www.un.org /en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2015.pdf> [accessed 29 January 2017].

Vigdor, J.L., Calcagni, G. and Valvekhar, M., 2013. *Immigration and the Revival of American Cities: From Preserving Manufacturing Jobs to Strengthening the Housing Market*. [online] Washington, D.C.: Partnership for a New American Economy. Available at: <http://www.renewoureconomy.org/wp-content/uploads/2013/09/revival-of-american-cities.pdf> [accessed 24 March 2017].

White, G., 2015. *Can Immigrants Save the Housing Market?* [online] Available at: <http://www.citylab.com/housing/2015/01/can-immigrants-save-the-housing market/ 384357/> [accessed 14 March 2017].

Zandi, G., Mahadevan, A., Supramaniam, L., Aslam, A. and Theng, L.K., 2015. The Economical Factors Affecting Residential Property Price: The Case of Penang Island. *International Journal of Economics and Finance*, *7*(12), pp.200-210.

Zhu, H., 2006. The Structure of Housing Finance Markets and House Prices in Asia. *BIS Quarterly Review*, December, pp. 55-69.