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Anastasia Girshina, Thomas Y. Mathä,
Michael Ziegelmeyer

Peer effects in stock market participation: evidence from immigration

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Household Finance and Consumption Network (HFCN)

This paper contains research conducted within the Household Finance and Consumption Network (HFCN). The HFCN consists of survey specialists, statisticians and economists from the ECB, the national central banks of the Eurosystem and a number of national statistical institutes.

The HFCN is chaired by Ioannis Ganoulis (ECB) and Oreste Tristani (ECB). Michael Haliassos (Goethe University Frankfurt), Tullio Jappelli (University of Naples Federico II) and Arthur Kennickell act as external consultants, and Juha Honkkila (ECB) and Jiri Slacalek (ECB) as Secretaries.

The HFCN collects household-level data on households' finances and consumption in the euro area through a harmonised survey. The HFCN aims at studying in depth the micro-level structural information on euro area households' assets and liabilities. The objectives of the network are:

1) understanding economic behaviour of individual households, developments in aggregate variables and the interactions between the two;
2) evaluating the impact of shocks, policies and institutional changes on household portfolios and other variables;
3) understanding the implications of heterogeneity for aggregate variables;
4) estimating choices of different households and their reaction to economic shocks;
5) building and calibrating realistic economic models incorporating heterogeneous agents;
6) gaining insights into issues such as monetary policy transmission and financial stability.

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The paper is released in order to make the results of HFCN research generally available, in preliminary form, to encourage comments and suggestions prior to final publication. The views expressed in the paper are the author's own and do not necessarily reflect those of the ESCB.

Abstract

This paper studies how peers' financial behaviour affects individuals' own investment choices. To identify the peer effect, we exploit the unique composition of the Luxembourg population and use the differences in stock market participation across various immigrant groups to study how they affect stock market participation of natives. We solve the reflection problem by instrumenting immigrants' stock market participation with lagged participation rates in their countries of birth. We separate the peer effect from the contextual and correlated effects by controlling for neighbourhood and individual characteristics. We find that stock market participation of immigrant peers has sizeable effects on that of natives. We also provide evidence that *social learning* is one of the channels through which the peer effect is transmitted. However, *social learning* alone does not account for the entire effect and we conclude that *social utility* might also play an important role in peer effects transmission.

JEL: G5, D14, D83, G11, I22
Keywords: peer effects, stock market participation, social utility, social learning

Non technical summary

Household participation in the stock market takes on new importance in the current context. Indeed, low inflation and interest rates close to zero reduce the return on bank deposits and induce households to seek alternative investments. Such financial decisions require a costly search for information. For this reason, households consult their friends, colleagues or neighbours, who in turn influence the economic behaviour of those seeking advice. This is often referred to as the "peer effect". It results from preferences for conformity to social norms and learning motives.

The existence of peer effects is well established in the empirical economics literature. For example, immigrants learn to conform to the social norms of their new country. However, to our knowledge, there is no study that has examined the opposite direction, namely how the economic behaviour of immigrants affects the behaviour of natives.

We study this question for the specific case of stock market participation identifying a causal relation between immigrants' and natives' decisions to invest in the stock market. In addition, we measure what part of this effect that can be attributed to learning from financially knowledgeable peers among households living in the same municipality.

To identify the effect of immigrants' stock market participation on that of natives, we take advantage of the fact that 42% of Luxembourg residents were born abroad. We exploit the variation in the share of immigrants across Luxembourg's municipalities, taking into account their composition by country of birth. This variation in the exposure of natives to different investment attitudes makes it possible to identify the peer effect of immigrants on natives.

Our results show that the investment behaviour of immigrants has a significant effect on the decisions of their native peers. In particular, we find that a 10-percentage point increase in the participation rate of immigrants in the stock market is associated with a 5-percentage point increase in the participation rate of natives. We also find that the stock market participation of natives increases with the share of their neighbours employed in the financial sector. We interpret these results as an indication of possible search for information among more financially knowledgeable households.

Our empirical analysis uses several data sets. Household participation in the stock market and other socio-demographic and -economic characteristics are from the Luxembourg Household Finance and Consumption Survey (LU-HFCS) conducted in 2014. Information on stock market participation in other euro area countries comes from the first wave of the Eurosystem HFCS collected in 2010. Finally, the information specific to the municipalities comes from the 2011 Luxembourg Population Census.

Our results confirm the existence of the peer effects identified in the economic literature and support the idea that financial education programs can have significant multiplier effects. Peer effects from immigrants to natives may also be relevant for metropolitan areas with a substantial immigrant population, such as Brussels, Hong Kong, Lausanne, London, Mannheim or Singapore.

1 Introduction

There is a vast literature studying the role of peers' choices on one´s own economic behaviour. Economic behaviour is influenced not only by the environment in which one grew up, but also by the culture and social norms by which one is surrounded (e.g. Guiso et al., 2004). Various economic choices, including consumption (Boneva, 2014), stock market participation (Haliassos et al., 2019; Hvide and Östberg, 2015; Brown et al., 2008; Hong et al., 2004), borrowing (Becker, 2006; Georgarakos et al., 2014), saving for retirement (Duflo and Saez, 2002; Haliassos et al., 2019) and housing (Patacchini and Venanzoni, 2014; Ioannides and Zabel, 2003) are affected to a large extent by the choices of peers in a social circle (Ioannides and Topa, 2010), at work (Hvide and Östberg, 2015; Duflo and Saez, 2002) and in a neighbourhood (Del Bello et al., 2015; Kling et al., 2007). Furthermore, empirical findings on differences in financial behaviour between immigrants and natives suggest that immigrant behaviour tends to converge over time to that of natives across several dimensions (Haliassos et al., 2017). However, to the best of our knowledge, there is no study to date that investigates the impact of immigrant economic behaviour on the financial choices of the native population. We contribute to this literature by studying the decision to participate in risky assets and identifying the effect of immigrants´ stock market participation behaviour on the investment behaviour of their native peers.

Focusing on the effect of immigrants' behaviour on that of natives allows us to identify of the peer effect by using the instrumental variable approach. In particular, we solve the *reflection problem* (Manski, 1993) by exploiting the fact that immigrants and natives satisfy the *excluded peers* property (Bramoullé et al., 2009; De Giorgi et al., 2010).[1] Specifically, we focus on natives and peers living in the same municipality and instrument municipality-specific stock market participation rates among immigrants by using the lagged stock market participation rates in their countries of birth. This instrument is valid because one's stock market participation is strongly correlated with the participation rates in one's country of birth and because the behaviour of natives is not directly affected by the behaviour of those living abroad, except through the behaviour of immigrant peers. Moreover, this approach allows us to rule out simultaneity of individual behaviour because stock market participation in the country of birth of immigrants is not influenced by that of native residents in Luxembourg and, therefore, reverse causality can be excluded. To further disentangle the peer effect from contextual and correlated effects (Manski, 1993) we explicitly control for individual investment preferences and for municipality-specific characteristics.

Our second contribution relates to empirical research on the mechanisms underlying peer effects in financial behaviour. The two main transmission channels of peer effects identified in the literature are *social utility* and *social learning*. However, it is an open debate which of the two matters most. On the one hand, Bursztyn et al. (2014) show in an experimental study that peer effects are transmitted through both *social learning* and *social utility* channels. They define *social learning* as all knowledge spillovers, from the awareness of the investment opportunity to opinion transmission, while *social utility* summarises Gali's (1994) notion of *keeping up with the Joneses* and accounts for preferences for conformity and payoff complementarities. On the other hand, Banerjee et al. (2013) show that, once information transmission is properly accounted for, individual behaviour no longer depends on group behaviour. Results by Haliassos et al. (2019)

[1] In our setting, we can only study the effect of immigrants on natives and cannot rule out the *reflection problem* from immigrants to immigrants, natives to natives, or natives to immigrants.

suggest the transfer of knowledge rather than pure imitation. In other words, they find no evidence supporting the *social utility* channel in the transmission of peer effects. We contribute to this debate by accounting for attributes that represent learning, such as individuals' financial literacy, as well as their and their neighbours' employment in the financial sector.

To study the effect of immigrants' stock market participation on the stock market participation of natives, we focus on the case of Luxembourg. The reason why Luxembourg provides a unique setting for our study is twofold. First, a large share of the population resident in Luxembourg is foreign-born. At country level, about one-half of all Luxembourg residents are immigrants and their share various strongly across municipalities. Second, the immigrant population in Luxembourg is very heterogeneous and comprises both groups with very low stock market participation rates and some whose participation rates are twice as high as that of natives. Together, this results in a substantial degree of variation in natives' exposure to different investment attitudes and thus allows us to study the effect of immigrants' financial behaviour on that of natives.

In the empirical analysis, we use several datasets. Our main source is the second wave of the Luxembourg Household Finance and Consumption Survey (LU-HFCS) from the year 2014. This is a representative survey of the resident population in Luxembourg. The survey provides detailed information on individuals' economic and socio-demographic characteristics, on their country of birth, as well as on their current residence in Luxembourg at the detail of the 4-digit postal code. To construct the instrument, we use the data from the first wave of the Eurosystem HFCS, mainly referring to the year 2010, which provides harmonised information about stock market participation for most euro area countries. Finally, we complement individual-level data with municipality-specific information from the Luxembourg Population Census of 2011. In particular, we use information regarding the composition of the municipalities' population to weight the stock market participation rates in the Eurosystem HFCS dataset to construct the instrumental variable, and rental prices at municipality level to account for contextual effects.

Our results suggest that the financial decisions of the native population are influenced by the financial choices of immigrants in their community. In particular, we find that the magnitude of the peer effect of immigrants' stock market participation on that of natives is 0.5, meaning that a 10 percentage point increase in the participation rate of immigrants is associated with a 5 percentage point increase in the participation rate of natives. Controlling for financial learning channels, we find that at least part of this peer effect is due to *social learning*. The effect of the average participation among immigrants decreases by almost one half after controlling for financial literacy, employment in the financial sector and the share of neighbours working in the financial sector, which proxies for financial knowledge. The latter, which seems to be driving the *social learning* effect, has an estimated coefficient of around 0.5, depending on the specification. This means that a 10-percentage point increase in the proportion of peers working in the financial sector would lead to a 5-percentage point increase in the probability that an individual invests in stocks. In our context, immigrants might be contributing to this effect to a rather large extent, since 81% of those working in the finance industry were born outside Luxembourg.[2] Our findings are robust to a placebo test, relaxation of the linearity assumption, use of alternative instrumental variables and a variety of sample specifications.

[2] The finance industry is comprised of credit institutions and professional financial services firms. Insurance companies are excluded. The proportion is reported as of the third quarter 2014 - the latest date available before the reporting changed. Source: Central Bank of Luxembourg tables 14.02 and 11.02 (1991-2014).

To the best of our knowledge, this is the first study to analyse the response of the native population to the financial choices of immigrants. Although the results for Luxembourg might not be representative for other countries, they are likely to hold for certain areas with a large immigrant population.[3] Moreover, our research design provides a unique setting to identify peer effects by exploiting the *excluded peer group* property and employing an instrumental variable approach.

Understanding how financial culture is transmitted through peer effects can serve to design effective and sustainable financial inclusion policies given on-going immigration in Europe. Our findings suggest that peer effects generate social multipliers in financial behaviour. On the one hand, they foster financial literacy and ultimately financial inclusion through *social learning*. On the other hand, peer effects potentially amplify panics through *social utility.* The latter conclusion is based on the result that *social learning* alone does not explain the entire peer effect. Moreover, since financially knowledgeable persons seem to play a major role in transmitting peer effects, better financial inclusion and greater stock market participation could be achieved by increasing the number of financially literate peers in local networks, which in our case are defined by the municipality.

The paper proceeds as follows. Section 2 summarises the main findings on peer effects in investment decisions. Section 3 reviews the setup of the empirical analysis. Sections 4 and 5 discuss in detail the methodology and the data. Section 6 presents main results and describes the robustness tests. Section 7 concludes.

2 Previous research

There is a vast literature analysing differences in financial market outcomes between immigrants and natives (e.g., Haliassos et al., 2019; Chen, 2013), as well as the interdependence (Kelly and Gráda; 2000) and assimilation (e.g., Haliassos et al., 2017) of immigrants' financial behaviour. However, the reverse question, whether immigration affects natives' financial decisions, has received little attention.[4] One exception is Brown et al. (2008), the study most similar to ours, which examines the effect of stock market participation in one's neighbourhood on one's decision to own stocks. To identify the causal link between community and individual stock market participation, they focus on the behaviour of "native" residents in the United States, i.e. those residents whose state of birth and residence coincide, and instrument average ownership in the community by using information on participation rates in the states of birth of "non-native" neighbours. The results show that an individual is more likely to participate in the stock market if more people in their community are stock market investors and that this effect is stronger for communities in which individuals are more likely to seek advice from their neighbours.

Although there is a large body of research that analyses peer effects in financial behaviour in a variety of other settings there are few studies on investment decisions and portfolio allocation that consider peer effects between immigrants and natives,. Duflo and Saez (2002) study retirement savings decisions and are among the first to analyse the causal effect of peers' choices on individuals' financial outcomes. As in most papers studying peer effects on financial choices, they find a positive association between group behaviour

[3] For example Lausanne in Switzerland (41.9%), Mannheim in Germany (38.7%), London in the U.K. (36.7%), and Brussels in Belgium (35%) (Burdett, 2015).

[4] Many studies pose similar questions in the context of education. Two examples are Gould et al. (2009) and Angrist and Lang (2004).

and individual decisions (see Table A1 in the Appendix). However, there is no consensus on what drives these effects.

In particular, Bursztyn et al. (2014) run an experimental study to disentangle two channels of social influence in financial decision-making: *social learning* and *social utility*, and conclude that both matter. Differently, Banerjee et al. (2013) distinguish between a pure *information effect*, which reflects the awareness of opportunity, and an *endorsement effect*, which depends on participation among one's peers. For microfinance borrowing decisions, they find that the information effect matters, but there is no statistical evidence of the *endorsement effect*. Li (2014) further provides evidence consistent with the *social learning* channel. More specifically, he studies the importance of information sharing regarding financial decisions within family networks and finds that the probability of investing in stocks increases if children or parents recently entered the stock market. By showing that the results only hold for entry decisions and that there is no correlation with stock market exits, the author concludes that information sharing is driven by *social learning*. Haliassos et al. (2019) also conclude that the effect of the transfer of knowledge is more important than pure imitation, by documenting that exposure to financially literate neighbours increases households' participation in stock markets. Contrary to these studies, Cooper and Rege (2011) find that, under uncertainty, the main driver of peer effects is *social regret,* which is a channel consistent with Bursztyn et al.'s (2014) *social utility* hypothesis.

