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Immigrants' impact on financial market – European countries' evidence*

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Abstract

The aim of this research is to answer to the question of whether immigrants' inflow might influence financial markets. The qualitative analyses of descriptive statistics and immigrants' nationality allowed us to ascertain which the most preferred immigrants' destinations are across the European countries, but also to get a picture of the countries from which most immigrants come from. Then, using annual data ranging from 1998 to 2014 for 20 European countries, a three-fold analysis was performed as to unveil complementary statistical links between immigrants' inflow and several financial sector specific indicators. The analysis comprehensively considered the main components of the financial sector, namely the banking sector, the insurance one, the capital market and private pensions. First we relied on the correlation and causality approach, complemented by the use of a panel regression with fixed effects. According to the country by country investigation, the information provided by the descriptive statistics, by the causality test and by the size of the fixed effects estimated through panel regressions shows that Germany clearly detaches itself among the other European countries considered. This most wanted destination among European countries and the second most preferred in the world, records the most pronounced and persistent influence of the number of immigrants on several financial sector features. From the standpoint of the financial sector, the most influenced by immigrants' inflow, it has been found that bank specific variables are on the top. This result confirms both economic intuition and practice, because immigrants are more prone to use basic banking services rather than invest on the capital market or sign life and non-life insurance contracts.

Key words: *immigration, financial access, financial system, causality, panel data*

JEL classification: *C23, F22, G20*

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1. Introduction

Existing economic literature investigates to a larger extent the effects exerted by immigrant population on several macroeconomic variables, such as economic growth, inflation rate, or the labor market, in terms of wage and employment rates' distribution. However, recent studies addressing the broad topic of immigrants' financial market participation are scarce, covering only few countries and investigating some research assumptions.

Anderloni and Vandone (2008) proposed an explanation for the scarcity of the literature in this field. Either the studies do not disentangle between immigrants and native population, or there is little attention paid to immigrants' specific financial needs. The latter can be explained by low levels of immigrants faced by some countries, and therefore by a still weak demand for dedicated financial services.

Our paper adds to the current literature on immigration in various ways. To our knowledge there is no previous study assessing the contribution exerted by immigrants' inflow to the financial sector of host countries. We believe it is a topical subject for policymakers and practitioners in the financial industry, as more and more European countries have become recipients of increasing inflows of immigrants. The main hypothesis of the research is that the inflow of immigrants affect mainly banking sector specific indicators and these indicators are related to deposits or loans.

Secondly, the overwhelming part of research papers focuses on the U.S. experience. The very few papers addressing European countries (usually the UK, Germany, Italy and Spain) aim at investigating immigrants' saving and borrowing behavior, the borrowing costs they face compared to native population, or accessibility to basic banking services. No study follows a macro perspective, by analyzing financial system specific indicators and the impact exerted by immigrants on their subsequent evolution. Hence, the novel research direction to be explored in this paper relies on analyzing the effects of increasing inflow of immigrants on the host country's financial system. We relied on a broad range of indicators meant to cover all financial system's segments, namely the banking system, the capital market, the insurance sector and private pensions.

Third, our study comprises all the 20 European countries in the membership of OECD, which greatly adds to the comprehensiveness of the analysis and allows making comparisons between them.

Fourth, previous studies employ data collected by means of surveys and interviews and usually they cover a shorter time frame. Instead, we rely on official data regarding the number of immigrants established in a given country, extracted from OECD database, covering a time frame of seventeen years, from 1998 to 2014. The goal of our research is to analyze from various statistical standpoints the relationship

established between financial sector indicators and the evolution recorded by inflows of immigrants into European countries.

The paper has the following structure: the second section performs an overview of existing studies related to immigrants' participation to the financial system and synthesizes the manner financial services have been adapted so as to comply with immigrants' specific financial needs.

The third section explains the methodological issues, while the fourth one presents the variables employed and the results of the three-fold analysis on the relationship between immigration and financial sector indicators. The fifth section emphasizes the economic significance of the results, while the last section concludes and provides some further research directions as well as some policy recommendations.

2. Literature review

The topic of immigrants' participation on the financial market has been mainly addressed in research papers focused on U.S. and to a scarce extent in papers covering European countries. The research findings are mainly based on qualitative research performed through interviews or surveys, sometimes targeted to particular regions, cities and nationalities of immigrants and often focused on specific issues of financial access, mainly related to remittances and microcredit.

The few existing studies targeting the European countries (Aro and Bornati, 2004; Hayen et al. 2005; Aktinson, 2006; Anderloni and Vandone, 2008), exhibit a common denominator in terms of main barriers or difficulties immigrants encounter in having sound access to financial services. These obstacles are the language problems encountered when asking financial advice from banks' staff and difficulties in finding out official financial information and in understanding the provisions of various financial agreements.

Atkinson (2006) studied immigrants living in UK and found that the main drivers of saving behavior are personal choice, past financial behavior and current circumstances related to income level, job stability. In terms of borrowing behavior, they request the design of affordable tailored credit for immigrants so as to take into account that they don't have a credit history and usually earn low incomes in the early periods of stay in the host country.

Another study (Aro and Bornati, 2004), addressing the same topic but for immigrants living in Spain, has outlined a peculiarity of Spanish savings banks related to developing and implementing various facilities for the benefit of immigrants, such as dedicated bank branches, forms of virtual remittances and hiring of ethnic personnel so as to overcome the language barrier.

Diaz-Serrano and Raya (2011) have examined too the financial behavior of immigrants established in Spain, but from the standpoint of the interest rates charged on mortgage loans. They found the presence of discriminatory practices against immigrants, almost two thirds from the interest rate level charged from immigrant borrowers being attributed to discriminatory treatment.

A similar research direction has been followed by Albareto and Mistrulli (2011), by targeting immigrants living in Italy, which developed their own small business. By jointly analyzing the level of interest rates charged by banks from micro firms run by immigrants against the levels charged from firms run by native entrepreneurs, they found that immigrants' interest rates exceed the ones for natives with around 70 basis points. Interestingly, when discriminating between first and second generation of immigrants, it seems that the interest rate gap lowers, in direct relation with the lengthening of the stay period and credit history.

According to De Matteis (2015), immigrants established in Italy regularly use current accounts and prepaid cards with IBAN or postal prepaid cards which allow users to perform payment services without being linked to a current account. Immigrants' relationship with Italian banks has evolved from a place to hold savings and obtain loans to a consultant and advisory role for financial needs.

Hayen et al. (2005) performed an analysis based on telephone surveys and interviews with Turkish immigrants living in Germany. The results indicated that immigrants do not use to rely on bank saving, and the level of remittances send to the home country is small, but they depict a high affinity to purchasing real estate assets in Germany. They also use insurance products for legal protection or accident. The second generation of immigrants shows a higher interest in Sharia compliant financial products, an area which is underdeveloped or even inexistent in most European countries.

A more recent study targeting too the Turkish immigrants established in Germany belongs to Heinen et al. (2015) and shows mixed results regarding the risk tolerance exhibited by first-generation of immigrants. The empirical findings show that immigrants are more risk averse regarding general risks, but risk friendly when it comes to bearing risks assigned to financial investments. Authors' conclusion is that immigrants' risk profiles are subject to changes over time, especially in the case of second-generation immigrants, and banks have to keep pace with these changes, to understand the evolution of risk profiles and to develop suitable investment proposals tailored to immigrants' needs and expectations.

