In and Down: The Immigrant-Native Gap in Portfolio Diversification[†]

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Abstract

Earlier studies find that immigrants participate in the financial market significantly less than the native-born. But do immigrant investors perform equally well? By exploiting a detailed administrative dataset from Sweden, this paper shows that immigrants seem to undertake 37% more return loss than the native. Although there is no evidence showing longer stay in Sweden helps reduce the loss gap, the gap can be causally attributed to natives' informational advantage and high financial literacy. The findings suggest that immigrants should participate in stock market but in a more cautious manner.

Keywords: Diversification, Immigrant-native gap, Portfolio performance

JEL Codes: G11, G41, G50

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1 Introduction

It is no surprise that immigrants are found to participate in local financial market less. Evidence from the United States indicates the participation gap between immigrants and native-borns widely exists across various types of financial activity, including owning checking and savings accounts (Osili and Paulson, 2004), direct investment in stocks (Osili and Paulson, 2008) as well as mutual funds and bonds (Seto and Bogan, 2013). Combined with the traditional viewpoint advocated by economists that one should invest in equity regardless of their risk preference (e.g., Merton, 1969), one implication of these findings is immigrants should participate more in the stock market so that there is no gap between natives and immigrants in participation rate. One question then naturally emerges: do immigrant investors perform equally well as native ones? If not, it would be of interest for policy makers to understand the potential channels of the performance gap in order to better facilitate immigration integration and prevent inequality in wealth accumulation.

Sweden provides an ideal context for answering the question for at least three reasons. First of all, it allows for not only identifying who is in the stock market but re-constructing individual portfolios. Owing to the wealth taxation until 2006, Statistics Sweden (the official statistic authority, also known as its Swedish acronym SCB) collects detailed asset allocation information on an individual basis. This greatly granular dataset carries a unique advantage over survey data in terms of availability to detailed information of asset allocation. Secondly, there are sufficient number of immigrants in Sweden and the SCB allows for connecting investors to the immigration database which records country (or region) of origin and migration year of each immigrant. This feature helps control for country-level characteristics in the empirical analysis. Last but not least, the SCB also records, among others, a list of demographic and socio-economic characteristics that are found to be related to the portfolio performance.

Specifically, this paper uses a cross-section of 2006 because immigrant identity does not change over time and 2006 is the most recent year that the wealth registry functions. The cross-section covers a large sample consisting of 274,075 natives and 13,987 immigrants who were actively

participating in the stock market. The criteria are set so that portfolio's characteristics can be captured and meaningful comparisons can be made, which is further described in the data section. To measure performance in a way that both return and risk are properly considered, I employ the return loss proposed by Calvet et al. (2007) in their seminal work. The loss is an underdiversification measure which results from holding a sub-optimally diversified complete portfolio relative to the benchmark market portfolio, and it can alternatively be interpreted as opportunity cost that investors could have avoided if they had invested in market portfolio instead. The return loss widely exists among Swedish investors; I find that for an average investor in my sample, they loss 1.1% of financial assets every year owing to underdiversification, which is nontrivial and comparable to previous studies outside Sweden (e.g., von Gaudecker, 2015 in the Dutch context).

With the help of the measure, the answer to the research question above seems to be a no. I find that immigrant investors suffer more return loss than their native counterparts, which is robust to various specifications. The baseline result documents a 36 bps (approximately 34%) greater loss for immigrants. In a propensity-score-matching sample, I find the effect to be marginally larger. The gap seems to be widest among investors with high-school-or-below education background, and shrinks as education progresses. However, education in general does not help lower return loss among investors.