The remaining empirical literature on peer effects in financial behaviour estimates the combined effect of *social learning* and *social utility*. For example, several studies investigate the effects of social interactions on portfolio choices by looking at professional trades (Hong et al., 2005; Pool et al., 2015) or private investors (Ivkovic and Weisbenner, 2007; Kaustia and Knüpfer, 2012). These papers find that investors who live in the same city or neighbourhood (Hong et al., 2005; Ivkovic and Weisbenner, 2007; Kaustia and Knüpfer, 2012) are more likely to trade the same stocks (Hong et al., 2005; Ivkovic and Weisbenner, 2007), to have a portfolio overlap (Pool et al., 2015), and to enter the stock market if their peers recently experienced positive returns (Kaustia and Knüpfer, 2012). Several other papers highlight the importance of social interactions in investment decisions by arguing that sociability reduces fixed participation costs through cheaper information sharing (Georgarakos and Pasini, 2011; Hong et al., 2004; Ivkovic and Weisbenner, 2007). While all these studies attribute their results to *word-of-mouth* communication about stocks among investors, their conclusions about the quality of the shared information differ.[5]

To summarize, there is a vast literature on peer effects in economic behaviour. Most of the papers conclude that economic choices are affected by that of peers through social interactions. However, only a handful of papers attempt to disentangle its drivers. Our contribution to the literature is twofold. First, we estimate how immigrants' financial behaviour affects natives' financial decisions. And, second, we quantify *social learning* and *social utility* channels of the estimated peer effect. Our results, in combination with recent findings on the nature of peer effects in financial behaviour and on differences between immigrants and natives, suggest that financial culture and investment attitudes are transmitted through social interactions, which could contribute to effective policies to foster financial inclusion.

[5] Our paper is also closely related to the literature on peer effects in consumption (Agarwal et al., 2016; Boneva, 2014; Cai et al., 2009), indebtedness (Becker, 2006; Georgarakos et al., 2014), housing choice (Patacchini and Venanzoni, 2014; Ioannides and Zabel, 2003) and programme participation (Aizer and Currie, 2004).

3 Background and study set-up: Luxembourg and its immigrants

Luxembourg offers a unique context to study the effects of immigration and of the exposure to different financial cultures on the portfolio choices of natives. There are several reasons for this. First, roughly half the Luxembourg population is foreign-born and this figure reaches more than 60% in certain areas of the country (see Table A2 in the Appendix). Most immigrants originate from neighbouring countries (Belgium, France and Germany) and from Southern Europe (Portugal and Italy). The share of immigrants from these countries varies substantially across municipalities, ranging from 53% to 92% of the foreign-born residents in certain municipalities.

Over the years, Luxembourg attracted both highly qualified and low-skilled immigrants. The heterogeneity of the foreign-born population is also reflected in stock market participation rates (Table 1).[6] Immigrant households from Portugal have one of the lowest stockownership rates in Luxembourg, which is even lower than the stock market participation in Portugal. Germans, Italians and Belgians resident in Luxembourg are almost twice more likely to participate in the stock market than the population in their respective countries of birth. This reflects differences in the selection process into immigration across these countries. While Germans, Italians and Belgians who live in Luxembourg are more likely occupy jobs requiring higher education, immigrants from Portugal are more likely to occupy low-skilled jobs, with lower educational attainment and lower income. Compared to natives, immigrants tend to have either a high or a low level of educational attainment. Put differently, a relatively higher share of natives have a medium level of educational attainment.

More generally, differences between natives and immigrants exist along several dimensions. In particular, immigrants are younger on average than natives and fewer of them are retired or widowed, while there are no differences in divorce and marriage rates (Table A3 in the Appendix). More than 50% of immigrant household heads have an immigrant partner compared to just 12% of natives. Turning to the economic situation (Table A4 in the Appendix), homeownership rates of natives in Luxembourg are significantly higher than those of immigrants but there are no significant differences in life insurance ownership or the probability of holding debt. Income and net wealth are, on average, higher for Luxembourg natives than for immigrants. The difference in income is driven by the fact that a high share of natives tends to be employed in the public sector (47% of natives are employed in public sector jobs relative to 14% of immigrants), which offers higher salaries on average than the private sector. The higher average net wealth is a direct consequence of higher homeownership rates among natives and the sustained increase in house prices over recent decades. This is also reflected by the fact that natives have higher conditional mean levels of both residential real estate wealth and liabilities, although there are no significant differences in financial wealth. Lastly, immigrants are on average more financially literate, more risk loving, and more likely to work in the financial sector (12% of immigrants work in the financial sector compared to 5% of natives).

6 Household socio-demographic characteristics refer to the characteristics of the household head, identified as the financially knowledgeable person for the purpose of the survey.

Table 1: Composition of Luxembourg population and stock ownership rates by country of birth

Groups	Country of birth	Population in Luxembourg, %	Risky asset ownership rates in Luxembourg in 2014, %	Risky asset ownership rates in country of birth in 2010 (instrument), %	
				All residents	Only natives[a]
Natives	Luxembourg	56.96	20.84	24.34	27.60
Main immigrant groups	Portugal	16.08	0.48	6.34	6.13
	France	6.14	22.74	21.23	n.a.
	Italy	3.52	21.49	9.24	9.96
	Belgium	3.30	42.84	25.80	27.25
	Germany	2.35	39.20	21.39	23.30
Immigrants from other European countries available in the Eurosystem HFCS dataset	Netherlands	0.76	12.97	22.48	n.a.
	Spain	0.71	37.11	13.30	n.a.
	Greece	0.30	0.00	3.57	3.68
	Finland	0.21	97.06	38.54	39.20
	Austria	0.15	91.41	12.94	13.73
	Slovakia	0.12	0.00	3.26	3.17
	Slovenia	0.08	0.00	19.69	20.07
	Malta	0.04	na	20.01	19.39
	Cyprus	0.01	na	35.06	37.69

Note: The table reports the composition of the population in Luxembourg by nationality based on Census 2011 and stock ownership rates in Luxembourg in 2014 based on second wave of the LU-HFCS. In addition, it contains risky asset ownership rates in the country of birth based on the first wave of the Eurosystem HFCS. Data is weighted and multiply imputed.

[a] In France, Spain and the Netherlands, data on ownership rates is computed only for the total population because the country of birth/nationality is not collected/available.

Finally, the composition of the immigrant population varies greatly across municipalities, as does their financial behaviour. According to the Luxembourg Census of 2011, the share of immigrants varied from 15% to 65% across municipalities, with the five main immigrant groups accounting for 11-55% of the municipal population (see Table A2in the Appendix). Immigrants from the same country of birth tend to select the same municipalities for their residence in Luxembourg. For example, in some municipalities, the Portuguese made up 45% of the total population and 82% of the total immigrant population. This pattern is similar for the French and Belgians, whose shares in certain municipalities reached 14% (27%) and 18% (64%) of the total (immigrant) population, respectively. In the context of this paper, this distribution of immigrants across municipalities creates substantial variation in the exposure of natives to other cultures, including investment attitudes and stock market participation. As can be seen from Table 2, stock market participation differs substantially at the municipality level, with a larger variation across immigrants. This reflects both differences in population composition of municipalities and in financial behaviour across population groups. For example, while stock market participation among the Portuguese is one of the lowest, participation rates of Germans and Belgians are twice as high as for Luxembourg natives (Table 1).

Table 2: Summary statistics of municipality characteristics

	Mean	Median	Mean standard deviation
Immigrants, % (based on LU-HFCS sample)	34.7	35.9	23.4
Immigrants, % (based on CENSUS)	33.5	32.6	9.8
Stock market participation all population, %	20.2	14.3	21.2
Stock market participation of natives, %	*22.5*	*13.3*	*14.3*
Stock market participation of immigrants, %	*16.4*	*2.3*	*23.1*
Financially literate, %	72.9	75.9	13.8
Risk loving, %	4.3	0.0	12.4
High education attained, %	30.9	28.4	24.9
Unemployed, %	2.0	0.0	6.0
Working in financial sector, %	5.3	0.1	8.7
Age	50.1	51.2	8.6
Homeownership, %	77.1	78.9	22.3
Income, Euro	89 138	86 010	34 068
Main residence value (conditional mean), Euro	510 121	491 186	216 954
Net wealth, Euro	783 840	708 524	543 526
Municipality population (based on CENSUS)	4 669	2148	9 904
Municipality square km	22.3	20.3	13.4
Municipality number observations (based on LU-HFCS sample)	15	8	27

Note: The table reports descriptive statistics for socio-demographic and economic characteristics at municipality level. Two datasets are used: the 2014 wave of LU-HFCS and 2011CENSUS data. Statistics are only reported for municipalities in the LU-HFCS sample. All the statistics are computed at municipality level. Mean and median is not weighted by municipalities' population and, therefore, is not representative of the country. Our data covers municipalities with 499 553 residents in total, representing 98% of the population in 2011. We observe 107 out of 116 municipalities existing in 2011.

To summarize, there are substantial differences in stock market participation rates across municipalities that cannot be explained solely by socio-demographic characteristics. Natives in Luxembourg are exposed to different investment attitudes since the population composition varies substantially across municipalities and immigrant groups differ in their stock market participation. This variation allows us to study how immigrants' portfolio choices affect investment decisions among natives.

4 Methodology and empirical strategy

4.1 Identifying and estimating peer effects: instrumental variable approach

To identify the effect of immigrants' stock market participation on investment decisions of natives residing in the same municipality, we first specify our baseline regression by a linear-in-means model[7], including the variable meant to capture endogenous peer effects and a set of socio-demographic and economic characteristics:

$$y_{i,m,N} = \alpha^* + \beta_F^* \, \hat{E}\,(y|m,F) + Z'_{i,m,N}\eta^* + u_{i,m,N}\,, \tag{1}$$

where $y_{i,m,N}$ is an indicator taking value one if a native (N) household i residing in municipality m has investments in stocks or mutual funds. $Z'_{i,m,N}$ is a row vector of household socio-demographic and economic

[7] We report results of a probit model in the appendix.

characteristics and $\hat{E}(y|m,F)$, specified in equation 2, is the stock market participation rate of immigrant peers of a household i living in municipality m.

$$\hat{E}(y|m,F) = \frac{\sum_{j \in P_{F,m,i}} y_{j,m,F}}{N_{m,F}}, \tag{2}$$

where $P_{F,m,i}$ is a set of immigrant (F) neighbours of a native individual i living in a municipality m, $y_{j,m,F}$ is the individual participation decision of immigrants residing in municipality m, and $N_{m,F}$ is the number of immigrants living in municipality m.

It is well known that, due to the *reflection problem* (Manski, 1993), a simple regression of a native's decision to invest in stocks on stockownership rate among immigrants in their community would not produce a consistent estimate of the peer effect of interest, i.e. how natives change their stock market participation behaviour in response to different investment attitudes among their immigrant peers. More specifically, the OLS estimate of the coefficient β_F^*, meant to capture this effect, would be biased due to reverse causality and omitted confounding *contextual* and *correlated* effects.[8]

To estimate the peer effect consistently and to rule out correlation of investment behaviour between natives and immigrants driven by unobserved correlated characteristics, the ideal experiment in our context would be to allocate immigrants randomly to municipalities. In the absence of such an experiment, we solve the reflection problem by relying on an instrumental variable approach and by controlling for municipality-specific characteristics and individual risk preferences. More specifically, our identification strategy exploits the fact that the network of neighbours in Luxembourg, which consists of natives and immigrants, and the network of immigrants in Luxembourg, which consists of the same neighbourhood network but also relations who remained in their countries of birth, are partially overlapping. As shown in Bramoullé et al. (2009) and De Giorgi et al. (2010), the partial overlap of the network allows identification of the peer effect by instrumenting the peer's group mean behaviour with the mean characteristics of the peer's peers, assuming they do not interact directly with the person in question, the so-called *excluded peers*. Thus, such intransitivity of natives' and immigrants' networks guarantees the existence of instrumental variables for the stock market participation rates of immigrant peers (De Giorgi et al., 2010).

We exploit this feature to construct the instrumental variable for immigrants' stock market participation and rely on the intuition of Guiso et al. (2004) that one's place of birth may have long-lasting effects on one's financial behaviour. In particular, we instrument immigrants' municipality-specific participation rates by lagged stockownership rates in their countries of birth, which is similar to the instrument used by Brown et al. (2008). For the municipality m, we weight the stock market participation rate in the immigrant's country of birth by the municipality-specific share of immigrants from that country:

[8] Durlauf (2004), Topa and Zenou (2014) and Ioannides and Topa (2010) survey the literature on neighbourhood and social network effects and their role in shaping individual behaviour and economic outcomes.

$$\hat{E}^{IV}(y|m,F) = \sum_{CoB \in m} \left\{ \left[\frac{\sum_{j \in P_{F,CoB}} y_{j,F,CoB}}{N_{F,CoB}} \right] * \frac{N_{m,F,CoB}}{N_{m,F}} \right\} \quad (3)$$

where

$\left[\frac{\sum_{j \in P_{F,CoB}} y_{j,F,CoB}}{N_{F,CoB}} \right]$ is the participation rate in the country of birth (*CoB*) and

$\frac{N_{m,F,CoB}}{N_{m,F}}$ is the municipality *m* share of immigrants from a given country of birth (*CoB*).

We use lagged values of the instrument to rule out simultaneous correlated responses to common shocks across countries, thus reducing the potential for spurious correlation.

To be valid, the instrumental variable should satisfy two identifying assumptions. First, it must be relevant, meaning that immigrants' stock market participation should be correlated with stockownership rates in their countries of birth. Second, it must satisfy the exclusion restriction, which means that financial decisions of those remaining in their countries of birth should affect financial choices of the Luxembourg native population only indirectly through their immigrant peers. Under these conditions, stock ownership rates in the countries of birth can be used as an instrumental variable for immigrants' participation rates in Luxembourg.

While the first assumption can be tested, the exclusion restriction poses a potential threat to our identification. More specifically, the exclusion restriction would be violated if there are some common unobservable characteristics that are correlated with the investment decisions of both natives and immigrants living in the same municipality or if individuals living outside Luxembourg affect natives' financial choices directly.

The latter condition is unlikely since, in principle, Luxembourg natives do not interact directly with foreigners who did not immigrate to Luxembourg. The former condition is a larger concern since we use instrumental variables at the municipality level: if immigrants and natives sort themselves into neighbourhoods based on unobservable correlated characteristics, which are also correlated with their stock market participation, they could have similar investment preferences and financial choices, even in the absence of the peer effect (Goldsmith-Pinkham and Imbens, 2013). If these characteristics are also shared with non-resident peers, then the estimated peer effect would be biased upwards.

To address the issue of correlated effects, we control for individual characteristics that might affect both investment preferences and the choice of municipality but are rarely observed in the data and hence remain "unobservable" in most empirical studies. In particular, we control for individual risk preferences, financial literacy and employment in the financial sector. We further control for a set of neighbourhood-specific characteristics by including the municipalities' average rental prices and share of residents working in the financial sector. The former captures groups' economic condition and location within Luxembourg, while the latter accounts for the population composition. If peers had similar unobserved information sets, taste for risk, or face similar economic conditions, possibly because of self-selection into peer groups, then one would observe positive correlation in stock market participation even in the absence of social interaction effects.

Explicitly controlling for these characteristics, partials out the potential bias. This approach carries the further advantage that by controlling explicitly for individual and neighbourhood-specific attributes it provides a better analysis of the investment decision, as well as peer effect transmission.