An interesting and singular approach belongs to Fuchs-Schundeln et al. (2017) which tested the assumption of whether cultural factors in the country of origin are still present in the financial behavior of second-generation immigrants. They relied on an epidemiological approach, based on data collected from surveys, and tested this assumption distinctly for immigrants living in Germany and for those in UK.

The findings indicated the presence of a cultural effect, materialized in a significant relationship between the saving behavior of second-generation immigrants and the one exhibited by individuals in their home country. In addition, for both Germany and the UK the main cultural motives at the root of the saving behavior are the desire for accumulation of wealth and money and the attitude towards thrift.

The authors Barcellos et al. (2012) investigated the features of the financial literacy depicted by immigrants living in U.S., as well as the potential barriers faced when using financial services. In comparison with native population, immigrants are more likely to be unbanked, as they usually don't rely on savings accounts, credit cards and are reluctant in applying for retirement savings programs or private pension funds, as well as investing on the capital market, by purchasing stocks or bonds. There is evidence that most immigrants tend to save by avoiding the banking system, by simply holding large amounts of cash which, however, do not provide them any return or protection against the erosion of their purchase power (against inflation). The more sophisticated is the financial product the lower its usage by an immigrant person. Another finding of the authors shows a positive relationship between immigrants' level of income and education skills and confidence in using financial products. Some of the barriers identified by the authors, who prevent immigrants' financial participation, are represented by low financial literacy and understanding of financial products features, inappropriate language skills which create language barriers in discussing with bank officers, the mistrust in financial institutions irrespective they are located in the home or host country, or incertitude regarding the length of stay in U.S.

By analyzing immigrants' participation to the U.S. financial market, the authors Ballard et al. (2016) emphasized that new comers have first to learn and understand the financial services' features from the host country. Immigrants' attitude on financial institutions largely differs due to personal experiences from their home countries (sound and resilient banks, mismanaged or corrupt banks, or predominantly cash-based markets), which might act as impediments of their future financial behavior. The authors suggest that immigrants should use financial products so as to increase their financial protection. It has been observed a positive relation between the immigrants holding bank accounts and the homeownership status. Also, younger, higher income, well-educated and skilled immigrants tend to rely more on savings accounts and credit cards. The authors advocate for the provision of culturally tailored financial products and services, to stimulate lending and saving.

Another research direction has been investigated by Bohn and Pearlman (2013), which focused on whether immigrants' concentration in enclaves might explain their use of banking products. Their findings indicate that a rise with 10% of the number of immigrants located in the same region or enclave triggers a decrease with 2.4% of the likelihood that immigrants hold a bank account, due to the existence of an alternative, informal financial mechanism represented by immigrant

communities. The authors point out that these results are of importance for policymakers and financial institutions in order to stimulate the use of formal banking products by immigrants and subsequently their wealth accumulation.

Bloomberg and Mintz (2013) performed an in-depth survey of three main groups of immigrant population living in the same enclave, namely New York City to ascertain their financial behavior and needs so far unaddressed by financial institutions. Low and medium-income immigrants face severe lack of access to financial services tailored to their needs, with negative impact on the financial protection of their earnings and prospects for homeownership. Some of the reasons provided by survey respondents for not holding a bank account relate to the lack of enough money to be kept as a minimum balance in the account, high fees, lack of some data needed for opening an account such as passport or social security number, language barriers because banks' employees do not speak the native language of the immigrant. All respondent communities declared they use to save money, although most of them through informal savings rather than bank saving.

A comprehensive study regarding immigrants' homeownership and access to mortgage loans meant to facilitate the purchase of a house has been elaborated by Del Rio (2010). The longer the period of stay in the host country, the higher the likelihood that immigrants purchase their own homes. The obstacles identified by the author which impede the buying of a house comprise the lack of housing affordability in cities, the discriminatory attitude of home sellers and real estate professionals regarding immigrants' ethnicity. As regards immigrants' access to mortgage loans, the author mentions the 2000' U.S. initiative of assigning individual taxpayer identification number to immigrants willing to open a bank account or to apply for a loan, even if lacking the appropriate documentation so as to request a traditional mortgage. However, some financial institutions were reluctant in providing mortgage loans to immigrants due to concerns regarding regular customers' misconceptions about immigrants, but also to banks' exposure to criminal charges or to difficulties in loan repayment in the case an immigrant borrower would be deported or detained. Currently, only small banks and credit unions still provide this type of loan.

Some studies argue that individuals' ownership of financial assets indicates a more sophisticated behavior in terms of economic participation. Carroll et al. (1999) investigated U.S. immigrants' saving and investment patterns and found that over a period of 25 – 30 years it recorded a reverse. If initially immigrants used to save less, the increased economic participation into the host country stimulated their access to investments and saving behavior. The study performed by Chatterjee (2009) found that the likelihood that U.S. immigrants own financial assets such as stocks or mutual funds increases with the level of income earned, risk forbearance, educational attainment and length of stay in U.S. In addition, the authors Chatterjee and Zahirovic-Herbert (2014) analyzed the reasons why immigrants do not

apply for investments in financial assets, from which we mention low access on the market, less investment opportunities tailored for non-native people, misunderstanding of information regarding financial investments. To these it can be added various socio-demographic factors such as age, education, religion and income. Living in immigrant communities decreases the likelihood of using financial assets, even of the basic banking products. Another factor is represented by the country of origin. Findings show that immigrants from Europe or Canada are more concerned on holding financial assets than those from South America and Mexic.

A singular attempt in the literature devoted to studying the relationship between immigrants and financial services belongs to Anderloni and Vandone (2008), which have identified five successive phases of a migrant's life cycle, each phase triggering its own financial needs, namely:

i) the initial settlement into a host country, when money earned is preponderantly used for survival purposes or for repaying the borrowed amounts obtained in order to facilitate migration;

ii) the legalization phase, characterized by obtaining a regular residence permit and a stable job. The interaction with financial institutions is related to saving, transferring amounts of money to host country or applying for micro-credits or personal (consumer) loans;

iii) the stable settlement phase is peculiar to a greater economic and social integration into the host country. In addition to the financial services relied on in the preceding stage, immigrants are now looking also for mortgage loans or business loans, non-life insurance;

iv) the consolidation phase, when the immigrant decides to permanently stay in the host country and his family joins him, witnesses the appearance of more sophisticated financial needs similar to those of native inhabitants. The levels of remittances significantly drops, while increasing the reliance on investment and asset management, life and non life insurances, contribution to pension schemes, various loans and mortgages, electronic payment services;

v) further stages, represented by second and subsequent immigrant generations. This phase has been experienced only by few countries exhibiting a standing, sustained tradition of incoming migrations (Germany, France and UK in Europe, the US).

The above mentioned authors proposed to mitigate the existing gap between immigrants and financial institutions by means of a supply – demand qualitative analysis. Limited financial access can be explained, on the demand side, by means of banks' inability to meet immigrants' financial needs and also by the root causes which impede sound access to financial services usage, namely cultural and

linguistic factors, psychological factors, lack of knowledge on procedural aspects or assessments of cost. On the supply side, existing banking products and services might not be appropriate for immigrants' specific financial needs.