I identify two causal channels via which immigration plays a role in affecting the return loss. One channel is that financial literacy level in the country of origin fosters better constructed portfolios. As a country-level proxy for financial literacy, I employ a relatively recent dataset of 2014 Standard & Poor's (S&P's) Global Financial Literacy Survey which covers over 150,000 nationally representative and randomly selected adults from more than 140 economies. [1] Despite of the fact that financial literacy across the globe has improved over time, the current relative level is expected to be highly informative about the historical level. I find that a one-standard-deviation increase in overall financial literacy of the home country leads to 21 bps lower return loss. The other potential channel is the access to information. The financial market

[1] Klapper et al. (2015) present a detailed report on the survey.

is information-sensitive, which requires time and efforts in gathering and processing information about assets. One could only afford collecting and analyzing information on a subset of assets (Merton, 1987). Compared with natives, immigrants face a significantly greater difficulty in acquiring information because of, for instance, language barrier, and they might end up with including sub-optimal assets in their portfolios. Since social interaction spurs information exchange, I examine whether stronger tie to the local society causes better performance. Specifically, I adopt a dummy of having a Swede partner to proxy social interaction and document a positive effect of at least 22 bps. In addition, it is interesting to document that longer duration of stay per se does not seem to reduce the loss. One interpretation could be that, owing to the strong link to the home country, immigrants could not "learn" financial literacy from the natives as the duration of stay extends, despite that Sweden tops the S&P financial literacy survey.

The main contribution is three-way. Firstly, the paper answers an important follow-up question about immigrant investors' performance after entering the local stock market. Earlier studies primarily examine the immigrant-native gap in extensive margin and intensive margin of stock market participation (e.g., Seto and Bogan, 2013), as well as the potential explanations thereof, including institutional quality in immigrant's home country (Osili and Paulson, 2008; Asgharian et al., 2023), cognitive and non-cognitive abilities (Luik and Steinhardt, 2016), culture background (Haliassos et al., 2017; Ek et al., 2023) and proficiency in local language (Gan et al., 2022). However, there is little evidence on the post-entry performance of immigrant's portfolio. The only exception to my knowledge is from Calvet et al. (2007) who include immigrant as a dummy to explain the difference of return loss among Swedish households. Since the study is conducted on household instead of individual level, the gap between immigrants and natives could be underestimated. Second, the paper offers more evidence to the relation between financial literacy and portfolio performance. Li et al. (2020), with the data from a Chinese household survey, conclude that financial literacy does not lead to significantly higher investment returns. I improve the empirical design by using a more proper and objective performance measure. To date, the most relevant research on this issue comes from von Gaudecker (2015) who documents that investors who have a below-median financial literacy and rely primarily

on their own judgements incur 50 bps more return loss in their complete portfolios. By using a setup where there is arguably less variation in the primary source of financial advice among immigrants, I show that the effect of financial literacy is actually significantly positive. Finally, this paper sheds light on the role of information in investment outcome. A large body of studies have documented how social interaction can spur participation in stock market participation via the channel of information diffusion (e.g., Hong et al., 2004; Georgarakos and Pasini, 2011; Kaustia and Torstila, 2011; Changwony et al., 2015). Nevertheless, it remains unclear whether closer access to general financial information improves portfolio performance, and this paper for the first time provides the empirical evidence to answer the question.

The remainder of the paper is organized as follows. Section 2 describes data and provides a overview of the gap, with a special focus on the re-construction of individual portfolios. Section 3 presents the baseline results on the return-loss gap between immigrants and natives. Section 4 illustrates two potential causal channels related to the gap. Finally, Section 5 concludes the paper.

2 Data and Variables

2.1 The Swedish Wealth Registry

The introduction of modern Swedish wealth taxation dates back to 1911, and it was abolished in 2007. From 1992 until the abolishment, the effective tax rate for wealthy individuals remained between 0.5-1 percent.[2] Owing to the existence of the wealth rate, the government's statistical bureau, Statistics Sweden (also known as SCB for its Swedish acronym), carries a parliamentary responsibility for collecting household-level wealth information, regardless whether the household is below or above the threshold of wealth tax. The SCB compiles data from various sources including the Swedish Tax Agency, welfare agencies as well as the private sector during the period of 1999-2006. In April, all taxpayers receive a preliminary tax filing for the previous

[2]I refer readers who are interested to the review of the Swedish wealth taxation by Du Rietz and Henrekson, 2015.

calendar year from the tax agency. The taxpayers review the figures and, if necessary, correct errors before finalizing the tax filing.[3]

All financial assets must be reported properly on an individual basis, including but not limited to bank accounts, stock holdings and fund holdings, domestic and overseas.[4] Each entry of financial asset should also specify the number of shares, if applicable, and it is identified by its International Security Identification Number (ISIN). Furthermore, the wealth registry includes other types of assets, e.g., real estate and pension savings. To sum up, this is an unusually disaggregated database covering all residents in Sweden.