Formally speaking, to control for the confounding factors, that is the contextual and correlated effects, we include neighbourhood and individual characteristics discussed above and rewrite equation 1 as:

$$y_{i,m,N} = \alpha + \beta_F \, \hat{E} \, (y|m,F) + Z'_{i,m,N}\eta + \, \hat{E} \, (K|m)'\gamma + x'_{i,m,N}\delta + \epsilon_{i,m,N}, \tag{4}$$

such that:

$$\hat{E}(K|m) = \frac{\sum_{j \in P_{m,i}} K_{j,m}}{N_m} \tag{5}$$

where $K_{j,m}$ is a set of neighbourhood-specific characteristics (rental prices and share of residents employed in the financial sector) and $x'_{i,m,N}$ is a vector of risk preferences, financial literacy and an indicator of individual employment in the financial sector. In this specification $E(\epsilon_i|m,Z,K,x)$ is more likely to be zero, so the estimate of the endogenous peer effect β_F is more likely to be unbiased.[9]

4.2 Identifying mechanisms

The correlation between individual decisions and the behaviour of the group, net of contextual and correlated effects, may be driven by two forces: *social utility* and *social learning* (Bursztyn et al., 2014). Both these channels help to explain why peers might play an important role in one's financial decisions. In particular, *social utility*, also labelled the *social interaction effect* (Cooper and Rege, 2011) or simply *keeping up with the Joneses* (Gali, 1994), operates through *social norms*, *social regret*, *preferences for conformity* and *payoff complementarities* (Cooper and Rege, 2011).

Social learning, on the other hand, arises because financial decisions require costly information, so people tend to rely on the knowledge of others. According to Sorensen (2006), *social learning* is a particular form of an endogenous peer effect, whereby individuals might be directly influenced both by the information provided by peers and by the knowledge about their decisions. Dahl et al. (2014) show that the transmission of information is one of the most important drivers of peer effects. This channel also includes social multiplier and "snowball" effects, making *social learning* especially relevant for policy-makers. S*ocial learning* may occur through *rational social learning*, when valuable information is transmitted, through *imitation*, or *through knowledge spillovers* (Cooper and Rege, 2011).

Banerjee et al. (2013) distinguish between the *endorsement channel* of peer effect transmission, which comprises both *social utility* and any transmission of opinions, and the *pure learning channel*, which includes

[9] We control for municipality-specific characteristics, to capture contextual effects and factors common to both natives and immigrants. The choice of these controls is driven by both data availability and the sample size. In principle, following Manski's (1993) discussion, one would include the group-specific averages for all individual-level covariates estimated in the regression. However, our sample size of native residents is too little. Data on rental prices comes from the CENSUS administrative dataset and therefore is only available at the municipality level, without distinguishing rents paid by natives and immigrants. To remain consistent, in the baseline specification, we define the proportion of residents working in financial sector, constructed from our survey, also at the municipality level. We also perform the analysis using group-specific characteristics for the immigrant population. In the robustness analysis, we also include controls for immigrant peers' risk aversion and financial literacy (Table 19).

only awareness about the opportunity and, thus, real knowledge transmission. Little has been done to separate information transmission channels from *social utility*. Despite attempts to identify word-of-mouth communication by using different proxies of sociability, this analysis does not distinguish between *social utility* and *social learning* mechanisms.

We attempt to disentangle the *social utility* and the *social learning* channels by controlling for factors that might be related to the transmission of financial knowledge. To measure the importance of the *social learning* channel, we first control for financial literacy about stocks and financial knowledge other than related to the stock market. Then, we condition on employment in the financial sector, which proxies for knowledge about financial markets and investment opportunities. Finally, we control for the share of the municipality population employed in the financial sector, which not only captures contextual effects, but also addresses possible knowledge spillovers from neighbours employed in the financial services industry.

A word of caution is required regarding the interpretation of our results. First, we cannot disentangle the *social utility* channel per se and speculate that it might be reflected in the part of the overall peer effect not captured by our social learning controls. This way of measuring *social utility* is arguably imperfect since the included covariates may not capture all potential knowledge spillovers.[10] Second, accounting for *social learning* mechanisms only allows us to assess the relative importance of knowledge spillovers captured by our measures and the remaining effect of immigrants' stock market participation. More specifically, the coefficient on the share of neighbours working in the financial sector, which is the variable closest to capturing information transmission, cannot be interpreted as a learning channel in a strict sense. Rather, it is possible that it is a combination of both knowledge spillovers and sorting based on occupation. Third, although it is arguably of interest, we cannot draw inference on how financial knowledge affects one's portfolio choices. While our set of individual controls may capture how financial knowledge is correlated with individual investment decisions, netting out the learning channel, these variables cannot be interpreted causally. This is because financial literacy not only captures own financial knowledge and what was learned from one's peers, but also what was learned from previous investment decisions, which may give rise to reverse causality. Finally, the variables proxying for *social learning* may to some extent also capture individuals' preferences for conformity.

To summarise, our research design allows us, first, to identify the *endogenous peer effect* of immigrants' stock market participation decisions; and second to better understand what drives this effect.

5 Data, sample definition and descriptive evidence

5.1 Individual level data

The individual-level data on Luxembourg residents is from the second wave of Luxembourg Household Finance and Consumption Survey (LU-HFCS) collected in 2014. It provides information on 1,601 households, of which 875 are headed by individuals born in Luxembourg, called *natives*, and 726 are headed by individuals born abroad, referred to as *immigrants*.[11]

[10] We also cannot distinguish between social norms, social regret, preferences for conformity and payoff complementarities within the social utility channel.

[11] For a detailed methodological report on data collection and descriptive evidence, see Girshina, Mathä and Ziegelmeyer (2017).

The LU-HFCS provides a representative data sample of the Luxembourg population suitable for our analysis. First, it contains detailed balance sheet information, a rich set of socio-demographic and socio-economic characteristics, as well as information about respondents' investment attitudes and financial knowledge. Second, it includes the country of birth of the respondent although this information is usually omitted in anonymised household data. Finally, it includes the 4-digit postal code of the main residence, so that we can match households to their respective municipality. This enables us to average immigrants' stock market participation at the municipality level.

Our main dependent variable is a binary variable indicating the household's stock market participation. This takes a value of 1 if a household holds stocks (directly or indirectly through mutual funds) and is zero otherwise. Our main explanatory variable is a municipality-specific average of foreign-born households' stock market participation indicator variables, weighted by the corresponding population weights.

Given that all information regarding a household's wealth and investment holdings is provided by the *financially knowledgeable person* (FKP), we use the FKP's individual characteristics in our analysis. In particular, the regression includes the FKP's age, sex, relationship status (single, married [reference category], widowed or divorced) and whether the FKP's partner (if any) is foreign-born. We also control for the level of educational attainment (low [reference category], medium, high), employment status (employment [reference category], self-employment, unemployment, retirement, other non-working status) and for the FKP's employment in the financial sector. Next, we include an indicator of risk preferences defined as the willingness to "take substantial or above average risk expecting to earn substantial or above average returns". Further, to control for financial literacy, we include a dummy variable indicating who of the respondents correctly answered questions on the difference in the risk profiles of stocks and bonds as well as a variable indicating the share of correct answers to a set of questions concerning financial literacy (mortgage interest rates, inflation and diversification). Finally, we condition on the number of household members and a log transformation of total gross household income.[12]

To construct the municipality-specific instrumental variable on immigrants' stock market participation rates, we make use of the first wave of the Eurosystem Household Finance and Consumption Survey (HFCS) collected around 2010. This dataset has several advantages. First, it contains information on European immigrants, who represent 78% of all immigrants and 34% of the resident population in Luxembourg.[13] Second, this data is harmonised across the EU countries and between the waves, thus allowing us to calculate a stock market participation rates using the same definition across countries. Finally, we use the lagged value of the instrument, which accounts for possible correlated shocks between the endogenous variable and its instrument. To construct the instrumental variable, we first calculate the stock market participation rates in the immigrants' countries of birth.[14] Second, based on CENSUS 2011 data, we use the country shares of immigrants in each Luxembourg municipality to construct a weighted average participation rate for each municipality.[15]

12 For cases where zero income is declared this is recoded to 1 Euro.

13 First wave of HFCS covers 14 European countries in addition to Luxembourg: Belgium, Germany, Greece, Spain, France, Italy, Cyprus, Malta, the Netherlands, Austria, Portugal, Slovenia, Slovakia and Finland.

14 French, Dutch and Spanish data does not include the country of birth. We experimented with an instrument using only data on the native population in the countries of birth. First stage results change partially, but overall results remain the same.

15 We also tried using "population weights" from the LU-HFCS sample to construct our main explanatory variable. Results do not change.

In the main analysis, we restrict the full sample of all households residing in Luxembourg to 875 native households, i.e. whose FKP is born in Luxembourg. We drop households residing in municipalities where no immigrants were sampled in the survey (42 observations) or where immigrants surveyed were not from the European countries included in the first wave of the Eurosystem HFCS (26 observations). Due to the multiply imputed nature of the dataset, we also drop observations for households that are not included in all implicates. This selection leads to a final sample of 805 observations. In the robustness analysis, we restrict the sample to ensure every municipality has at least 2, 3, 5 and 10 observations for both natives and immigrants. Due to the small sample size, however, the number of observations drops dramatically after such restrictions.

5.2 Municipality level data

We choose municipalities for two reasons.[16] First, the municipality is a geographic area small enough for peer effects to matter, with a maximum surface of 113 square kilometres, and an average of 22.3 square kilometres (Table 2). This is small enough, as previous research suggests that peer effects decay as the geographic area increases. Areas larger than 5-10 miles' radius (Pool et al., 2015) or 50 miles' radius (Ivkovic and Weisbenner, 2007), which translates to areas between 78 and 7,854 square miles, tend to show decreasing peer effects.[17] Second, although we have data available at the 4-digit postal code level, this does not include sufficient observations in a neighbourhood and administrative data on the composition of the population is available only at municipality level.

In 2011, Luxembourg counted 116 municipalities, of which our survey covers 107. Administrative data from the 2011 Population Census collected by the National Institute of Statistics and Economics Studies of the Grand Duchy of Luxembourg (STATEC) contains information on residents and their origins in each municipality. We use this information to construct our instrumental variable. We also use CENSUS information to construct municipality-specific controls, namely dummies for each quintile of the distribution of square metre rental prices and the share of residents employed in the financial sector.

6 The effect of immigrants' stock market participation on the stock market participation of natives

6.1 Main empirical results: OLS and two-stage least squares

Our main results are presented in Table 4, which reports estimates of the linear probability model of a natives' stock market participation based on stockownership rates among her immigrant peers. Our baseline specification includes a set of socio-demographic and economic controls, such as income, level of education and other relevant characteristics (column 1 of the Table 4). The results show that there is a strong positive correlation between the stockownership of native and foreign-born households. In particular, the effect of

[16] We also repeated the analysis by grouping municipalities into –"cantons", where more observations are available. Results are robust to this aggregation.

[17] To put the size of Luxembourg into perspective, the total surface of the country is 2,586 km², which is divided into 116 municipalities (as of 2011) or 12 cantons. In comparison, the surface of New York city is 1,214 km², which has 5 boroughs - a typical unit of analysis of neighbourhood peer effects in the US setting.

immigrants' stock market participation on that of natives is 0.18 in the OLS specification. Thus, a 10 percentage point increase in immigrants' stock market participation leads to a 1.8 percentage point increase in the probability of a native investing in stocks.

Turning to the instrumental variable approach, the first stage results for all specifications (Table 3) show that stock market participation in countries of birth is strongly correlated with that of immigrants in Luxembourg. While immigrants in Luxembourg are almost three times more likely to invest in the stock market compared to households remaining in their country of birth, the ranking across countries is preserved: immigrants from countries with higher stock market participation are more likely to invest in stocks than immigrants from countries with lower stock market participation (Table 1).[18] These facts validate the choice of instrumental variable and the F-statistic confirms its explanatory power. In addition, the endogeneity test suggests that instrumental variable estimates are preferable to OLS.[19]

Table 3 First stage results for the full sample

	OLS			
	(1)	(2)	(3)	(4)
Average stock market participation	2.97***	2.95***	2.73***	3.41***
in country of birth	(0.75)	(0.75)	(0.90)	(1.09)
P-value	*0.000*	*0.000*	*0.003*	*0.002*
F-statistic of residuals from the first stage	4.36	4.74	1.86	1.76
P-Value Endogeneity test	*0.040*	*0.032*	*0.177*	*0.188*
Financial knowledge and preference controls		Yes	Yes	Yes
% of municipality population employed in financial sector			Yes	Yes
Other municipality-specific controls				Yes
Number of observations	805	805	805	805

Note: The table reports first stage regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least one immigrant was interviewed and his/her country of birth is included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. The instrumental variable is the average participation in their countries of birth from the first wave (2010) of HFCS. Socio-demographic controls (not displayed) include an indicator for male; indicators for the level of education; log transformation of income; indicator for risk preference; employed in the financial sector; financial literacy related and not related to stockownership; age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are % of municipality population employed in financial sector and dummies for 5 groups of average rental prices in euro/square metre. Standard errors in parenthesis are clustered by 83 municipalities. Heteroscedasticity robust Hausman test is in form of auxiliary regression: significant coefficient on the residuals from the first stage suggests endogeneity of the instrumented variable. *** p<0.01, ** p<0.05, * p<0.1.

[18] One possible concern is that first stage results may be driven by income effects and not by the cultural persistence of financial behaviour. However, the ranking of stock market participation rates among the countries is preserved (Table 1). This indicates that immigrants from high-participation countries tend to participate more than immigrants from low-participation countries. This fact addresses the concern.

[19] In our baseline specification, we have one endogenous variable and one instrument, as well as the heteroscedasticity robust standard errors. Thus, to evaluate the relevance of the instrument and to ensure that the estimates in the second stage are reliable, we are guided by the "rule of thumb" value of the F-statistics of 10 suggested by Stock et al. (2002).

Table 4: OLS and 2SLS results for the full sample

	OLS (1)	2SLS (2)	OLS (3)	2SLS (4)	OLS (5)	2SLS (6)	OLS (7)	2SLS (8)
Immigrants' stock market participation	0.18**	0.53***	0.16*	0.52***	0.09	0.34*	0.10	0.31*
	(0.08)	(0.19)	(0.08)	(0.19)	(0.08)	(0.20)	(0.08)	(0.19)
Male	0.08***	0.08***	0.06**	0.06**	0.07***	0.07***	0.07***	0.07***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Middle education	0.09**	0.09**	0.08**	0.08**	0.08**	0.08**	0.08**	0.08**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
High education	0.17***	0.14***	0.14***	0.11**	0.13***	0.12***	0.13***	0.12***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)
Log income	0.09***	0.09***	0.09***	0.08***	0.09***	0.08***	0.09***	0.08***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Risk loving			0.23**	0.19**	0.22**	0.20**	0.22**	0.20**
			(0.10)	(0.09)	(0.10)	(0.09)	(0.09)	(0.09)
Employed in financial sector			0.11	0.12	0.08	0.09	0.08	0.09
			(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Financial literacy not related to stockownership			-0.05	-0.07	-0.08	-0.09	-0.08	-0.08
			(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership			0.10***	0.09***	0.09***	0.09***	0.09***	0.09***
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
% of municipality population employed in financial sector					0.60***	0.45**	0.56**	0.42*
					(0.18)	(0.23)	(0.21)	(0.25)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific controls							Yes	Yes
F-statistic on instrument in the first stage		15.59		15.47		9.25		9.73
P-value		*0.000*		*0.000*		*0.003*		*0.002*
Number of observations	805	805	805	805	805	805	805	805
Mean stock market participation	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least one immigrant was interviewed and his/her country of birth is included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 83 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

The corresponding 2SLS coefficients are reported in the column 2 of the Table 4 and imply that a 10 percentage point increase in immigrants' stock market participation leads to a 5.3 percentage point increase in the probability that natives invest in stocks. This effect is notably higher than the coefficient estimated by OLS. One possible reason may be measurement error in average immigrants' stock market participation related to the low number of immigrant households in some municipalities. This may create an attenuation bias in the OLS estimates. However, our instrumental variable relies on a much bigger sample and on the CENSUS administrative data. Another possible explanation may lie in the local nature of the effect estimated with the instrumental variable, since it captures the local average treatment effect, and the causal relationship between stock market participation of immigrants and natives may be heterogeneous across the population. The intensity of exposure to the country of birth will vary with the number of years spent in the country of birth and the strength of contacts with family and friends in the country of birth. The effect will also depend on the strength of the social relationship between natives and immigrants. Such heterogeneity across the population might explain the higher point estimate in the 2SLS specification than in the OLS specification, since the instrument captures the effect of groups whose behaviour was affected most by the instrument, i.e. *compliers* (Oreopoulos, 2006).