Singer and Paulson (2004) emphasized the importance and further implications of increasing immigrants' access to financial services, including savings and checking accounts, business loans, and home mortgages, both for their current well-being as well as for the successful incorporation of second generation immigrants into the host country. It is a long-lasting, reciprocal process as both financial institutions and immigrants have to evolve and to adapt, the final goal being the achievement of greater financial market participation of immigrants. The most active in this regard have been the community development organizations which noticed the potential of immigrants in helping them fulfilling some pre-established goals, such as enhancing local economic development, entrepreneurship and start-ups initiatives.

Paulson et al. (2006) observed that in countries with large inflows of immigrants there is a pronounced tendency for both small and large size banks to place immigrants at the core of their marketing strategies. Smaller banks respond in a faster manner to new customers' financial needs meanwhile larger banks have the potential to attract more customers.

Immigrants' financial needs act as a catalyst for financial services innovation. In addition, they bring ongoing challenges for banks which have to adapt and reconfigure their range of products, as well as the communication and marketing strategies and policies in order to facilitate immigrants' access to financial services.

This idea has been argued by several authors. Anderloni and Vandone (2008) identified two main areas in which banks can implement changes, namely: i) innovation in customer relations, meant to create and further strengthen the relationship with immigrants, by means of multi-language advertising and documents, multi-language speaking staff and dedicated branches; and ii) product innovation, by providing financial products and services particularly designed to meet immigrant needs. When designing a financial product or service, banks have to be aware of the manner immigrants' needs shift over time, from basic services to investment ones.

Banks' customer centricity has to be adapted so as to reconcile also immigrants' financial needs. Patraporn et al. (2010) suggests that banks have to improve information transparency and communication skills, by acting as advisors and providing counseling services tailored to immigrants. Bank officers have to highlight that immigrants' financial information and loan application will be confidential, so as to increase trust and accessibility of financial services.

Heinen et al. (2015) warn that in order to maintain and improve the share of retail banking activities, banks have to provide immigrant customers a broader range of specially tailored financial products, accompanied by multilingual bank staff,

multicultural marketing and appropriate advisory services to account also for immigrants risk preference.

In Canada the growing inflow of immigrants is perceived by banks as an appealing potential customer. In this respect, they focus on expanding their retail divisions by providing immigrants with diversified financial services, such as: unsecured credit cards, multilingual banking services, periods during which no-fee is charged for their banking operations and help in sending money to their home country (Morison, 2012).

Deutsche Bank Research paper cites Dohms and Schreiber (2015) which document on the emergence in Germany of financial services meeting religious criteria. It is the case of the first Islamic bank being authorized in early 2015 by the German supervisory authority BaFin which will conduct its activity in accordance with the principles and rules of Sharia law.

De Matteis (2015) observes the presence of four approaches implemented by Italian banks with regard to immigrants. The first approach belongs to apparently non-responsive banks which choose not to provide specific products for immigrants. The second approach is characterized by a reshaping of some traditional financial services to immigrants' needs, in terms of affordable costs and conditions, simpler and multi-lingual information and specially trained staff. The third approach applies the principle "banks following immigrants". This means that foreign banks open bank branches in the Italian regions most inhabited by immigrants so as to better serve them. The fourth approach is represented by the launch of new banks specially created for immigrants or special bank branches providing financial services exclusively for immigrants.

Two decades ago, the first ethnic banks emerged in the USA that focus on various ethnic groups and provide them with various financial opportunities by taking into account their financial behavior, culture issues and income level. Banks willing to achieve an ethnic orientation have to adapt not only the features of the financial services provided, but also their marketing and communication strategy (Shanmuganthaan et al., 2004). Armstrong and Haiss (2007) observed that banks in the U.K are more concerned about the financial needs of Asian and Muslim immigrants, as they hold increasing share in the total number of immigrants living in U.K. The solution identified by U.K banks relates to hiring people belonging to the ethnic communities banks aim to serve. Specifically, banks hire tellers, financial consultants, and branch managers in order to increase ethnical customers' psychological comfort and level of confidence in the financial services and products being offered.

3. Methodological approach

The main research assumption of our study is to empirically investigate whether there is a significant relationship between financial sector indicators and the evolution recorded by immigrants' inflows into European countries. In other words, we examine whether the increasing immigrants' preference for living and working in a European country exerts an influence on the subsequent development of the host country's financial sector.

We perform a three-fold analysis to shed light on complementary statistical information. First we compute the correlation matrix to assess the strength and direction of the linear relationship between pairs of variables. Secondly, the Granger causality test adds another dimension of historical correlations established between the number of immigrants and each of the financial sector specific indicators, in terms of prior change in one variable that is followed by changes in other variables.

According to Brooks (2008, p.312), one shouldn't interpret the presence of causality between pairs of variables as "movement in one variable that physically cause movements in another variable" but as "chronological ordering of movements in the series". Diebold (2001, p. 254) explains that, when employing a causality test, the findings expressed briefly in a short statement "x causes z", should be read as "x contains useful information for predicting z (in the linear least squares sense)".

Third, the most suited method for the purpose of our analysis consists in performing univariate panel data regressions with fixed effects comprising the number of immigrants (in natural logarithm) as explanatory variable and one financial sector specific indicator as dependent variable. The spatial dimension is represented by annual data for 20 European countries members of the OECD, while the temporal dimension comprises the period ranging from 1998 to 2014.

The baseline panel regression model looks as follows:

$$\text{Financial sector variable}_{it} = \sum \beta M_{it} + \mu_i + \varepsilon_{it}$$

where

$i = 1,2,\ldots.N$ represents the number of countries in the sample

$t = 1,2,\ldots.T$ is the time period

financial sector variable $_{it}$ = the dependent variable, represented by specific indicators for the country i at time t

M_{it} = country-specific inflows of immigrants

μ_i = countries' fixed effect

ε_{it} = the error term

4. Empirical data and analysis

In the selection process of explanatory variables we didn't employ any control variable because socio-demographic factors such as immigrants' age or gender have not been available for the entire time period considered, or for all the countries in the sample. Other control variables (immigrants' education, income level, marital status) were simply lacking from international institutions' main databases. The description of variables that have been used in the study, as proxies for the different dimensions of the financial sector, namely banking system, capital market, insurance and pension funds can be found in table A1.

4.1. Descriptive statistics

As the study gravitates around immigrants, it is of interest to analyze several descriptive statistics, computed for each European country in the sample, to obtain a first insight on the immigrants' inflow time series features during the time frame 1998 – 2014 (see table 1).

Time series central tendency can be depicted by computing the mean value of the 17 years considered. The lowest 17 years-mean belongs to Slovakia (1.84), followed by Finland and Luxembourg with around 2.66. Thus, these countries witnessed the smallest immigrants' inflow. At the opposite is Germany with the highest mean value (6.55), suggesting that this country has been the main destination of immigrants during the time horizon considered. It is important to mention that the 17 years included in this analysis represent the longest time record related to immigrants' number that we've found by comparatively searching different international databases. Other preferred destination countries are UK (5.92), Spain (5.87) and Italy (5.65).

Other two summary statistics are represented by the minimum and maximum values of the number of immigrants, in natural logarithm. The biggest the difference between them, the broadest the fluctuations recorded by the variable. The highest values of the maximum level of the number of immigrants (in logarithm) are recorded by Germany and Spain (around 7.20 – 6.82), closely followed by Italy and UK with 6.22. Two Northern Europe countries (Denmark and Finland) and 4 central Europe countries (Hungary, Luxembourg, Poland, and Slovakia) depict the lowest values of their upper boundary. In terms of the minimum values, the smallest number of immigrants (in logarithm) is 1.44 and belongs to Czech Republic, followed by Poland and Portugal.

Standard deviation is an important metric as it provides supplementary information on the dispersion of the observations in the sample around their mean. A small value indicates a pattern of homogeneity, as the time series' values are closely related to their mean. It is the case of France and Hungary with the smallest standard deviation

(0.19), but also of several other EU countries showing subunit values (Austria, Germany, Luxembourg, Netherlands, Switzerland and UK). These countries witnessed a relatively slow variation of the inflow of immigrants during the entire 17 years considered. By looking at the highest values of standard deviation we obtain a snapshot of countries that have registered ample fluctuations one year from another in terms of the number of immigrants, namely Czech Republic (0.91), Spain and Portugal (0.71). Although these three countries are not included in the top of immigrants' preferred destinations, the flow of immigrants depicted the widest variation.

Table 1: Main descriptive statistics for LN (inflow of immigrants) variable

Country	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera probability
Austria	4.54	5.04	4.08	0.25	0.17	2.73	0.94
Belgium	4.44	4.86	3.93	0.30	-0.13	1.67	0.52
Czech Rep.	3.36	4.63	1.44	0.91	-0.74	2.51	0.43
Denmark	3.29	3.89	2.91	0.30	0.46	1.93	0.49
Finland	2.65	3.17	2.07	0.39	-0.07	1.52	0.46
France	4.87	5.12	4.42	0.19	-1.06	3.40	0.19
Germany	6.55	7.20	6.33	0.25	1.42	3.86	0.04
Hungary	3.10	3.62	2.78	0.19	1.01	4.92	0.06
Italy	5.65	6.21	4.71	0.36	-0.85	3.78	0.29
Ireland	3.72	4.49	3.08	0.44	0.30	2.18	0.70
Luxembourg	2.66	3.05	2.36	0.23	0.26	1.73	0.51
Netherlands	4.52	4.94	4.15	0.24	0.03	1.93	0.66
Norway	3.74	4.26	3.24	0.40	0.08	1.24	0.33
Poland	3.39	3.85	1.65	0.55	-2.04	6.83	0.00
Portugal	3.49	5.02	1.87	0.72	-0.28	3.69	0.76
Slovakia	1.84	2.80	0.88	0.64	0.01	1.74	0.57
Spain	5.87	6.82	4.05	0.71	-1.07	3.98	0.14
Sweden	4.12	4.66	3.54	0.37	-0.18	1.52	0.44
Switzerland	4.74	5.06	4.28	0.25	-0.14	1.67	0.52
UK	5.92	6.22	5.48	0.24	-0.61	1.83	0.36

Source: authors, using Eviews

To describe the shape of time series distribution one can rely on other two statistics, namely skewness (coefficient of asymmetry) and kurtosis. The perfectly symmetric distribution of the number of immigrants (in logarithm) has been recorded in Slovakia and Netherlands (almost 0.00). The most asymmetric distribution is exhibited by Poland (-2.04), indicating negative skewness, or a longer tail towards left meaning that smaller values predominate in the sample considered. Economic literature states that kurtosis levels below a threshold of 3 indicate that the time series' distribution is flatter than a normal one. Hence, 13 out of 20 countries exhibit a platykurtic distribution whose main feature is that the likelihood for the

occurrence of extreme values (either minimum or maximum values) is smaller than in the case of a normal distribution. According to the statistical theory, a skewness equal to zero and a kurtosis of 3 indicate a normally distributed time series. This finding is reinforced by the Jarque-Bera normality test, which assesses whether the empirical distribution can be approximated by a normal one. The higher the probability assigned to Jarque-Bera statistic, the more pronounced is the resemblance to the normal distribution. With a probability of 94%, Austria's time series follows a normal distribution.

Raw data on the number of immigrants into a host country can be further disaggregated based on the nationality criterion, so as to obtain a snapshot of the countries from which most immigrants come from. This qualitative analysis has been performed for the six European countries whose number of immigrants exceeded 150,000 in 2014 (the latest data available). Figures A1 – A6 summarize the countries of origin and the number of immigrants.

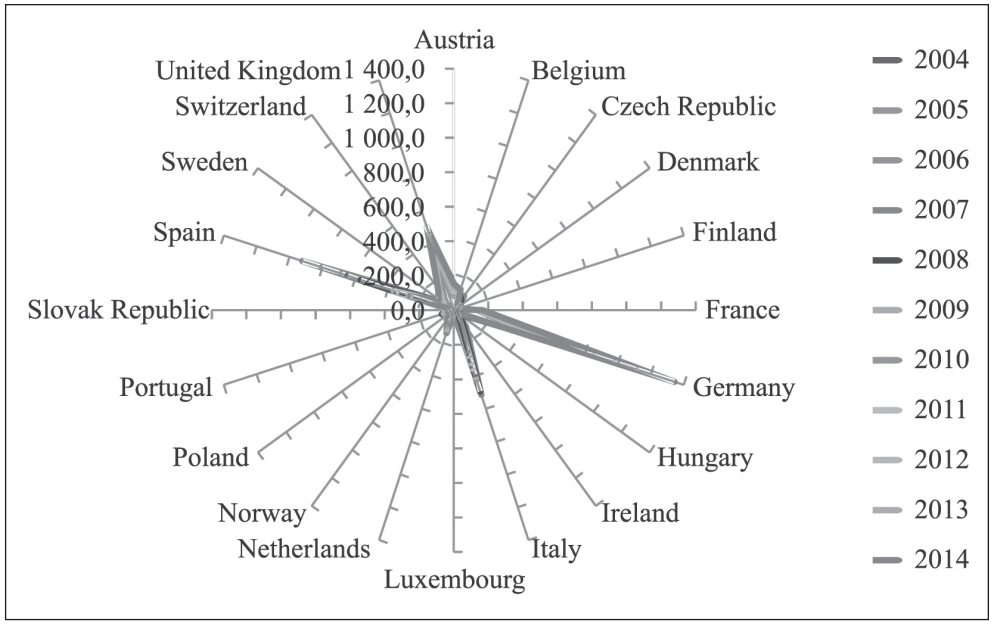
It has to be mentioned that Germany holds the largest number of immigrants, followed by UK. A publication issued by the International Organization for Migration (2015) meant to provide a detailed picture of major migration trends worldwide has stated that, according to end-2015 data, Germany became the second most popular destination for international immigrants globally, the first position being held by the United States and the third by Russia.