We estimate alternative specifications also controlling for investment risk preferences, financial sector employment and financial literacy (columns 3-4 of Table 4). The effect of immigrants' stock market participation shrinks to 0.16 using OLS and 0.52 using 2SLS. This suggests that the correlation between immigrant and native investment behaviour can be partly attributed to sorting and correlated preferences - particularly those on risk attitudes. Unsurprisingly, the results indicate that more risk loving individuals are more likely to invest in stocks by 20 percentage point. Turning to financial literacy, only *financial literacy related to stockownership* seems to matter for stock market participation: knowledge about the different risk characteristics of bonds and stocks is associated with a 10-percentage point increase in the probability of investing in the stock market. This result is in line with findings that more financially knowledgeable people are more likely to invest in stocks (Lusardi and Mitchell, 2011a,b; van Rooij et al., 2011). In our analysis, this correlation cannot be interpreted causally, because knowledge about stocks may be driven by learning through investment experience, suggesting possible reverse causality. Moreover, financial literacy may also include knowledge transmitted by word-of-mouth and, which is attributable *to social learning*. Although we cannot give causal interpretation to financial literacy controls in our setting, including them in the regression specification helps to isolate the *endogenous peer effect* by accounting for correlated preferences and to capture the *social learning* channel. After accounting for financial knowledge about risk differences between stocks and bonds, neither employment in the financial sector nor other financial knowledge has explanatory power for natives' decisions to invest in stocks. Overall, including these controls decreases the peer effect estimate, although it remains significant for both OLS and 2SLS.

Next, we control for the municipality-specific share of residents employed in the financial sector (columns 5-6 of Table 4). This control is meant to account for two factors: sorting and *social learning*. Sorting, because it is plausible that financial sector employees self-select themselves into better locations or locations closer to Luxembourg's financial centre. However, this variable will also contain *social learning* since the proximity to financial sector employees could provide opportunities to learn about financial products. Our estimates suggest that even after controlling for employment in the financial sector, a 10 percentage point increase in the share of municipal population employed in the financial sector raises the probability of investing in the stock market by around 5 percentage point. Moreover, by controlling for the share of peers employed in the

financial sector, the effect of stock market participation among immigrant neighbours falls by one-half to 0.1 in the OLS and to 0.3 in the 2SLS regression.[20] This suggests that the total effect of immigrants' stock market participation is at least partially driven by knowledge spillovers from neighbours employed in the financial industry. However, the share of neighbours working in finance cannot be interpreted as *social learning* in a strict sense, as it most likely also captures the supply effect through the availability and awareness of certain financial products or sorting based on occupation.

To address the sorting of financial sector employees to certain geographic areas, as well as sorting based on wealth and income, we control for municipality-specific residential rental prices as a proxy of municipality wealth (columns 7-8 of Table 4). The inclusion of this control variable slightly decreases the effect of the share of municipality population employed in the financial industry, but it does not affect the overall results.

Our findings can be interpreted as follows. First, our instrumental variable approach allows us to conclude that immigrants' stock market participation affects portfolio choices of natives. Second, we show that this peer effect persists even after including a set of controls capturing contextual and correlated effects. Finally, we find that *social learning* channel accounts for a sizeable portion of the estimated peer effect. This could either mean that we fail to control for all possible drivers of *social learning*, or that the remaining effect of the average immigrants' stock market participation represents the *social utility* effect related to preferences for conformity or payoff complementarities, or a combination of the two.

Our findings may also be important for policy makers. First, they provide evidence of herding in financial behaviour. Second, native households attempt to adjust their financial behaviour when exposed to other financial cultures. Further, the composition of the peer group plays an important role in explaining financial behaviour: the impact of the share of municipality population employees in finance suggests both *social learning* and *sorting*.

Our estimates of the *endogenous peer effect* are in line with those in the literature (Table 4). Our findings on the transmission of peer effects are in line with those of Bursztyn et al. (2014) who show that both *social utility* and *social learning* matter. Bursztyn et al. (2014) also find that social learning effects are largest among the financially unsophisticated, observing behaviour among financially sophisticated peers. We find that natives do appear to learn from those who work in the financial sector. Similarly, Haliassos et al. (2019) find that exposure to financially literate neighbours increases households' participation in stock markets and that the transfer of knowledge is more important than pure imitation. These findings are also in line with the results of Banerjee et al. (2013), who show that peer effects are larger if people transmitting the knowledge are more important in a network sense. The sizable combined effect of variables capturing *social learning* confirms that learning is arguably the main driver of peer effects in financial choices. This is in line with the results by Cai and Szeidl (2018) and Banerjee et al. (2013).

[20] The estimate of OLS in the full sample is not significant, whereas it is in the sample where there are at least two observations for both natives and immigrants in each municipality. Although we present the results for the full sample in the main section, the results for the reduced sample might be more credible, because it excludes the possibility that the municipality averages are calculated based on one observation only.

6.2 Robustness checks

6.2.1 Placebo tests

The first robustness test we perform is to assign individuals randomly to different municipalities. If the effect of immigrant's stock market participation and the share of the municipality population employed in the financial sector do indeed capture peer effects and not spurious correlation, then results should disappear when households are randomly assigned to different municipalities.[21]

The results of the placebo tests are shown in the Table A5. In the first column, we report OLS and 2SLS results with municipality-level explanatory variables correctly assigned. Thus, column 1 is comparable to columns 1 and 2 in Table 4.[22] The second column displays results if immigrants' stock market participation is assigned correctly but the share of municipality population employed in the financial sector is randomly assigned. In this case, the latter does not matter anymore, while the effect of stock market participation increases and individual employment in the financial sector becomes significant. This suggests that the effect of local employment in the financial sector is not spurious. In column three, we also randomly assign immigrants' stock market participation and find that both variables become insignificant while the effect of individual employment in the financial sector becomes more significant. Finally, in column four we randomly assign immigrants' stock market participation and correctly assign the share of the municipality population employed in the financial sector. Now, the only effect that matters is the share of the municipality population employed in the financial sector, and its effect is larger than in column one. The main difference between columns 1-4 and columns 5-8 is that, omitting the control for employment in the financial sector increases the effect of the share of the municipality population employed in the financial sector, as expected.

To make these placebo checks more informative, we repeat the randomisation exercise within six Luxembourg regions. This means that we randomly assign households to the municipalities within their region of residence. This addresses the possible concern that unobserved characteristics of the macro-area of the residence may affect stock market participation decisions. The results are shown in Table A20 confirm that the estimated coefficient of immigrants' stock market participation is no longer significant. This suggests that natives are not affected by immigrants with whom they have a more distant interaction. As for the share of municipality population employed in the financial sector, when it is randomly assigned its coefficient remains significant in the OLS specification although it is lower than if correctly assigned, and it is no longer significant in the 2SLS specification. The fact that it remains significant in the OLS specification may suggest some interaction between households living in different municipalities within the same region remains. This interpretation is not farfetched since Luxembourg is a very small country. This interaction may be less intensive as the effect decays. An alternative interpretation is that there might be some sorting of occupations across regions but not across municipalities.

In summary, this placebo exercise confirms that immigrants' behaviour generates a peer effect through the *social utility* channel and that the financial sector employees living in one's municipality reflect both sorting and *social learning*. The estimated peer effects are not driven by spurious correlation.

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[21] The placebo regression checks whether our results are driven by small sample size in certain municipalities.

[22] To make the evidence clearer and to analyse the relationships between the main variables of interest, we limit the covariates included in the specification of this placebo regression to immigrants' stock market participation and the share of peers employed in the financial sector. As in the first four specifications, we also control for one's own employment in the financial sector.

6.2.2 Exploring additional instruments and alternative models

To verify the exogeneity of the main instrument we use additional instruments to test over-identifying restrictions. We consider several other instruments. First, we include the total share of immigrants in the municipality (Table A7). This was not used to construct our main instrument. Although the over-identification test suggests the new instrument is valid, the F test on the joint predictive power of the instruments is relatively low. Thus, using these two instruments is not our preferred specification, and we rely on the conclusions using main instrument only. As for the Hausman test, it indicates the presence of endogeneity of the instrumented variable. Overall, using this additional instrumental variable does not change the results (Table A7). Next, we use as instruments the shares six selected countries of birth in each municipality. The conclusions remain intact (Table A8). Finally, we relax the linearity assumption by a probit model. Again, this does not change our conclusions (Table A6). Thus, our results are robust to a variety of instrumental variables and to different model specifications.

6.2.3 Exploring additional samples

To address the concern that municipality-specific averages are sometimes constructed using only a few observations, we repeat the analysis for different sub-samples. In particular, we consider only municipalities where there are at least 2, 3, 5 or 10 observations for both natives and immigrants (Table A9 to Table A18). Although the total size decreases very rapidly due to such restrictions, overall conclusions are robust to different sub-samples.

6.2.4 Exploring other characteristics of the reference group

We switch the reference group from the total municipality population to immigrants only. We then include the share of immigrants in the municipality who are employed in the financial sector, as well as the share of risk-loving and financially literate FKPs among immigrants.[23] Table A19 shows that none of the three included covariates affect stock market participation of natives, while the coefficient of immigrants' stock market participation increases relative to the baseline estimates. This suggests that financial literacy as well as risk attitudes among immigrants do not capture the transmission of financial knowledge or investment behaviour. This means that individuals are more sensitive to the information spillovers within their own reference group, as is also found by Duflo and Saez (2002). In our case the reference group would be the native Luxembourg population.

7 Discussion and conclusions

We contribute to the literature on peer effects in financial behaviour by studying, for the first time, how financial choices by immigrants affect those of natives. We further contribute to the debate on the transmission of peer effects by disentangling *social learning* and *social utility* channels.

Our study exploits the unique population composition of Luxembourg to explore the relationship between immigrants and natives. First, immigrants in Luxembourg are very heterogeneous in terms of financial behaviour, with almost no Portuguese-born households participating in stock markets, although participation among German- and Belgian-born households is twice as high as that of native households. Second, there is

[23] For the new reference group, we define financial literacy as of the number of the correct answers to all four financial literacy questions.

substantial variation in population composition at the municipality level. These factors combined create variation in the exposure of natives to different financial behaviour, which we exploit to identify peer effects in stock market participation. Finally, we focus on immigrants because it they satisfy the *excluded peer group* property and allow us to adopt instrumental variable approach.

We thus exploit the spatial variation across municipalities in the financial behaviour of immigrants in Luxembourg and employ the instrumental variable strategy to identify the peer effect. By including controls for municipality-specific characteristics to account for correlated preferences and sorting, we are able to partial out *contextual* and *correlated* effects. Finally, we further control for potential drivers of financial knowledge transmission to capture the *social learning* channel. The remaining peer effect could be interpreted as evidence for the *social utility* channel. In particular, our results show that controlling for individual and group financial knowledge does not fully account for the total peer effect, suggesting other channels of information transmission or that *social utility* matters. We also show that proxies for *social learning* account for at least half the peer effect. We cannot, however, interpret our information sharing proxies as purely learning channels, as they partially capture sorting across municipalities based on social and employment status.

Our findings are in line with those of Bursztyn et al. (2014), who show that both *social learning* and *social utility* drive the peer effect. This is in contrast to Banerjee et al. (2013) who conclude that only *awareness of the opportunity* matters. The two conclusions could be reconciled because Banerjee et al. (2013) study borrowing behaviour, which individuals are less willing to copy or share, and which is, therefore, intrinsically different from investment behaviour, the focus of our study.

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Appendix

AI. Additional Tables

Table A1: Previous papers on community effects on individual financial decision-making

Authors	Outcome	Explanatory variable of interest	Method	Controls	Data	Effect
Beshears et al. (2015)	- Participation in savings plan - Contributions in savings plan	Information about participation of the peers	OLS	Socio-demographic controls	Data collected from a randomized trial	Participation: -0.040**; -1.760*** to 1.083* Contributions: -0.221**; -10.663** to 5.558*
Brown et al. (2008)	Equity ownership (stocks and equity mutual funds)	Average participation in a native's municipality, excluding own observation	2SLS IV: average ownership in the birth states of "non-native" neighbours	Household fixed effects (capturing also community fixed effects), state-year fixed effects, time-varying community-level controls (income, age etc.), community-specific time-trends, trends in community median home value and firms' covariates	US panel of tax returns	0.418*** [a]
Bursztyn et al. (2014)	Investment decision to purchase an asset	Investment decision to purchase an asset of a peer investor: the willingness to purchase and actual ownership	Randomized field experiment	Broker fixed effects and socio-demographic controls	Data collected from a randomized trial	"Social learning": 0.285** — 0.328** "Social utility": 0.220** — 0.242**
Duflo and Saez (2002)	Participation in a supplemental pension plan	Average participation in a reference group, excluding own observation	2SLS IV: average salary and tenure structure in the peer group	Individual socio-demographic and income controls	US University administrative data	0.168** — 0.411***
Georgarakos and Pasini (2011)	Participation in stocks	Fraction of trusting individuals in a region and an indicator for engagement in social activities	Probit and test for endogeneity; IV: quality of the political institutions in the past and frequency of contacts with grandchildren	Country fixed-effects and individual socio-demographic characteristics	Survey of Health, Ageing and Retirement in Europe	Trust: 0.0206** — 0.0211** Sociability: 0.0311*** — 0.0358***
Hong et al. (2004)	Stocks and mutual funds ownership	Sociability indicator	OLS	Risk tolerance, education, age, urban indicator, other socio-demographic controls, dummies for wealth quintiles	Health and Retirement Study	0.0215** — 0.0411***

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Hong et al. (2005)	Share of portfolio allocated to a certain stock	Average share across all funds in the city allocated to this stock, excluding own fund	OLS	Model estimated in first differences	CDA Spectrum	0.1310***
Ivkovic and Weisbenner (2007)	Proportion of stocks bought (sold) in a certain industry in a certain quarter	Proportion of stocks bought (sold) in a certain industry in a certain quarter by all neighbouring households within 50 miles	OLS	Industry-quarter dummies	Private dataset on individual investor's monthly positions and trades	0.207***—0.365***
Li (2014)	Entrance in the stock market in a time interval	Entry in the stock market of parents and children in the past	Logit	Socio-demographic and economic controls; time dummies	Panel Study of Income Dynamics	0.298***—0.475***
Pool et al. (2015)	Portfolio overlap in holdings	Neighbours indicator	OLS	Controls for portfolio characteristics; county-specific control for religiosity and zip-level median home prices	Morningstar, Thomson Financial CDA/Spectrum Mutual Fund Database	0.88***—2.24**

*** p<0.01, ** p<0.05, * p<0.1

[a] The coefficient presented in this table is rescaled to ensure comparability with other studies.