China is the only country whose inhabitants are present in each of the six countries considered, but mainly in UK, Germany and Italy. Apart from France, Romanians are present in all five countries. The immigrants living only in Germany come from Bulgaria, Croatia, Serbia, Syria, Greece and Bosnia and Herzegovina. Those living only in UK come from France, Lithuania, Portugal, Australia, Canada, and India. Immigrants preferring to live only in Spain come from UK, Colombia, Dominican Rep., Venezuela, Honduras and Ukraine. Italy is a destination for inhabitants from Albania, Moldova, Bangladesh, Egypt, Philippines, Nigeria and Sri Lanka. From the six countries analyzed, France is a destination chosen exclusively by inhabitants from Algeria, Cameroon, Cote d'Ivoire, Congo, Tunisia, Mali and Haiti. To sum up, the six most preferred European countries gather foreign inhabitants from 28 non-European countries. In terms of the number of immigrants living in a particular country, the first place is hold by Syria, followed by India, while Algeria, Bosnia, China, Morocco, Russia and Turkey are represented by around half of the preceding countries' size of immigrant population.

This path of increased heterogeneity regarding the nationality of immigrant population living in European countries is a dominant feature of the last decade. Anderloni and Vandone (2008) explain that European countries exhibiting recent migration flows are experiencing greater variation in terms of immigrants' nationalities, coming from Asia, Africa, Eastern Europe and Latin America.

Consequently, the integration or assimilation of immigrants exposes the host country to various economic, social or financial challenges, which are different between countries such as the United Kingdom, France and Germany that have experienced continuous migration flows for many decades, and those countries with more recent and varied migration flows, such as Italy and Spain.

Figure 1: Time evolution of the number of immigrants



Source: authors, based on data collected from OECD International migration outlook, 2016

Complementary information can be obtained by analyzing the path recorded by the number of immigrants during the 17 years considered, for each country in the sample (see Figure 1).

During the 17 year-time frame, Germany persistently recorded the increase of immigrants' inflows, followed by UK with a slower pace of growth. At the opposite side are Spain and Italy which witnessed a progressively decrease of immigrants' number, the remaining countries recording quite steady levels.

4.2. Econometric analysis

In the following we have assessed the relationship between immigration and financial sector indicators by means of a correlation, causality and panel data approach. Table A2 (see the Appendices section) synthesizes the results of the correlation analysis.

The statistically significant results of Granger causality tests have been summarized in Table 2, for each country in the sample. An increase in the number of foreign population is susceptible to trigger a subsequent change on six financial sector variables in the case of Belgium, and on five variables in the case of Finland, Italy and Spain. At the opposite are Slovakia and Luxembourg with no statistical significant causality. Bank non-performing loans are the variable mostly impacted by immigrants' inflow, although the causality analysis cannot state the direction of this relationship (positive or negative).

Another unilateral causality relationship is established between the set of financial sector variables and the immigrants' inflow. The interpretation is straightforward: an initial change in the level of these variables may trigger effects on the number of foreign population in the host country. In Germany changes in 12 out of 15 financial sector variables are susceptible to be followed by changes in immigrants' level. On the second place lies Luxembourg, with 7 out of 15 variables having potential to further influence the number of immigrants. In a cross-country approach it seems that private pensions' assets and the level of remittances paid are the ones which generate most impact on the immigrants' inflow.

Table 2: Pairwise Granger causality test

Country	Variables														
	House-holds' total deposits	Consum-ption loans' growth rate	Bank nonper forming loans	Loan-to-deposit ratio	Composite cost of borrowing	Herfindahl index	Number of bank employees	Number of bank branches	Credit by financial sector (% of GDP)	Invest-ment fund share s/units	Private pensions' assets	Health insurance premiums to GDP	Life insurance premiums to GDP	Household equity in life insurance /pension funds reserves	Remittances paid
Austria	→		⟺									←	→	→	
Belgium		←	←	←		←	→				←		←		
Czech Rep.						⟺	→	⟺	→	←	→	←			←
Denmark			←				←	←	⟺		→		→		→
Finland			←	←		←		←			→		←		→
France			→	→	←		←			←			→		→
Germany	→	→	→		←	→	→	→		→	→	→	→	→	→
Hungary			←								→				→
Italy			←		←		←			←				←	
Ireland	→	→				←		→	←				←	←	
Luxembourg	→		→		→					→	→			→	→
Netherlands			←		←		→	←	→		→	→		←	⟺
Norway									←						→
Poland			←												→
Portugal	→	⟺			→			←						→	
Slovakia						→			→						
Spain	←		⟺	→	←	←			⟺	→		←		←	→
Sweden			→			←	←		←		→				
Switzerland									→		→	←	→		
UK							←	→	←						←

Source: Authors, using Eviews

Legend:

⟺ bilateral Granger causality

→ unilateral causality: the dependent variable Granger causes the inflow of foreign population

← unilateral causality: the inflow of foreign population Granger causes the dependent variable

The third stage of the empirical analysis comprises the testing of univariate panel data regressions with fixed effects for a time period covering 1998-2014. We relied on a fixed effects model rather than on OLS model because we wanted to control for countries' unobservable features which may trigger potential endogeneity problems. The dependent variable is represented by a financial sector indicator while the regressor is the natural logarithm of immigrants' number.

Table 3: Summary of panel regressions' results

Dependent variable	Independent variable	Coefficient	Std. Error	t-Statistic	Prob.
Households' total deposits, as growth rate	Inflows of foreign population	4.074899	2.441505	1.669011	0.0975
Loans for consumption granted to households, as growth rate		6.012257	2.737424	2.196319	0.0307
Investment fund shares/units		-0.2282	0.095185	-2.39743	0.0188
Net equity of households in life insurance reserves and in pension funds reserves		-0.11405	0.054753	-2.08301	0.0409
Herfindahl index for credit institutions' total assets		0.008857	0.002407	3.679978	0.0003
Bank nonperforming loans to total gross loans (%)		-2.89351	0.524374	-5.51802	0
Health insurance premiums to GDP		0.189828	0.090757	2.091602	0.0377
Private pensions' assets		0.738735	0.16165	4.569956	0
Paid remittances' level		0.789424	0.079173	9.97085	0

Source: Authors, based on Eviews computations

All variables are stationary in the first difference. It has been performed 14 univariate panel regressions from which only 9 depict statistically significant relationship between dependent and explanatory variables (see table 3).

5. Results and discussion

The correlation matrix shows that remittances (money sent back by immigrants to their home country) exhibit a strong and positive correlation with the inflow of immigrants for 9 out of 20 countries. Other variables strongly synchronized with the inflow of immigrants are private pensions' assets and net equity of households hold in life insurance reserves and in pension funds reserves for 8 out of 20 countries, life insurance premiums to GDP and investment fund shares/units for 6 countries.

The second stage of the statistical analysis, related to Granger causality tests, complements the picture. Germany reveals the presence of most causality relations between financial sector indicators and the number of immigrants (13 out of 15), a result which might be considered unsurprisingly given the fact that this country is immigrants' preferred destination and concentrates the largest number of immigrants established here. Germany and Luxembourg exhibit the most unidirectional causality relations which point that a change in financial sector indicators precede changes in the number of immigrants. At the opposite are Belgium, Finland, Italy and Spain depicting most reverse causalities, meaning that a change in the number of immigrants is susceptible to trigger further changes of the selected financial sector indicators.

In terms of the variables employed, it seems that bank nonperforming loans and respectively the level of the remittances paid by immigrants record the most active causality relationships with the inflow of immigrants (in 13 out of 20 countries).

In Austria, Belgium, Denmark, Finland, Hungary, Italy, Netherlands, Poland and Spain the causality test revealed that the number of immigrants (in logarithm) Granger causes bank nonperforming loans. In other words, changes in the number of immigrants precede changes related to banks' portfolio of impaired loans. Excepting Austria and Spain, it is a unidirectional causality, the reverse doesn't hold from a statistical viewpoint.

Causality between the number of immigrants and domestic credit (as % of GDP) is present in 6 countries (Denmark, Ireland, Norway, Spain, Sweden, UK), while the reverse relationship occurs in Czech Republic, Netherlands, Slovakia, Spain and Switzerland. In Austria, Germany, Ireland, Luxembourg and Portugal the chronological ordering suggests that changes in households' total deposits precede those in the number of immigrants.

In Denmark, France, Italy, Sweden and UK changes in the number of immigrants precede those in the number of bank employees. As regards the number of bank branches, it is determined by the inflow of foreign people in Czech Republic, Denmark, Finland, Netherlands and Portugal.

Ten out of 20 countries exhibit unidirectional causality between the amount of remittances paid and the number of immigrants, namely Denmark, Finland, France, Germany, Hungary, Luxembourg, Netherlands, Norway, Poland and Spain.

In terms of capital market indicators, changes in immigrants' number precede changes in the investment funds shares for Czech Republic, France and Italy, while the reverse is valid in the case of Germany, Luxembourg and Spain.

As for the insurance market indicators Italy, Ireland, Netherlands and Spain depict unidirectional causality between the number of immigrants and net equity of

households in life insurance reserves and in pension funds reserves.In Belgium, Finland and Ireland changes in immigrants' number are expected to trigger subsequent changes in the amount of life insurance premiums paid (% of GDP). As regards the amount of health insurance premiums paid (% of GDP), it is determined by changes in the immigrants' number in Austria, Czech Republic, Spain and Switzerland.

The third statistical method, related to panel data regression, indicates that the inflow of immigrants triggers changes in four banking sector specific indicators. Increases in the number of immigrants determine further increases of loans for consumption granted to households (as growth rate). This positive effect has been justified by Laszlo and Santor (2009) by relying on a dominating liquidity demand hypothesis. They also argue that a negative effect of immigrants on loans might rely on a dominating asymmetric information hypothesis, caused by banks' reluctance to provide loans to migrants due to less information regarding their creditworthiness. Increases in the number of immigrants determine decreases of the bank nonperforming loans as share of total gross loans. In other words, the quality of the loan portfolio improves due to the fact that banks are more rigorous in selecting loan applicants as we are talking about a larger mass of potential applicants, composed by both residents and immigrants wanting to settle in the destination country. Another positive relationship is established between the number of immigrants and the growth rate of deposits in the host country, and respectively the Herfindahl index.

There is a negative relationship between the inflow of immigrants and the capital market indicator represented by investment fund shares. This result might be due to the fact that most immigrants come from countries which are characterized by less developed financial systems, mainly bank-based. Consequently, they prefer to save than to invest in financial instruments. Other reasons that impede immigrants' participation on the capital market, by investments in financial assets or funds, are related to uncertainties regarding job, income or period of stay in the host country, or to low access to investment opportunities (Chatterjee, 2009).

From the three indicators representing insurance sector and private pensions' sector, the share of health insurance premiums in GDP and private pensions' assets exhibit a positive relationship with the inflow of immigrants. The level of remittances sent to the home country is also positively related with the increase of immigrants' number, a result that validates economic intuition.

In addition to the information provided by the estimated coefficients, the value of the fixed effects computed for each country brings new insights. The fixed effects indicate the value of the intercept for each country considered. The higher the intercept value, the bigger the impact exerted by inflows of immigrants on a given country's dependent variable. The highest level of the intercept has been recorded by Finland for the Herfindahl index dependent variable, by Italy in the case of nonperforming

loans, by Switzerland in the case of remittances paid, by Netherlands for the health insurance premiums to GDP dependent variable and for Netherlands and Denmark in the case of private pensions' assets. For all the remaining bank-specific and capital market indicators the highest levels of the intercept belong to Germany.

6. Conclusions

The purpose of the paper is the statistical investigation of the potential relationship to be established between the increasing inflows of immigrants into European countries and main financial sector's indicators. Our findings indicate that the inflow of immigrants trigger changes mainly for banking sector specific indicators and these indicators are related to deposits or loans. Insurance sector and private pensions' sector developments are also susceptible to be determined by larger inflows of immigrants, the more so as they envisage a long length of stay in the host country.

There is still a broad, multifaceted field for debates, policy analyses and research regarding immigrants' understanding and access to formal financial products and services, regarding the improvement of immigrants' financial inclusion which is directly connected with their future economic and social resilience. Currently there is no recipe for the design of the most appropriate financial products and services to be provided to immigrant communities, due to a multitude of factors, most of them subjective ones such as ethnicity, religion, previous financial experiences, and education level. In order to address this ongoing challenge it is strongly encouraged the dialogue and coordination among various market players, such as bankers, regulators, immigrant advocates, and community representatives.

After having overviewed several reports and studies related to immigrants' access to financial products, the natural conclusion is that of an obvious gap between the supply and the demand of immigrant targeted financial services. Another conclusion is that financial institutions are not aware of the opportunity brought by immigrants in terms of developing a new, emergent market of financial products. A further direction to explore is whether the intensification of financial education initiatives among immigrants might trigger an increase in the use of formal, basic banking services without being necessary to design new ones, specially tailored for immigrants' needs or expectations.

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Utjecaj imigranata na financijsko tržište na primjeru europskih zemalja

Teodora Cristina Barbu[1]*, Iustina Alina Boitan*[2]

Sažetak

Cilj ovog istraživanja je odgovoriti na pitanje može li priljev imigranata utjecati na financijska tržišta. Kvalitativne analize deskriptivne statistike i državljanstva useljenika omogućile su nam da utvrdimo koja su najpoželjnija odredišta useljenika diljem europskih zemalja, ali i da se dobije slika zemalja iz kojih dolazi većina imigranata. Zatim, koristeći godišnje podatke u rasponu od 1998. do 2014. godine za 20 europskih zemalja, provedena je trostruka analiza kako bi se utvrdile komplementarne statističke veze između priljeva imigranata i nekoliko pokazatelja specifičnih za financijski sektor. Provedena analiza obuhvaća glavne komponente financijskog sektora, poglavito bankarski sektor, osiguranje, tržište kapitala i privatne mirovine. Prvo, primijenjen je korelacijski i kauzalni pristup, nadopunjen regresijskom analizom panel podataka s fiksnim učincima. Prema istraživanju svake zemlje ponaosob, informacije dobivene deskriptivnom statistikom, testom kauzalnosti i veličinom utjecaja fiksnih učinaka procijenjenih pomoću panel-regresijske analize, pokazuju da se Njemačka kao odredište jasno izdvaja među ostalim europskim zemljama. Ovo najtraženije odredište među europskim zemljama i drugo najpoželjnije u svijetu bilježi najizraženije i trajnije utjecaje broja imigranata na nekoliko značajki financijskog sektora. Sa stajališta financijskog sektora utvrđeno je da su specifične varijable bankarskog sektora na samom vrhu s najvećim utjecajem na priljev imigranata. Ovaj rezultat potvrđuje i ekonomsku intuiciju i praksu, jer imigranti imaju veću sklonost korištenju osnovnih bankarskih usluga nego ulaganja na tržište kapitala ili potpisivanja ugovora o osiguranju života i neživota.