Table A2: Luxembourg population: natives, immigrants and main groups of immigrants by country of birth, %

Municipality	Native-born	Foreign-born	Germany	France	Belgium	Portugal	Italy	Other
Bascharage	72	28	1	4	3	10	4	6
Beaufort	57	43	3	3	2	25	1	9
Bech	76	24	3	4	3	5	2	7
Beckerich	73	27	2	2	11	8	1	3
Berdorf	60	40	3	4	2	12	0	19
Bertrange	52	48	3	8	5	8	7	17
Bettembourg	63	37	1	6	2	18	3	7
Bettendorf	58	42	1	1	1	34	1	3
Betzdorf	68	32	4	4	3	8	2	12
Bissen	66	34	1	3	3	18	2	7
Biwer	74	26	4	3	1	7	1	10
Boulaide	77	23	1	2	10	5	1	5
Bourscheid	75	25	3	2	4	5	0	12
Bous	75	25	2	5	1	9	1	7
Clemency	77	23	1	3	7	7	2	4
Clervaux	66	34	2	3	6	14	0	7
Colmar-Berg	61	39	2	2	3	22	2	9
Consdorf	71	29	3	3	2	14	1	5
Consthum	85	15	1	0	2	9	1	3
Contern	67	33	3	5	3	6	2	13
Dalheim	70	30	3	5	2	10	3	7
Diekirch	62	38	2	2	1	25	2	6
Differdange	48	52	1	3	1	33	5	9
Dippach	67	33	2	5	3	12	4	7
Dudelange	63	37	1	4	1	21	4	6
Echternach	55	45	5	3	1	29	1	6
Ell	72	28	1	1	18	3	1	3
Ermsdorf	69	31	3	1	2	19	1	4
Erpeldange	74	26	2	2	2	13	2	5
Esch-Alzette	48	52	1	4	1	32	4	10
Esch-Sure	56	44	2	3	12	11	0	15
Eschweiler	73	27	2	2	7	7	0	8
Ettelbruck	57	43	2	2	2	24	3	10
Feulen	72	28	1	2	2	15	3	5
Fischbach	72	28	3	2	3	12	1	7
Flaxweiler	75	25	3	2	2	8	1	9
Frisange	70	30	2	7	3	9	4	7
Garnich	74	26	2	4	6	5	2	7
Goesdorf	85	15	2	2	4	4	0	4
Grevenmacher	60	40	8	3	1	17	1	9
Grosbous	79	21	1	2	4	8	2	3
Hef ingen	68	32	1	2	3	13	2	11
Heinerscheid	81	19	1	1	4	9	0	4

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Municipality	Native-born	Foreign-born	Germany	France	Belgium	Portugal	Italy	Other
Hesperange	51	49	3	11	4	11	6	15
Hobscheid	67	33	1	5	13	9	1	4
Hoscheid	79	21	2	1	3	8	1	6
Hosingen	79	21	2	1	3	9	1	6
Junglinster	67	33	4	5	3	7	1	12
Kayl	67	33	1	2	1	19	3	7
Kehlen	65	35	2	6	7	6	3	12
Kiischpelt	76	24	2	2	4	6	0	10
Koerich	70	30	3	5	6	8	2	7
Kopstal	55	45	4	10	6	7	2	15
Lac Haute Sure	78	22	1	3	9	4	0	4
Larochette	38	62	1	3	3	45	2	7
Lenningen	69	31	3	3	4	9	2	11
Leudelange	67	33	2	9	4	8	3	7
Lintgen	60	40	2	3	2	24	1	9
Lorentzweiler	63	37	3	5	3	15	2	10
Luxembourg	35	65	4	14	4	14	6	23
Mamer	55	45	3	8	7	8	5	15
Manternach	76	24	5	2	2	6	1	8
Medernach	54	46	2	3	1	34	0	6
Mersch	62	38	2	3	2	21	2	9
Mertert	67	33	8	2	1	13	1	9
Mertzig	73	27	2	2	2	16	2	4
Mompach	73	27	6	5	1	8	0	7
Mondercange	76	24	1	5	1	7	5	4
Mondorf	59	41	3	9	2	18	2	6
Munshausen	76	24	3	1	6	6	1	8
Niederanven	54	46	6	5	4	6	3	20
Nommern	76	24	2	2	3	10	1	6
Preizerdaul	81	19	2	1	3	8	1	4
Putscheid	77	23	2	1	3	13	1	4
Petange	56	44	0	4	3	26	4	7
Reckange	80	20	2	4	2	5	2	5
Redange	75	25	1	3	7	6	1	7
Reisdorf	63	37	3	2	2	21	1	8
Remich	60	40	4	6	2	18	1	9
Roeser	65	35	2	7	2	13	5	7
Rosport	79	21	5	2	1	7	0	6
Rumelange	60	40	1	4	1	20	3	11
Sandweiler	53	47	3	7	3	11	4	19
Sanem	70	30	1	3	1	14	5	6
Schengen	69	31	4	4	2	14	1	5
Schieren	63	37	1	1	1	25	1	7
Schif lange	63	37	1	3	1	18	3	11
Schuttrange	51	49	5	7	4	7	3	22

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Municipality	Native-born	Foreign-born	Germany	France	Belgium	Portugal	Italy	Other
Septfontaines	66	34	3	4	9	7	2	9
Stadtbredimus	68	32	3	3	2	14	1	9
Steinfort	64	36	1	5	10	10	4	6
Steinsel	62	38	3	6	3	9	4	13
Strassen	45	55	4	11	5	9	6	20
Tandel	77	23	2	1	1	15	1	4
Troisvierges	59	41	1	2	9	23	0	7
Tuntange	69	31	3	5	4	4	1	14
Useldange	77	23	0	2	3	9	1	8
Vianden	58	42	2	2	1	29	1	6
Waldbillig	75	25	2	3	2	8	0	8
Waldbredimus	73	27	3	2	2	6	1	12
Walferdange	52	48	3	7	4	12	4	17
Weiler-la-Tour	72	28	2	7	3	5	3	9
Weiswampach	65	35	2	1	11	14	1	6
Wiltz	54	46	1	3	6	20	1	15
Wincrange	79	21	1	2	7	6	1	4
Winseler	69	31	1	2	18	5	1	4
Wormeldange	62	38	4	3	2	20	1	9

Source: Authors' own computations based on Census 2011. Municipalities are only those present in the LU-HFCS sample.

Table A3: Summary statistics of socio-demographic characteristics of natives and immigrants

	Native-born	Foreign-born	Difference natives vs. immigrants	P-value difference
Demographic characteristics				
Male, %	55.33	58.12	-2.80	0.363
	(2.02)	(2.32)	(3.08)	
Age	52.74	47.30	5.44***	0.000
	(0.73)	(0.70)	(1.02)	
Household characteristics				
Never married, %	28.42	25.58	2.84	0.321
	(1.92)	(2.13)	(2.86)	
Widowed, %	12.23	5.88	6.35***	0.001
	(1.48)	(1.18)	(1.90)	
Divorced, %	12.49	15.21	-2.71	0.208
	(1.32)	(1.70)	(2.16)	
Foreign-born partner, %	12.24	52.49	-40.25***	0.000
	(1.24)	(2.35)	(2.66)	
Household size	2.22	2.65	-0.43***	0.000
	(0.05)	(0.07)	(0.09)	
Educational attainment, %				
High education (ISCED=5,6)	27.99	39.66	-11.67***	0.000
	(1.75)	(2.30)	(2.89)	
Middle education (ISCED=3,4)	45.14	26.69	18.45***	0.000
	(2.03)	(2.10)	(2.93)	
Occupation, %				
Self-employed	5.22	3.52	1.70*	0.074
	(0.71)	(0.64)	(0.95)	
Unemployed	2.32	4.66	-2.34**	0.044
	(0.63)	(0.98)	(1.16)	
Retired	32.84	17.70	15.14***	0.000
	(1.92)	(1.84)	(2.66)	
Employed in financial sector	5.10	11.59	-6.49***	0.000
	(0.86)	(1.52)	(1.76)	
Employed in public sector	46.62	14.26	32.36***	0.000
	(2.82)	(2.03)	(3.49)	
Financial literacy and investment attitude, %				
Financial literacy	73.69	76.51	-2.82*	0.060
	(1.01)	(1.16)	(1.50)	
Risk loving	2.71	8.39	-5.68***	0.000
	(0.62)	(1.40)	(1.54)	
Country of birth out of total sample, %	54.7	45.3		
Number of observations	875	726		

Note: The table reports descriptive statistics for socio-demographic characteristics of immigrants and natives residing in Luxembourg from the second wave of LU-HFCS data (2014) for 1601 households. Data is weighted and multiply imputed. All individual socio-demographic characteristics apply to the financially knowledgeable person (FKP) of the household. Financial literacy is defined as an average number of correctly answered questions out of four financial literacy questions. Risk loving is one if the FKP prefers to take high or above average risk to get high or above average returns (in contrast to average or low risk). Robust standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table A4: Summary statistics of households' economic characteristics

	Native-born	Foreign-born	Difference natives vs. immigrants	P-value difference
Ownership rates, %				
Homeownership	79.50	51.79	27.71***	0.000
	(1.74)	(2.34)	(2.92)	
Stock market participation	20.84	17.00	3.84*	0.092
	(1.54)	(1.67)	(2.27)	
Life insurance	33.09	30.48	2.61	0.359
	(1.86)	(2.13)	(2.84)	
Collateralized debt	33.93	36.87	-2.95	0.307
	(1.87)	(2.20)	(2.89)	
Non-collateralized debt	34.59	32.91	1.68	0.563
	(1.91)	(2.17)	(2.90)	
Income and wealth, Euro				
Income	92,067	80,727	11,340***	0.010
	(2,644)	(3,554)	(4,393)	
Net wealth	919,752	567,196	352,556***	0.001
	(80,949)	(64,084)	(102,939)	
Financial wealth (conditional mean)	140,145	133,664	6,481	0.869
	(12,093)	(37,356)	(39,227)	
Main residence value (conditional mean)	674,498	593,543	80,955***	0.002
	(16,025)	(20,634)	(26,329)	
Total liabilities (conditional mean)	195,116	157,231	37,886**	0.025
	(12,828)	(10,962)	(16,881)	
Number of observations	875	726		

Note: The table reports descriptive statistics for economic characteristics of immigrants and natives residing in Luxembourg from the second wave of LU-HFCS data (2014) for 1601 households. Data is weighted and multiply imputed. The binary variable stock market participation takes value 1 if individual owns stocks directly or indirectly through mutual funds. Life insurance and (non-)collateralized debt ownership rates are constructed accordingly. Robust standard errors are in parenthesis. ***p<0.01, ** p<0.05, * p<0.1

Table A5: Placebo treatment for the full sample

Immigrants' stock market participation assigned: ***% of municipal population employed in financial sector assigned:***	Correctly Correctly	Correctly Randomly	Randomly Randomly	Randomly Correctly	Correctly Correctly	Correctly Randomly	Randomly Randomly	Randomly Correctly
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Controlling for individual employment in financial sector				*Not controlling for individual employment in financial sector*			
	OLS							
Immigrants' stock market participation	0.20***	0.27***	0.09	-0.04	0.20***	0.28***	0.11	-0.05
	(0.07)	(0.08)	(0.23)	(0.08)	(0.07)	(0.09)	(0.23)	(0.08)
% of municipal population employed in financial sector	0.62***	0.01	-0.05	0.75***	0.69***	0.02	-0.06	0.81***
	(0.19)	(0.21)	(0.08)	(0.17)	(0.18)	(0.21)	(0.08)	(0.17)
Employed in financial sector	0.13	0.17**	0.18**	0.13				
	(0.09)	(0.08)	(0.09)	(0.09)				
	2SLS							
Immigrants' stock market participation	0.40**	0.59***	0.12	-0.10	0.38**	0.60***	0.14	-0.10
	(0.19)	(0.19)	(0.32)	(0.22)	(0.19)	(0.20)	(0.31)	(0.21)
% of municipal population employed in financial sector	0.49**	-0.04	-0.10	0.75***	0.57**	-0.03	-0.11	0.81***
	(0.24)	(0.19)	(0.29)	(0.17)	(0.23)	(0.19)	(0.28)	(0.17)
Employed in financial sector	0.14	0.16**	0.17**	0.13				
	(0.08)	(0.08)	(0.09)	(0.09)				
	First Stage							
Average stock market participation in country of birth	2.71***	2.97***	2.71***	2.97***	2.71***	2.97***	2.41***	2.82***
	(0.91)	(0.76)	(0.91)	(0.76)	(0.91)	(0.76)	(0.39)	(0.28)
F-statistic on instrument in the first stage	8.929	15.49	39.49	98.56	8,908	15.61	39.32	98.16
P-value	*0.004*	*0.000*	*0.000*	*0.000*	*0.004*	*0.000*	*0.000*	*0.000*
Number of observations	805	805	805	805	805	805	805	805
Mean stock market participation	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least one immigrant was interviewed and his/her country of birth is included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 83 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

Table A6: Probit results for the full sample

	Probit (1)	ProbitIV (2)	Probit (3)	ProbitIV (4)	Probit (5)	ProbitIV (6)	Probit (7)	ProbitIV (8)
Immigrants' stock market participation	0.13*	0.39**	0.12*	0.38**	0.08	0.23	0.08	0.22
	(0.07)	(0.15)	(0.07)	(0.15)	(0.07)	(0.19)	(0.07)	(0.17)
Male	0.08***	0.08***	0.07**	0.06**	0.08***	0.08***	0.08***	0.08***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Middle education	0.10**	0.10**	0.09**	0.08**	0.09**	0.09**	0.09**	0.08**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
High education	0.14***	0.12***	0.12**	0.10**	0.11**	0.10**	0.11**	0.10**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Log income	0.15***	0.14***	0.13***	0.12***	0.13***	0.12***	0.13***	0.12***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
Risk loving			0.13**	0.10	0.13**	0.12*	0.12**	0.11
			(0.06)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)
Employed in financial sector			0.09	0.09*	0.06	0.07	0.06	0.07
			(0.06)	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)
Financial literacy not related to stockownership			-0.05	-0.07	-0.08	-0.08	-0.07	-0.07
			(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership			0.08***	0.08**	0.08***	0.07**	0.08***	0.07**
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
% of municipal population employed in financial sector					0.50***	0.41*	0.46***	0.37*
					(0.15)	(0.21)	(0.17)	(0.21)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific controls							Yes	Yes
F-statistic on instrument in the first stage		15.59		15.47		9.25		9.73
P-value		*0.000*		*0.000*		*0.003*		*0.002*
Number of observations	805	805	805	805	805	805	805	805
Mean stock market participation	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least one immigrant was interviewed and his/her country of birth is included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 83 municipalities. Probit estimates are weighted average marginal affects. *** p<0.01, ** p<0.05, * p<0.1.

Table A7: 2SLS results with additional instruments for the full sample: average participation in countries of birth and total % of immigrants

	2SLS (1)	2SLS (2)	2SLS (3)	2SLS (4)
Immigrants' stock market participation	0.53***	0.52***	0.35*	0.32*
	(0.19)	(0.19)	(0.20)	(0.18)
Male	0.08***	0.06**	0.07***	0.07**
	(0.03)	(0.03)	(0.03)	(0.03)
Middle education	0.09**	0.08**	0.08**	0.08**
	(0.04)	(0.04)	(0.04)	(0.04)
High education	0.14***	0.12**	0.12***	0.12**
	(0.05)	(0.05)	(0.04)	(0.05)
Log income	0.09***	0.08***	0.08***	0.08***
	(0.03)	(0.03)	(0.03)	(0.03)
Risk loving		0.19**	0.20**	0.20*
		(0.09)	(0.09)	(0.10)
Employed in financial sector		0.12	0.09	0.09
		(0.09)	(0.09)	(0.08)
Financial literacy not related to stockownership		-0.07	-0.09	-0.08
		(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership		0.09***	0.09***	0.09***
		(0.03)	(0.03)	(0.03)
% of municipal population employed in financial sector			0.45**	0.42*
Socio-demographic controls	Yes	Yes	Yes	Yes
Municipality-specific controls				Yes
Mean stock market participation	0.213	0.213	0.213	0.213
First Stage				
Average stock market participation in	2.97***	2.95***	2.65***	3.38***
country of birth	(0.75)	(0.74)	(0.90)	(1.14)
% immigrants	0.01	-0.01	-0.07	-0.04
	(0.15)	(0.15)	(0.16)	(0.27)
F-statistic on instrument in the first stage	8.024	8.004	4.713	4.938
P-value	*0.001*	*0.001*	*0.012*	*0.009*
F-statistic on residuals from the first stage	4.41	4.69	1.91	1.83
P-Value endogeneity test	*0.039*	*0.033*	*0.170*	*0.180*
P-value overidentification test (Sargan)	*0.183*	*0.405*	*0.711*	*0.204*
Number of observations	805	805	805	805

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least one immigrant was interviewed and his/her country of birth is included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS and the share of immigrant's in each municipality. Standard errors in parenthesis are clustered by 83 municipalities. Heteroscedasticity robust Hausman test is in form of auxiliary regression: significant coefficient on the residuals from the first stage suggests endogeneity of the instrumented variable. *** p<0.01, ** p<0.05, * p<0.1.

Table A8: 2SLS results with additional instruments for the full sample: average participation in countries of birth and % of immigrants by country

	2SLS (1)	2SLS (2)	2SLS (3)	2SLS (4)
Immigrants' stock market participation	0.42***	0.40**	0.18	0.16
	(0.16)	(0.16)	(0.17)	(0.14)
Male	0.08***	0.06**	0.07***	0.07**
	(0.03)	(0.03)	(0.03)	(0.03)
Middle Education	0.09**	0.08**	0.08**	0.08**
	(0.04)	(0.04)	(0.04)	(0.04)
High Education	0.15***	0.12**	0.13***	0.12***
	(0.05)	(0.05)	(0.04)	(0.05)
Log Income	0.09***	0.08***	0.09***	0.09***
	(0.03)	(0.03)	(0.03)	(0.02)
Risk loving		0.20**	0.22**	0.21**
		(0.09)	(0.09)	(0.10)
Employed in financial sector		0.12	0.08	0.08
		(0.09)	(0.09)	(0.08)
Financial literacy not related to stockownership		-0.06	-0.08	-0.08
		(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership		0.09***	0.09***	0.09***
		(0.03)	(0.03)	(0.03)
% of municipal population employed in financial sector			0.55***	0.52**
			(0.21)	(0.23)
Socio-demographic controls	Yes	Yes	Yes	Yes
Municipality-specific controls				Yes
Mean stock market participation	0.213	0.213	0.213	0.213
First Stage				
Average stock market participation in country of birth	6.20**	6.20**	6.29**	6.22*
	(2.94)	(2.94)	(3.09)	(3.39)
% German immigrants	-0.07	-0.09	-0.07	-0.43
	(1.91)	(1.90)	(1.87)	(1.87)
% Italian immigrants	2.33	2.27	2.36	1.18
	(1.59)	(1.58)	(1.56)	(2.69)
% Portuguese immigrants	0.21	0.21	0.21	0.32
	(0.42)	(0.41)	(0.42)	(0.50)
% French immigrants	-0.64	-0.65	-0.62	2.20
	(1.43)	(1.43)	(1.45)	(1.82)
% Belgian immigrants	-3.61*	-3.60*	-3.65*	-3.72*
	(1.91)	(1.92)	(2.00)	(2.05)
% Other immigrants	-0.16	-0.16	-0.15	0.20
	(0.80)	(0.80)	(0.80)	(0.74)
F-statistic on instrument in the first stage	6.505	6.539	3.881	5.761
P-value	*0.000*	*0.000*	*0.000*	*0.000*
F-statistic on residuals from the first stage	3.00	2.96	0.31	0.25
P-Value endogeneity test	*0.090*	*0.090*	*0.577*	*0.617*
P-value overidentification test (Sargan)	*0.000*	*0.000*	*0.002*	*0.008*
Number of observations	805	805	805	805

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least one immigrant was interviewed and his/her country of birth is included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS and the share of the six biggest immigrant groups by municipality. Standard errors in parenthesis are clustered by 83 municipalities. Heteroscedasticity robust Hausman test is in form of auxiliary regression: significant coefficient on the residuals from the first stage suggests endogeneity of the instrumented variable. *** p<0.01, ** p<0.05, * p<0.1.

Table A9: First stage for the reduced sample (at least two observations)

	OLS			
	(1)	(2)	(3)	(4)
Average stock market participation in	2.94***	2.92***	2.77***	3.55***
country of birth	(0.80)	(0.80)	(1.01)	(1.27)
F-statistic on instrument in the first stage	13.45	13.36	7.57	7.82
P-value	*0.000*	*0.001*	*0.008*	*0.007*
F-statistic on residuals from the first stage	4.06	4.56	1.30	1.65
P-Value endogeneity test	*0.048*	*0.037*	*0.258*	*0.204*
Socio-demographic controls	Yes	Yes	Yes	Yes
Financial knowledge and preferences controls		Yes	Yes	Yes
% of municipal population employed in financial sector			Yes	Yes
Other municipality-specific controls				Yes
Number of observations	764	764	764	764

Note: The table reports first stage regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least two natives and two immigrants were interviewed and at least one immigrant is from a country of birth included in the first wave of the Eurosystem HFCS dataset. . Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. The instrumental variable is the average participation in their countries of birth from the first wave (2010) of HFCS. Socio-demographic controls (not displayed) include an indicator for male; indicators for the level of education; log transformation of income; indicator for risk preference; employed in the financial sector; financial literacy related and not related to stockownership; age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are % of municipality population employed in financial sector and dummies for 5 groups of average rental prices in euro/square meter. Standard errors in parenthesis are clustered by 65 municipalities. Heteroscedasticity robust Hausman test is in form of auxiliary regression: significant coefficient on the residuals from the first stage suggests endogeneity of the instrumented variable. *** p<0.01, ** p<0.05, * p<0.1.

Table A10: OLS and 2SLS results for the reduced sample (at least two observations)

	OLS (1)	2SLS (2)	OLS (3)	2SLS (4)	OLS (5)	2SLS (6)	OLS (7)	2SLS (8)
Immigrants' stock market participation	0.24**	0.58***	0.21**	0.58***	0.15*	0.36*	0.15*	0.36*
	(0.09)	(0.20)	(0.09)	(0.21)	(0.08)	(0.21)	(0.09)	(0.19)
Male	0.08***	0.08***	0.06**	0.07**	0.07***	0.07***	0.07***	0.07**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Middle education	0.09**	0.09**	0.08**	0.08**	0.09**	0.08**	0.08**	0.08**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.04)
High education	0.19***	0.17***	0.15***	0.14***	0.15***	0.14***	0.15***	0.14***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Log income	0.09***	0.09***	0.09***	0.08***	0.09***	0.08***	0.08***	0.08***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Risk loving			0.23**	0.19**	0.22**	0.20**	0.22**	0.20*
			(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.10)
Employed in financial sector			0.09	0.09	0.05	0.06	0.05	0.06
			(0.09)	(0.08)	(0.09)	(0.09)	(0.09)	(0.08)
Financial literacy not related to stockownership			-0.02	-0.03	-0.05	-0.05	-0.05	-0.04
			(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership			0.10***	0.10***	0.10***	0.10***	0.10***	0.10***
			(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
% of municipality population employed in financial sector					0.66***	0.53**	0.62***	0.48*
					(0.18)	(0.23)	(0.22)	(0.26)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific controls							Yes	Yes
F-statistic on instrument in the first stage		13.45		13.36		7.570		7.816
P-value		*0.000*		*0.001*		*0.008*		*0.007*
Number of observations	764	764	764	764	764	764	764	764
Mean stock market participation	0.211	0.211	0.211	0.211	0.211	0.211	0.211	0.211

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least two natives and two immigrants were interviewed and at least one immigrant is from a country of birth included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 65 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

Table A11: Placebo treatment for the reduced sample (at least two observations)

Immigrants' stock market participation assigned: / ***% of municipal population employed in financial sector assigned:***	Correctly / Correctly	Correctly / Randomly	Randomly / Randomly	Randomly / Correctly	Correctly / Correctly	Correctly / Randomly	Randomly / Randomly	Randomly / Correctly
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Controlling for individual employment in financial sector				*Not controlling for individual employment in financial sector*			
	OLS							
Immigrants' stock market participation	0.26***	0.34***	-0.04	-0.02	0.26***	0.34***	-0.04	-0.03
	(0.08)	(0.10)	(0.08)	(0.08)	(0.08)	(0.10)	(0.08)	(0.08)
% of municipal population employed in financial sector	0.69***	0.01	0.09	0.85***	0.75***	0.02	0.10	0.90***
	(0.19)	(0.21)	(0.23)	(0.17)	(0.18)	(0.21)	(0.23)	(0.16)
Employed in financial sector	0.12	0.16*	0.16*	0.11				
	(0.09)	(0.08)	(0.09)	(0.09)				
	2SLS							
Immigrants' stock market participation	0.42**	0.66***	-0.07	-0.08	0.40**	0.68***	-0.08	-0.08
	(0.19)	(0.21)	(0.29)	(0.22)	(0.18)	(0.21)	(0.28)	(0.21)
% of municipal population employed in financial sector	0.59**	-0.05	0.11	0.84***	0.66***	-0.04	0.13	0.90***
	(0.23)	(0.19)	(0.32)	(0.17)	(0.22)	(0.19)	(0.31)	(0.16)
Employed in financial sector	0.12	0.15*	0.16*	0.11				
	(0.08)	(0.08)	(0.09)	(0.09)				
	First Stage							
Average stock market participation in country of birth	2.75***	2.94***	2.53***	2.93***	2.75***	2.94***	2.53***	2.93***
	(1.02)	(0.80)	(0.41)	(0.30)	(1.02)	(0.80)	(0.41)	(0.30)
F-statistic on instrument in the first stage	7.262	13.35	38.64	97.92	7.245	13.45	38.47	97.59
P-value	*0.009*	*0.001*	*0.000*	*0.000*	*0.009*	*0.000*	*0.000*	*0.000*
Number of observations	764	764	764	764	764	764	764	764
Mean stock market participation	0.211	0.211	0.211	0.211	0.211	0.211	0.211	0.211

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least two natives and two immigrants were interviewed and at least one immigrant is from a country of birth included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 65 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

Table A12: Probit results for the reduced sample (at least two observations)

	Probit (1)	ProbitIV (2)	Probit (3)	ProbitIV (4)	Probit (5)	ProbitIV (6)	Probit (7)	ProbitIV (8)
Immigrants' stock market participation	0.19**	0.43***	0.17**	0.42***	0.12*	0.21	0.12	0.23
	(0.08)	(0.15)	(0.08)	(0.15)	(0.07)	(0.21)	(0.08)	(0.17)
Male	0.09***	0.08***	0.07***	0.07**	0.08***	0.08***	0.09***	0.08***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)
Middle education	0.11***	0.10**	0.10**	0.09**	0.10**	0.10**	0.10**	0.09**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
High education	0.17***	0.15***	0.14***	0.12***	0.13***	0.13***	0.13***	0.13***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Log income	0.15***	0.14***	0.13***	0.12***	0.12***	0.12***	0.13***	0.12***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
Risk loving			0.13**	0.10	0.13**	0.12*	0.12**	0.11*
			(0.06)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)
Employed in financial sector			0.06	0.06	0.04	0.04	0.04	0.04
			(0.06)	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)
Financial literacy not related to stockownership			-0.02	-0.03	-0.06	-0.06	-0.05	-0.05
			(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership			0.08***	0.08***	0.08***	0.08***	0.08***	0.08***
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
% of municipal population employed in financial sector					0.57***	0.52**	0.54***	0.46**
					(0.16)	(0.22)	(0.18)	(0.23)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific controls							Yes	Yes
F-statistic on instrument in the first stage		13.45		13.36		7.570		7.816
P-value		*0.000*		*0.001*		*0.008*		*0.007*
Number of observations	764	764	764	764	764	764	764	764
Mean stock market participation	0.211	0.211	0.211	0.211	0.211	0.211	0.211	0.211

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least two natives and two immigrants were interviewed and at least one immigrant is from a country of birth included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 65 municipalities. Probit estimates are weighted average marginal affects. *** p<0.01, ** p<0.05, * p<0.1.

Table A13: 2SLS results with additional instruments for the reduced sample (at least two observations): average participation in countries of birth and total % of immigrants

	2SLS (1)	2SLS (2)	2SLS (3)	2SLS (4)
Immigrants' stock market participation	0.54***	0.54***	0.34*	0.36**
	(0.19)	(0.19)	(0.19)	(0.18)
Male	0.08***	0.06**	0.07***	0.07**
	(0.03)	(0.03)	(0.03)	(0.03)
Middle education	0.09**	0.08**	0.08***	0.08**
	(0.04)	(0.04)	(0.03)	(0.04)
High education	0.17***	0.14***	0.14***	0.14***
	(0.05)	(0.05)	(0.04)	(0.05)
Log income	0.09***	0.08***	0.08***	0.08***
	(0.03)	(0.03)	(0.03)	(0.03)
Risk loving		0.19**	0.21**	0.20*
		(0.09)	(0.09)	(0.10)
Employed in financial sector		0.09	0.06	0.06
		(0.08)	(0.09)	(0.08)
Financial literacy not related to stockownership		-0.03	-0.05	-0.04
		(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership		0.10***	0.10***	0.10***
		(0.03)	(0.03)	(0.03)
% of municipal population employed in financial sector			0.54**	0.48*
			(0.22)	(0.26)
Socio-demographic controls	Yes	Yes	Yes	Yes
Municipality-specific controls				Yes
Mean stock market participation	0.211	0.211	0.211	0.211
First Stage				
Average stock market participation in country of birth	2.92***	2.90***	2.59**	3.40**
	(0.78)	(0.78)	(0.99)	(1.32)
% immigrants	-0.08	-0.10	-0.16	-0.14
	(0.16)	(0.16)	(0.16)	(0.30)
F-statistic on instrument in the first stage	7.175	7.137	4.053	4.240
P-value	*0.002*	*0.002*	*0.022*	*0.019*
F-statistic on residuals from the first stage	3.39	3.84	1.17	1.79
P-Value endogeneity test	*0.070*	*0.054*	*0.282*	*0.1856*
P-value overidentification test (Sargan)	*0.056*	*0.141*	*0.787*	*0.681*
Number of observations	764	764	764	764

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least two natives and two immigrants were interviewed and at least one immigrant is from a country of birth included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS and the share of immigrant's in each municipality. Standard errors in parenthesis are clustered by 65 municipalities. Heteroscedasticity robust Hausman test is in form of auxiliary regression: significant coefficient on the residuals from the first stage suggests endogeneity of the instrumented variable. *** p<0.01, ** p<0.05, * p<0.1.