Ključne riječi: *imigracija, financijski pristup, financijski sustav, kauzalnost, panel podaci*

JEL klasifikacija: *C23, F22, G20*

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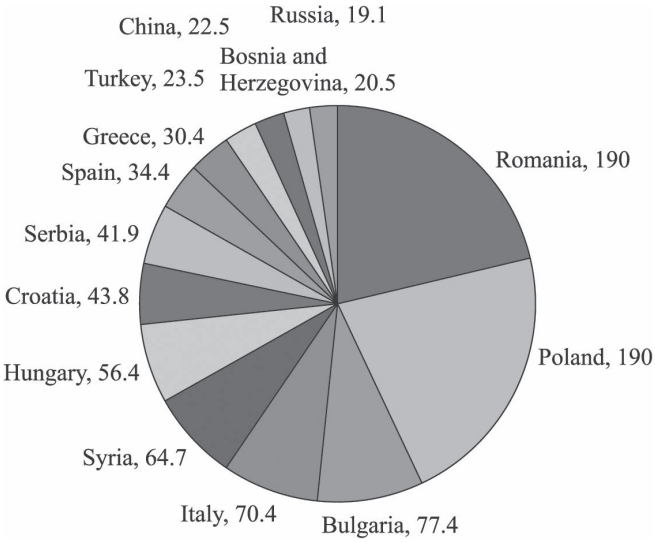
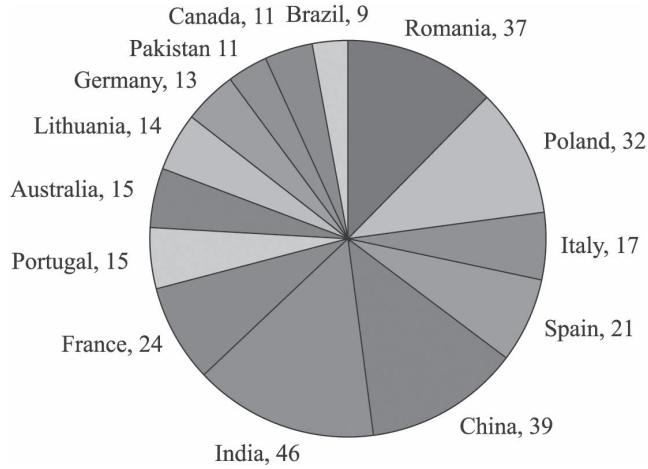
Appendices

Figure A1: Immigrants (by nationality) living in Germany



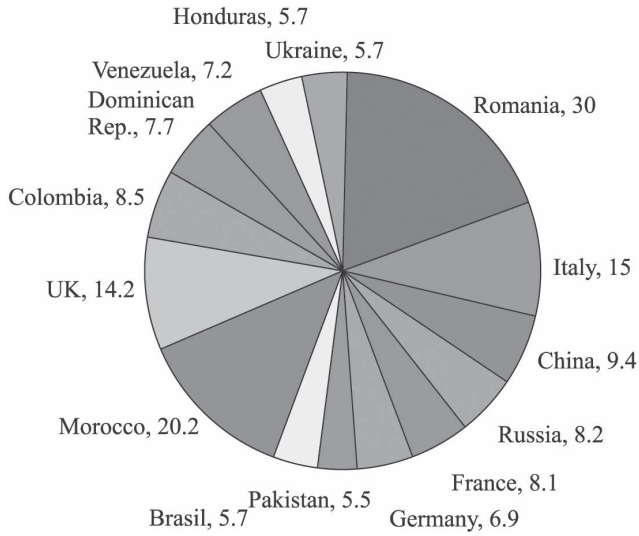
Source: authors, based on data collected from OECD International migration outlook, 2016

Figure A2: Immigrants (by nationality) living in UK



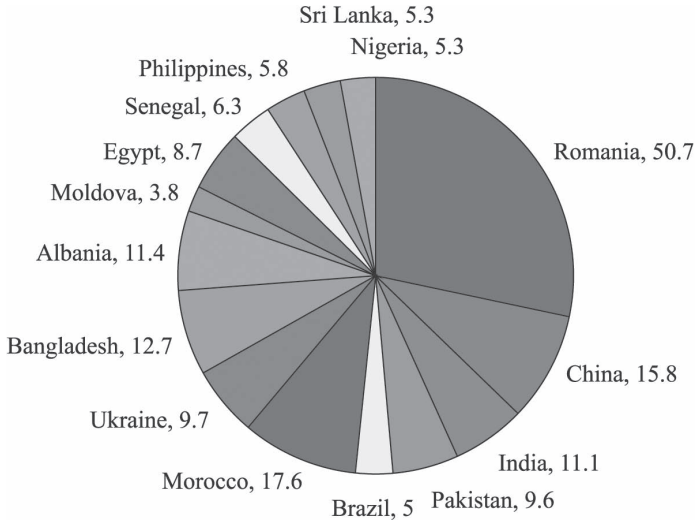
Source: authors, based on data collected from OECD International migration outlook, 2016

Figure A3: Immigrants (by nationality) living in Spain



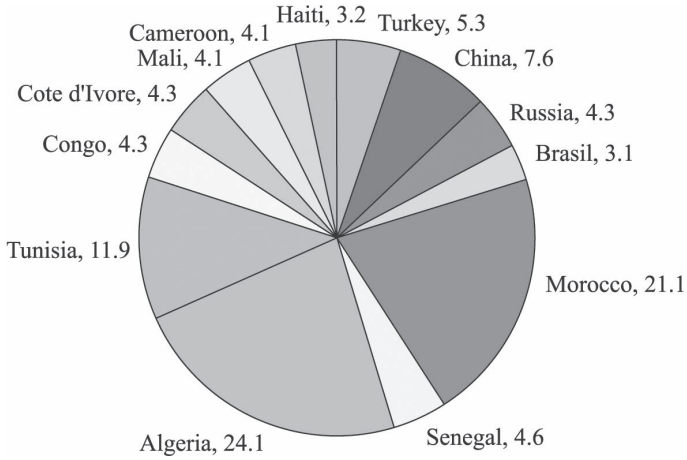
Source: authors, based on data collected from OECD International migration outlook, 2016

Figure A4: Immigrants (by nationality) living in Italy



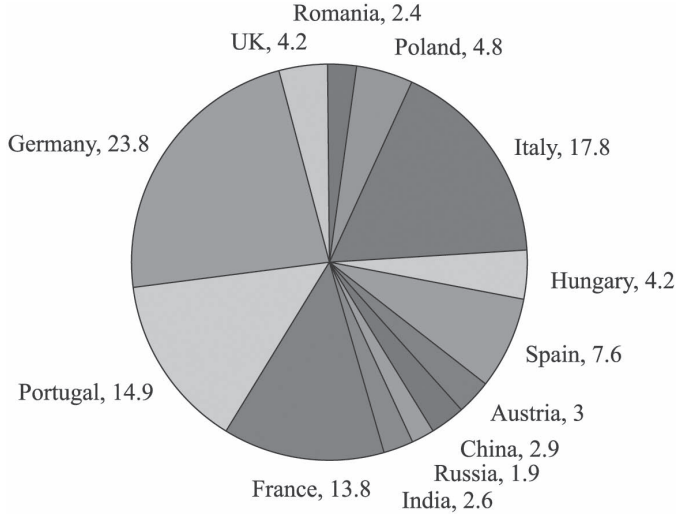
Source: authors, based on data collected from OECD International migration outlook, 2016