Table A14: 2SLS results with additional instruments for the reduced sample (at least two observations): average participation in countries of birth and % of immigrants by country

	2SLS (1)	2SLS (2)	2SLS (3)	2SLS (4)
Immigrants' stock market participation	0.35**	0.33**	0.11	0.12
	(0.14)	(0.14)	(0.15)	(0.13)
Male	0.08***	0.06**	0.07***	0.07**
	(0.03)	(0.03)	(0.03)	(0.03)
Middle Education	0.09***	0.08**	0.09***	0.08**
	(0.04)	(0.04)	(0.03)	(0.04)
High Education	0.18***	0.15***	0.15***	0.15***
	(0.05)	(0.05)	(0.04)	(0.05)
Log Income	0.09***	0.08***	0.09***	0.09***
	(0.03)	(0.03)	(0.03)	(0.02)
Risk loving		0.22**	0.23**	0.22**
		(0.09)	(0.09)	(0.10)
Employed in financial sector		0.09	0.05	0.05
		(0.09)	(0.09)	(0.08)
Financial literacy not related to stockownership		-0.02	-0.05	-0.05
		(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership		0.10***	0.10***	0.10***
		(0.03)	(0.03)	(0.03)
% of municipal population employed in financial sector			0.68***	0.64***
			(0.19)	(0.24)
Socio-demographic controls	Yes	Yes	Yes	Yes
Municipality-specific controls				Yes
Mean stock market participation	0.211	0.211	0.211	0.211
First Stage				
Average stock market participation in country of birth	6.63**	6.70**	6.95**	7.63*
	(3.14)	(3.14)	(3.29)	(3.93)
% German immigrants	-1.18	-1.19	-1.16	-1.58
	(2.09)	(2.08)	(2.07)	(2.01)
% Italian immigrants	1.23	1.19	1.40	0.54
	(1.71)	(1.70)	(1.67)	(2.64)
% Portuguese immigrants	0.07	0.09	0.08	0.36
	(0.45)	(0.44)	(0.45)	(0.59)
% French immigrants	-0.81	-0.83	-0.82	2.17
	(1.48)	(1.48)	(1.52)	(1.87)
% Belgian immigrants	-4.86**	-4.91**	-5.06**	-5.46**
	(1.93)	(1.93)	(2.01)	(2.15)
% Other immigrants	0.24	0.24	0.33	0.82
	(0.95)	(0.95)	(0.96)	(0.81)
F-statistic on instrument in the first stage	6.378	6.430	3.840	7.082
P-value	0.000	0.000	0.000	0.000
F-statistic on residuals from the first stage	3.39	3.84	1.17	1.79
P-Value endogeneity test	*0.388*	*0.350*	*0.768*	*0.811*
P-value Ooveridentification test (Sargan)	*0.000*	*0.000*	*0.001*	*0.005*
Number of observations	764	764	764	764

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least two natives and two immigrants were interviewed and at least one immigrant is from a country of birth included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS and the share of the six biggest immigrant groups by municipality. Standard errors in parenthesis are clustered by 65 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

Table A15: OLS and 2SLS results for the reduced sample (at least three observations)

	OLS (1)	2SLS (2)	OLS (3)	2SLS (4)	OLS (5)	2SLS (6)	OLS (7)	2SLS (8)
Immigrants' stock market participation	0.25***	0.58***	0.23**	0.58***	0.15*	0.36*	0.16*	0.36*
	(0.09)	(0.19)	(0.09)	(0.19)	(0.08)	(0.19)	(0.09)	(0.19)
Male	0.08***	0.08***	0.07**	0.07**	0.08***	0.08***	0.08***	0.08**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Middle Education	0.09**	0.09**	0.08*	0.08*	0.08**	0.08**	0.08**	0.08**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
High Education	0.17***	0.16***	0.14***	0.13**	0.14***	0.13***	0.14***	0.13***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Log Income	0.13***	0.12***	0.12***	0.11***	0.12***	0.11***	0.12***	0.11***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
Risk loving			0.24**	0.21**	0.24**	0.22**	0.24**	0.22**
			(0.10)	(0.09)	(0.10)	(0.09)	(0.09)	(0.10)
Employed in financial sector			0.08	0.08	0.05	0.06	0.05	0.06
			(0.09)	(0.09)	(0.10)	(0.09)	(0.10)	(0.09)
Financial literacy not related to stockownership			-0.01	-0.02	-0.03	-0.04	-0.03	-0.03
			(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership			0.10***	0.10***	0.09***	0.09***	0.10***	0.10***
			(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
% of municipality population employed in financial sector					0.64***	0.50**	0.60***	0.45*
					(0.19)	(0.23)	(0.22)	(0.27)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific controls							Yes	Yes
Mean stock market participation	0.223	0.223	0.223	0.223	0.223	0.223	0.223	0.223
First Stage								
Average stock market participation in country of birth		3.10***		3.09***		2.93**		3.72***
		(0.87)		(0.87)		(1.11)		(1.39)
F-statistic on instrument in the first stage		12.64		12.63		6.992		7.178
P-value		*0.001*		*0.001*		*0.011*		*0.010*
F-statistic on residuals from the first stage		4.43		5.28		1.80		1.92
P-Value endogeneity test		*0.040*		*0.025*		*0.186*		*0.171*
Number of observations	709	709	709	709	709	709	709	709

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least three natives and three immigrants were interviewed and at least one immigrant is from a country of birth included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 55 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

Table A16: OLS and 2SLS results for the reduced sample (at least five observations)

	OLS (1)	2SLS (2)	OLS (3)	2SLS (4)	OLS (5)	2SLS (6)	OLS (7)	2SLS (8)
Immigrants' stock market participation	0.34***	0.77***	0.31**	0.75***	0.17	0.45*	0.21	0.50*
	(0.11)	(0.22)	(0.11)	(0.23)	(0.12)	(0.26)	(0.16)	(0.30)
Male	0.08**	0.09***	0.07**	0.08**	0.08***	0.09***	0.09***	0.09**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Middle Education	0.10**	0.10**	0.09*	0.09*	0.09**	0.09**	0.09**	0.08*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
High Education	0.16**	0.15**	0.12**	0.12**	0.12**	0.12**	0.12**	0.12**
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
Log Income	0.13***	0.12***	0.12***	0.11***	0.12***	0.11***	0.12***	0.11***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Risk loving			0.20**	0.16*	0.21**	0.18**	0.20**	0.17
			(0.10)	(0.09)	(0.10)	(0.09)	(0.10)	(0.11)
Employed in financial sector			0.09	0.08	0.06	0.06	0.06	0.06
			(0.11)	(0.10)	(0.11)	(0.10)	(0.11)	(0.10)
Financial literacy not related to stockownership			0.03	0.01	0.00	-0.00	0.00	0.00
			(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)
Financial literacy related to stockownership			0.08**	0.09**	0.08**	0.08**	0.08**	0.08**
			(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
% of municipality population employed in financial sector					0.67***	0.49*	0.62**	0.38
					(0.21)	(0.29)	(0.28)	(0.37)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific controls							Yes	Yes
Mean stock market participation	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
First Stage								
Average stock market participation in country of birth		2.77***		2.73***		2.53**		2.64**
		(0.78)		(0.76)		(1.06)		(0.98)
F-statistic on instrument in the first stage		12.53		12.88		5.669		7.329
P-value		*0.001*		*0.001*		*0.023*		*0.011*
F-statistic on residuals from the first stage		4.27		4.69		1.40		1.43
P-Value endogeneity test		*0.470*		*0.038*		*0.246*		*0.241*
Number of observations	566	566	566	566	566	566	566	566

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least five natives and five immigrants were interviewed and at least one immigrant is from a country of birth included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 33 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

Table A17: OLS and 2SLS results for the reduced sample (at least ten observations available in a municipality for natives and at least five for immigrants)

	OLS (1)	2SLS (2)	OLS (3)	2SLS (4)	OLS (5)	2SLS (6)	OLS (7)	2SLS (8)
Immigrants' stock market participation	0.50***	0.97***	0.49***	0.99***	0.27*	0.62	0.37**	0.72*
	(0.11)	(0.28)	(0.11)	(0.30)	(0.15)	(0.38)	(0.15)	(0.39)
Male	0.11***	0.12***	0.10**	0.11***	0.12***	0.12***	0.12***	0.13***
	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)
Middle Education	0.10*	0.10*	0.09*	0.09*	0.10**	0.10**	0.09*	0.08*
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)
High Education	0.17**	0.16**	0.14*	0.13*	0.14**	0.14**	0.12*	0.11*
	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)
Log Income	0.12***	0.12***	0.12***	0.11***	0.11***	0.11***	0.12***	0.11***
	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)
Risk loving			0.22**	0.19**	0.23**	0.21**	0.21**	0.19*
			(0.09)	(0.08)	(0.09)	(0.09)	(0.09)	(0.11)
Employed in Financial Sector			-0.02	-0.03	-0.05	-0.05	-0.06	-0.05
			(0.11)	(0.10)	(0.12)	(0.11)	(0.12)	(0.09)
Financial literacy not related to stockownership			0.01	-0.02	-0.01	-0.02	-0.00	-0.00
			(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)
Financial literacy related to stockownership			0.09**	0.10***	0.09**	0.10***	0.10**	0.10**
			(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
% of municipality population employed in financial sector					0.73**	0.49	0.51	0.22
					(0.26)	(0.43)	(0.35)	(0.45)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific controls							Yes	Yes
Mean stock market participation	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208
First Stage								
Average stock market participation in country of birth		2.25**		2.23***		1.70*		1.96*
		(0.79)		(0.77)		(0.91)		(0.96)
F-statistic on instrument in the first stage		8.069		8.457		3.493		4.222
P-value		*0.011*		*0.009*		*0.078*		*0.055*
F-statistic on residuals from the first stage		3.33		3.68		0.99		1.63
P-Value endogeneity test		*0.085*		*0.071*		*0.333*		*0.218*
Number of observations	458	458	458	458	458	458	458	458

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least ten natives and five immigrants were interviewed and at least one immigrant is from a country of birth included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 19 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

Table A18: OLS and 2SLS results for the reduced sample (at least ten observations available in a municipality)

	OLS (1)	2SLS (2)	OLS (3)	2SLS (4)	OLS (5)	2SLS (6)	OLS (7)	2SLS (8)
Immigrants' stock market participation	0.41***	0.82***	0.41***	0.82***	0.14	0.32	0.17	0.57
	(0.12)	(0.23)	(0.13)	(0.23)	(0.15)	(0.27)	(0.12)	(0.40)
Male	0.11**	0.12***	0.10**	0.12***	0.12***	0.12***	0.12***	0.13***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.05)
Middle Education	0.08	0.07	0.07	0.06	0.08	0.08	0.08	0.07
	(0.07)	(0.07)	(0.07)	(0.07)	(0.05)	(0.05)	(0.05)	(0.05)
High Education	0.18*	0.17*	0.14	0.12	0.14*	0.14**	0.14*	0.12*
	(0.09)	(0.09)	(0.09)	(0.09)	(0.07)	(0.07)	(0.07)	(0.07)
Log Income	0.15***	0.14***	0.14***	0.13***	0.13***	0.13***	0.14***	0.13***
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
Risk loving			0.14	0.12	0.13	0.13	0.13	0.11
			(0.12)	(0.10)	(0.12)	(0.10)	(0.11)	(0.12)
Employed in Financial Sector			0.02	0.01	-0.01	-0.01	-0.02	-0.01
			(0.12)	(0.11)	(0.13)	(0.12)	(0.13)	(0.09)
Financial literacy not related to stockownership			0.05	0.01	0.02	0.01	0.02	0.02
			(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.09)
Financial literacy related to stockownership			0.11**	0.12***	0.11**	0.12***	0.12**	0.12**
			(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)
% of municipality population employed in financial sector					0.81***	0.69**	0.75**	0.37
					(0.23)	(0.31)	(0.26)	(0.51)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific controls							Yes	Yes
Mean stock market participation	0.226	0.226	0.226	0.226	0.226	0.226	0.226	0.226
First Stage								
Average stock market participation in country of birth		2.98***		2.95***		2.66*		3.02*
		(0.80)		(0.74)		(1.32)		(1.62)
F-statistic on instrument in the first stage		13.92		15.73		4.065		3.473
P-value		*0.002*		*0.002*		*0.065*		*0.085*
F-statistic on residuals from the first stage		3.64		3.95		0.75		5.49
P-Value endogeneity test		*0.079*		*0.068*		*0.403*		*0.036*
Number of observations	351	351	351	351	351	351	351	351

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least ten natives and ten immigrants were interviewed and at least one immigrant is from a country of birth included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 14 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

Table A19: OLS and 2SLS results for the main sample and covariates specified for immigrants as a reference group

	OLS (1)	2SLS (2)	OLS (3)	2SLS (4)
Immigrants' stock market participation	0.12	0.49**	0.10	0.54*
	(0.10)	(0.25)	(0.11)	(0.30)
Male	0.07**	0.06**	0.07***	0.06**
	(0.03)	(0.03)	(0.03)	(0.03)
Middle Education	0.08**	0.07*	0.08**	0.07*
	(0.04)	(0.04)	(0.04)	(0.04)
High Education	0.13***	0.11**	0.13***	0.11**
	(0.05)	(0.05)	(0.05)	(0.05)
Log Income	0.09***	0.08***	0.09***	0.08***
	(0.03)	(0.03)	(0.03)	(0.03)
Risk loving	0.21**	0.18**	0.22**	0.18*
	(0.10)	(0.09)	(0.10)	(0.09)
Employed in Financial Sector	0.11	0.12	0.11	0.12
	(0.09)	(0.09)	(0.09)	(0.09)
Financial literacy not related to stockownership	-0.06	-0.06	-0.06	-0.05
	(0.07)	(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership	0.09***	0.09***	0.09**	0.09***
	(0.03)	(0.03)	(0.03)	(0.03)
% of municipality population employed in financial sector	0.16	-0.07	0.15	-0.03
	(0.17)	(0.22)	(0.17)	(0.22)
% risk loving individuals among immigrants			-0.11	-0.17
			(0.19)	(0.18)
% financially literate individuals among immigrants			0.12	-0.16
			(0.16)	(0.25)
Socio-demographic controls	Yes	Yes	Yes	Yes
Municipality-specific controls	Yes	Yes	Yes	Yes
Mean stock market participation	0.213	0.213	0.213	0.213
First Stage				
Average stock market participation in country of birth		3.02***		2.52***
		(0.96)		(0.79)
F-statistic on instrument in the first stage		9.890		10.17
P-value		*0.002*		*0.002*
F-statistic on residuals from the first stage		3.25		2.70
P-Value endogeneity test		*0.075*		*0.104*
Number of observations	805	805	805	805

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least one immigrant was interviewed and his/her country of birth is included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Reference group specific covariates include municipality population employed in financial sector among immigrants and share of risk loving and financially literate individuals among immigrants. Standard errors in parenthesis are clustered by 83 municipalities. Heteroscedasticity robust Hausman test is in form of auxiliary regression: significant coefficient on the residuals from the first stage suggests endogeneity of the instrumented variable. *** p<0.01, ** p<0.05, * p<0.1.

Table A20: Placebo treatment for the full sample: randomization within regions

Immigrants' stock market participation assigned:	Correctly	Correctly	Randomly	Randomly	Correctly	Correctly	Randomly	Randomly
% of municipal population employed in financial sector assigned:	Correctly	Randomly	Randomly	Correctly	Correctly	Randomly	Randomly	Correctly
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Controlling for individual employment in financial sector				*Not controlling for individual employment in financial sector*		
				OLS				
Immigrants' stock market participation	0.20***	0.23***	0.07	0.03	0.20***	0.24***	0.07	0.02
	(0.07)	(0.08)	(0.08)	(0.08)	(0.07)	(0.09)	(0.08)	(0.08)
% of municipal population employed in financial sector	0.62***	0.30	0.41**	0.72***	0.69***	0.29	0.41**	0.79***
	(0.19)	(0.19)	(0.19)	(0.18)	(0.18)	(0.19)	(0.18)	(0.18)
Employed in financial sector	0.13	0.17**	0.18**	0.13				
	(0.09)	(0.08)	(0.09)	(0.09)				
				2SLS				
Immigrants' stock market participation	0.40**	0.57***	0.33	0.22	0.38**	0.59***	0.34	0.20
	(0.19)	(0.21)	(0.21)	(0.20)	(0.19)	(0.21)	(0.21)	(0.20)
% of municipal population employed in financial sector	0.49**	0.06	0.24	0.60***	0.57**	0.05	0.23	0.69***
	(0.24)	(0.22)	(0.23)	(0.21)	(0.23)	(0.22)	(0.23)	(0.20)
Employed in financial sector	0.14	0.16**	0.18*	0.14				
	(0.08)	(0.08)	(0.09)	(0.09)				
				First Stage				
Average stock market participation in country of birth	2.71***	2.62***	2.68***	2.69***	2.71***	2.63***	2.68***	2.71***
	(0.91)	(0.71)	(0.42)	(0.33)	(0.91)	(0.71)	(0.42)	(0.33)
F-statistic on instrument in the first stage	8.929	13.58	40.08	68.12	8.908	13.70	40.04	68.45
P-value	*0.004*	*0.000*	*0.000*	*0.000*	*0.004*	*0.000*	*0.000*	*0.000*
Number of observations	805	805	805	805	805	805	805	805
Mean stock market participation	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least one immigrant was interviewed and his/her country of birth is included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 83 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

AII. Analysis including social trust

It is well known from the literature that social interactions and trust are important determinants of stock market participation (see, for example, Hong et al. (2004), Guiso et al. (2008), and Guiso et al. (2004)). According to this literature, in the locations with higher levels of trust and social interaction there should be expected higher stock market participation rates through both peer effects and trust to the political institutions. Thus, ceteris paribus, in the municipalities with higher social interaction and trust, the peer effects can be expected to be stronger. One way to test this hypothesis would be to repeat the analysis for the subsamples of natives living in municipalities with high and low levels of trust and interaction. However, given the small size of our sample, such an analysis would most likely fail to deliver precise estimates, and thus credible results, due to the lack of statistical power.

Another way to proceed is to include directly municipality-specific indices of social trust and interaction in the estimated model. This specification would also allow addressing the omitted variable bias concern which might arise when these important determinants of stock market participation are not controlled for. However, in the Eurosystem HFCS information on social trust and interactions was not collected. Therefore, we use data from the European Social Survey (ESS) and the municipality -specific population composition CENSUS weights to construct municipality-specific trust indices. In particular, we use three questions from the ESS, namely whether people can be trusted, and whether such political institutions as parliament and legal system can be trust worthy. We construct the municipality-specific indices in a way similar to how we construct the instrumental variable. That is, we, first, construct country-specific averages using all the available ESS rounds, and then we weight these indices by the population shares at the municipality level.

As can be seen from Table A21 and Table A22 stock market participation and social trust indices at a country and municipality-level are indeed strongly correlated. Moreover, all the three chosen indices are correlated among themselves. It is not surprising therefore, that when using these variables in the regression analysis (Table A23 and Table A24) our main explanatory variable, namely immigrants' stock market participation, does not have predictive power over the natives' stock ownership decision anymore. Moreover, due to such high level of collinearity, the chosen instrument is no longer relevant and the first stage fails to hold.

It is worthwhile noting, however, that the proportion of financially educated peers, defined as neighbours working in the financial sector, is still an important predictor of individual stock market participation decisions.

Thus, this analysis allows us to conclude, that social interactions and trust are indeed important components of stock market participation decision. One possible way of using this information could be to use these indices as additional instrumental variables. This analysis is left for the future research.

Table A21*: Composition of Luxembourg population, stock ownership rates and trust indices by country of birth*

Groups	Country of birth	Population in Luxembourg, %	Risky assets ownership rates in Luxembourg in 2014, %	2010 risky assets ownership rates in country of birth (instrument), %			Trust in:	
				All population	Only natives[a]	People	Country's parliament	Legal system
Natives	Luxembourg	56.96	20.84	24.34	27.60	5.11	5.71	6.14
Main immigrant groups	Portugal	16.08	0.48	6.34	6.13	3.81	3.42	3.80
	France	6.14	22.74	21.23	21.23	4.44	4.30	4.91
	Italy	3.52	21.49	9.24	9.96	4.52	4.24	5.04
	Belgium	3.30	42.84	25.80	27.25	4.98	4.79	4.81
	Germany	2.35	39.20	21.39	23.30	4.74	4.34	5.58
Immigrants from other European countries available in the Eurosystem HFCS dataset	Netherlands	0.76	12.97	22.48	22.48	5.84	5.19	5.70
	Spain	0.71	37.11	13.30	13.30	5.00	4.60	4.39
	Greece	0.30	0.00	3.57	3.68	3.87	3.74	5.07
	Finland	0.21	97.06	38.54	39.20	6.51	5.85	6.96
	Austria	0.15	91.41	12.94	13.73	5.09	4.90	5.97
	Slovakia	0.12	0.00	3.26	3.17	4.05	3.59	3.79
	Slovenia	0.08	0.00	19.69	20.07	4.15	3.80	3.83
	Malta	0.04	na	20.01	19.39	na	na	na
	Cyprus	0.01	na	35.06	37.69	4.08	4.79	5.69

Note: The table reports the composition of the population in Luxembourg by nationality based on the Census 2011 and stock ownership rates in Luxembourg in 2014 based on second wave of the LU-HFCS. In addition, it contains risky asset ownership rates in the country of birth based on the first wave of the Eurosystem HFCS. Data is weighted and multiply imputed. The data on social trust indices is from the European Social Survey, all available rounds for each country. Each index ranges from 0 to 10 where 0 is the minimum trust level. Answers recorded as "Don't know" are dropped.

[a] In France, Spain and the Netherlands, data on ownership rates is computed only for the native population because there is no information on the country of birth/nationality.

Table A22*: Pairwise correlation between immigrants' stock market participation and trust indices at municipality level*

	Immigrants' stock market participation	People trust index	Parliament trust index	Legal system trust index
		Municipality specific trust indices among immigrants		
People trust index	0.456	1.000		
Parliament trust index	0.465	0.993	1.000	
Legal system trust index	0.522	0.955	0.956	1.000
		Municipality specific trust indices defined for all population		
People trust index	0.345	1.000		
Parliament trust index	0.262	0.972	1.000	
Legal system trust index	0.310	0.983	0.993	1.000

Note: The table reports the pairwise correlation coefficients between stock market participation among immigrants and trust indices at municipality level. Stock ownership rates are based on second wave of the LU-HFCS. The data on social trust indices is from the European Social Survey, all available rounds for each country.

Table A23: OLS and 2SLS results including trust indices

	Trust index of municipality defined among:			
	Immigrants		All population	
	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)
Immigrants' stock market participation	0.04	3.45	0.04	-0.98*
	(0.10)	(16.18)	(0.09)	(0.53)
Risk loving	0.21**	0.10	0.21**	0.26**
	(0.09)	(0.80)	(0.09)	(0.11)
Employed in financial sector	0.09	0.14	0.09	0.07
	(0.09)	(0.35)	(0.09)	(0.09)
Financial literacy not related to stockownership	-0.05	-0.13	-0.05	-0.04
	(0.07)	(0.40)	(0.07)	(0.07)
Financial literacy related to stockownership	0.09***	0.08	0.10***	0.11***
	(0.03)	(0.13)	(0.03)	(0.04)
% of municipality population employed in financial sector	0.42*	0.51	0.48**	0.40
	(0.24)	(3.41)	(0.24)	(0.28)
People trust index in municipality	-1.04	3.94	0.85	3.42**
	(0.99)	(34.04)	(0.92)	(1.61)
Parliament trust index in municipality	1.28*	-1.37	1.20	-2.12
	(0.77)	(20.57)	(0.95)	(1.99)
Legal system trust index in municipality	-0.19	-3.28	-1.45*	0.70
	(0.29)	(16.62)	(0.79)	(1.45)
Socio-demographic controls	Yes	Yes	Yes	Yes
Municipality-specific controls	Yes	Yes	Yes	Yes
Mean stock market participation	0.213	0.213	0.213	0.213
First Stage				
Average stock market participation in country of birth		0.15		4.81
		(6.15)		(3.04)
F-statistic of instrument in the first stage		0.001		2.508
P-value		*0.981*		*0.117*
Correlation coefficients between immigrants' stock market participation and:				
People trust index in municipality		0.46		0.34
Parliament trust index in municipality		0.46		0.26
Legal system trust index in municipality		0.52		0.31
Number of observations	805	805	805	805

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least one immigrant was interviewed and his/her country of birth is included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter.The data on social trust indices is from the European Social Survey, all available rounds for each country. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 83 municipalities. *** p<0.01, ** p<0.05, * p<0.1.

Table A24: OLS and 2SLS results including trust indices: by index

	Trust index of municipality defined among:											
	Immigrants						All population					
	OLS (1)	2SLS (2)	OLS (3)	2SLS (4)	OLS (5)	2SLS (6)	OLS (7)	2SLS (8)	OLS (9)	2SLS (10)	OLS (11)	2SLS (12)
Immigrants' stock market participation	0.03	-1.05	0.02	7.96	0.04	-1.08	0.01	-0.22	0.02	-0.01	0.03	0.05
	(0.09)	(2.74)	(0.09)	(47.69)	(0.10)	(2.18)	(0.09)	(0.40)	(0.09)	(0.31)	(0.09)	(0.34)
Risk loving	0.22**	0.28	0.22**	-0.20	0.22**	0.28	0.21**	0.22**	0.21**	0.21**	0.21**	0.21**
	(0.09)	(0.20)	(0.09)	(2.57)	(0.09)	(0.18)	(0.09)	(0.11)	(0.09)	(0.10)	(0.09)	(0.10)
Employed in financial sector	0.09	0.06	0.09	0.27	0.09	0.06	0.09	0.09	0.09	0.09	0.09	0.09
	(0.09)	(0.11)	(0.09)	(1.22)	(0.09)	(0.10)	(0.09)	(0.08)	(0.09)	(0.08)	(0.09)	(0.08)
Financial literacy not related to stockownership	-0.07	-0.04	-0.07	-0.36	-0.07	-0.06	-0.07	-0.06	-0.07	-0.07	-0.07	-0.07
	(0.07)	(0.11)	(0.07)	(1.72)	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Financial literacy related to stockownership	0.09***	0.10**	0.09***	0.04	0.09***	0.10**	0.10***	0.10***	0.10***	0.10***	0.10***	0.10***
	(0.03)	(0.04)	(0.03)	(0.37)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
% of municipality population employed in financial sector	0.42*	0.55	0.40*	-0.86	0.43*	0.32	0.42**	0.49*	0.47**	0.48*	0.46**	0.45*
	(0.22)	(0.46)	(0.22)	(6.41)	(0.23)	(0.47)	(0.21)	(0.25)	(0.21)	(0.25)	(0.21)	(0.25)
People trust index in municipality	0.16	0.70					0.40***	0.57*				
	(0.10)	(1.36)					(0.15)	(0.34)				
Parliament trust index in municipality			0.16*	-3.31					0.23**	0.24		
			(0.09)	(21.42)					(0.09)	(0.16)		
Legal system trust index in municipality					0.10	0.64					0.21**	0.20
					(0.09)	(1.07)					(0.09)	(0.17)
Socio-demographic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality-specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean stock market participation	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213
First Stage												
Average stock market participation in country of birth		2.68		0.77		-1.30		2.71*		2.95**		2.71**
		(5.14)		(7.11)		(2.31)		(1.47)		(1.30)		(1.26)
F-statistic of instrument in the first stage		0.271		0.0118		0.318		3.389		5.177		4.601
P-value		*0.604*		*0.914*		*0.574*		*0.069*		*0.026*		*0.035*
Number of observations	805	805	805	805	805	805	805	805	805	805	805	805

Note: The table reports stock market participation regressions for the sample of natives from the LU-HFCS second wave (2014) in municipalities where at least one immigrant was interviewed and his/her country of birth is included in the first wave of the Eurosystem HFCS dataset. Data is weighted and multiply imputed. The dependent variable is an indicator for whether a household holds stocks or mutual funds. Other socio-demographic controls (not displayed) include age, age squared; household size; marital status (single, widowed, divorced); occupational status (self-employed, unemployed, retired, or other occupation); and an indicator for a foreign-born partner. Municipality-specific controls are dummies for 5 groups of average rental prices in euro/square meter. The data on social trust indices is from the European Social Survey, all available rounds for each country. The instrumental variable is the average participation in countries of birth from the first wave of the Eurosystem HFCS. Standard errors in parenthesis are clustered by 83 municipalities.*** p<0.01, ** p<0.05, * p<0.1.

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Anastasia Girshina
Swedish House of Finance at Stockholm School of Economics, Stockholm, Sweden; email: anastasia.girshina@hhs.se

Thomas Y. Mathä
Banque centrale du Luxembourg, Luxembourg, Luxembourg; email: thomas.mathae@bcl.lu

Michael Ziegelmeyer
Banque centrale du Luxembourg, Luxembourg, Luxembourg; Munich Center for the Economics of Aging;
email: michael.ziegelmeyer@bcl.lu

Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.ecb.europa.eu

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