Figure A5: Immigrants (by nationality) living in France



Source: authors, based on data collected from OECD International migration outlook, 2016

Figure A6: Immigrants (by nationality) living in Switzerland



Source: authors, based on data collected from OECD International migration outlook, 2016

Table A1: Variables employed and source of data

Variable name	Description	Data availability	Source
No. of immigrants	It refers to people born abroad and living in a non-resident country. This type of population includes naturalized citizens, lawful permanent residents, refugees and asylees, persons on certain temporary visas, and the unauthorized.	1998 - 2014	OECD database
Life insurance premiums	Is a market penetration indicator, computed as percent of GDP	2004 - 2014	
Health insurance premiums	Is a market penetration indicator, computed as percent of GDP	2004 - 2014	
Households' total deposits, as growth rate	It is a measure of banks' financial resources growth over time.	2004 - 2014	European Central Bank, Statistical Data Warehouse
Loans for consumption granted to households, as growth rate	It is an indicator signaling whether a bank is expanding its loan for consumption portfolio (short term loans)	2004 - 2014	
Loan-to-deposit ratio	It is a measure of banks' liquidity. A value above 1 indicates that bank loans are not fully covered by deposits.	2004 - 2014	
Households' composite cost of borrowing	The composite cost-of-borrowing indicator represents the interest rate for new loans to households meant for house purchase (percentages per annum)	2003 - 2014	
Investment fund shares/units	Is a proxy variable for the investment fund sector	2008 - 2014	
Net equity of households in life insurance reserves and in pension funds reserves	Is a proxy variable for the insurance and pension funds sector	2008 - 2014	
Herfindahl index for credit institutions, total assets, domestic (home or reference area)	It is a metric computed in order to assess banking system's degree of concentration.	1998 - 2014	
No of bank branches, domestic (home or reference area)	It is an indicator reflecting the territorial spread of bank units	1998 - 2014	
Number of bank employees, outstanding amounts at the end of the period (stocks), domestic (home or reference area)	Another indicator directly related to banks' size and territorial coverage.	1998 - 2014	

Variable name	Description	Data availability	Source
Bank nonperforming loans to total gross loans (%)	It is a metric related to loan portfolio quality. The higher the ratio, the more impaired the loan portfolio.	1998 - 2014	World Bank database
Domestic credit provided by financial sector (% of GDP)	The indicator includes all credit to various sectors, provided by financial institutions such as banks, finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies.	2001 - 2014	
Personal remittances	Are composed by personal transfers and compensation of employees. Personal transfers include all current transfers between resident and nonresident individuals. Compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by nonresident entities.	1998 - 2014	

Source: Authors, based on descriptions retrieved by the international databases mentioned in the table

Table A2: Correlation matrix between number of immigrants and each financial sector variable

Country	Bank nonperfor-ming loans	Domestic credit provided by financial sector (% of GDP)	Household total deposits, as growth rate	Loans for consumption granted to households, as growth rate	Loan-to-deposit ratio	Households composite cost of borrowing	Number of bank branches	Number of bank employees
Austria	0.559	0.053	-0.595	-0.447	-0.487	-0.728	-0.533	0.293
Belgium	0.365	0.506	-0.541	-0.385	0.277	-0.433	-0.955	-0.960
Czech Rep.	-0.921	-0.273	-0.039	na	na	na	-0.222	-0.817
Denmark	0.816	0.759	-0.285	na	-0.482	na	-0.818	-0.518
Finland	-0.448	0.898	0.139	-0.760	0.018	-0.390	-0.515	-0.723
France	-0.468	0.656	na	na	-0.178	-0.713	0.644	0.621
Germany	-0.513	0.460	-0.595	-0.135	-0.440	-0.571	-0.465	-0.529
Hungary	0.041	0.592	na	na	0.178	na	0.423	0.613
Italy	-0.134	0.222	0.170	-0.425	0.254	na	0.606	-0.147
Ireland	-0.175	0.112	0.734	0.712	-0.301	-0.209	-0.085	0.314
Luxembourg	-0.423	0.836	0.477	0.068	na	0.753	-0.173	0.805
Netherlands	0.767	0.792	-0.573	-0.650	na	-0.515	-0.654	-0.712
Norway	na*	0.915	na	na	-0.191	-0.597	na	na
Poland	-0.387	0.551	0.166	na	na	na	0.601	0.293
Portugal	0.135	-0.090	0.233	-0.246	0.578	na	0.420	-0.288
Slovakia	-0.386	-0.456	na	na	-0.487	-0.554	0.033	-0.030
Spain	-0.277	-0.373	0.886	0.888	0.277	na	0.479	0.428
Sweden	-0.761	0.896	0.532	na	na	0.896	-0.584	0.928
Switzerland	na	0.787	na	na	na	na	na	na
UK	-0.222	0.673	na	na	na	na	-0.847	-0.270

* non available, due to absence of data for a given country

Source: Authors, using Eviews

Table A2: Correlation matrix between number of immigrants and each financial sector variable (continuation)

Country	Herfindahl index for credit institutions, total assets	Investment fund shares/units	Net equity of households in life insurance reserves and in pension funds reserves	Life insurance premiums to GDP	Health insurance premiums to GDP	Private pensions' assets	Paid remittances
Austria	-0.585	0.822	0.882	-0.915	0.481	0.724	0.972
Belgium	-0.272	0.325	0.853	-0.850	0.636	0.846	0.544
Czech Rep.	0.163	-0.441	na	-0.923	-0.831	0.117	0.801
Denmark	-0.077	na	na	0.948	0.453	0.740	0.745
Finland	0.869	0.764	0.119	0.713	0.358	0.585	0.965
France	0.293	0.809	0.871	-0.524	0.798	0.870	0.879
Germany	0.735	0.986	0.981	-0.127	0.361	0.571	0.624
Hungary	-0.323	na	na	0.283	na	0.581	0.707
Italy	0.386	-0.479	-0.943	-0.207	na	0.133	0.455
Ireland	0.503	-0.320	-0.376	0.669	na	0.345	0.629
Luxembourg	0.544	0.827	0.771	0.614	na	0.906	0.916
Netherlands	0.794	0.823	0.951	-0.909	0.807	0.514	0.571
Norway	na	na	na	-0.635	na	0.900	0.927
Poland	-0.562	-0.394	na	0.413	na	0.899	0.784
Portugal	0.608	0.651	0.467	0.043	0.610	-0.628	0.509
Slovakia	0.000	-0.976	-0.934	-0.160	na	0.169	0.158
Spain	0.068	0.146	-0.783	-0.712	-0.760	-0.062	0.079
Sweden	0.789	na	na	0.677	-0.559	0.922	0.878
Switzerland	na	na	na	-0.814	0.604	0.815	0.870
UK	0.852	na	na	0.052	na	0.758	0.889

* non available, due to absence of data for a given country

Source: authors, using Eviews