In this study, a cross-section of year 2006 (the last year available for this database) is chosen because of not only the nature of the research question, but the advantage that all bank accounts should be reported in 2006. In comparison, only the bank accounts that receive interest above 100 Swedish Krona (SEK, 1 SEK is approximately 0.1460 USD as of the last trading day in 2006) should be reported. Therefore, it is expected that the wealth registry in 2006 is even more comprehensive and that the effect of dot-com bubble bust has dissipated to a greater extent than the previous years.

2.2 The Universe of Financial Asset

I randomly select 10,000 individuals from the LISA database and screen their financial assets holding. The remaining part in this section largely follows the procedure implemented by Calvet et al. (2007) and von Gaudecker (2015). I keep only equity shares and mutual funds for they are the most accessible financial assets for average investors. For each asset, I collect and calculate its monthly returns from January 1991 (or the inception date) to December 2006, leading to a maximum number of monthly observations of 192 for each asset. For later beta-estimation needs, I drop assets with fewer than 24 monthly returns. Consequently, there are 766

[3]Calvet et al. (2007) provide a more comprehensive introduction on this issue.

[4]One natural concern is the tax agency's coverage on overseas assets. To alleviate the issue, in an unreported setting, I exclude immigrants who were over 20 years old upon arrival in Sweden. The assumption is that those migrating to Sweden before entering the labour market are more likely to open a local investment account, which is within the radar of the tax authority. The results remain highly significant, which is available upon request.

financial assets included in the universe, of which 457 are non-money-market mutual funds, 15 are money-market mutual funds which are considered risk-free and seen as cash holding (c.f. Calvet et al., 2007) and 294 are stocks.

For each asset j, I estimate its expected return by the international CAPM, namely,

$$r^e_{i,t} = \beta_j r^e_{m,t} + \varepsilon_{j,t}, \tag{1}$$

where $r^e_{j,t}$ and $r^e_{m,t}$ are the excess return for the individual asset and market portfolio, respectively. Since Sweden is a small and open economy, the market excess return (the benchmark) is measured as the USD return of the MSCI World Index.[5] The use of the global CAPM implies that the currency-hedged world index is mean-variance efficient from the perspective of a Swedish investor. Over the January 1991 to December 2006 period, the benchmark market portfolio yields an annual excess return of $\mu_b = 4.40\%$. Together with its standard deviation $\sigma_b = 13.2\%$, this implies a Sharpe ratio $S_b = \mu_b/\sigma_b = 33.2\%$.

2.3 The individual sample and their portfolios

I collect individual-level data mainly from the Longitudinal Integrated Database for Health Insurance and Labor Market Studies (also known as LISA in Swedish) provided by the SCB. The database contains, among others, age, gender, city of living, working status, working industry, education background, marital status and total income including labor income as well as capital gains for all residents who are at least 16 years old as of November in each year. The LISA also allows for identification of immigrant, the year of immigration and the original region or country where the immigrant lives, which facilitates the empirical identification.

To ensure sufficient variation in immigrants' demographic characteristics, I start with re-selecting a random sample of 1,000,000 individuals. For each individual in the sample, the value of financial assets is defined as the sum of the market value of risk-free assets in forms of bank account

[5]Under covered interest parity, $r_(m,t)^e$ is also the domestic excess return of the currency-hedged MSCI World Index. Further arguments can be found in the online Appendix by Calvet et al. (2007).

balances and money-market mutual fund holdings and risky assets in forms of non-money-market mutual fund and stock holdings in SEK as of the last trading day in 2006. Following von Gaudecker (2015) in order to ensure that the portfolio holding is financially meaningful, I further restrict the sample to only consist of adults who hold risky assets valued at least 10,000 SEK and whose risky portfolio contains only assets that are available in the asset universe as mentioned in the last section. The final sample covers roughly 290,000 individuals of which about 14,000 are immigrants. Table 1 presents an overview on individual (Panel A) and portfolio (Panel B) characteristics for the whole sample as well as the split sample by immigrant dummy. Documented in Panel A, the group of immigrant investors are younger, more likely to be female, and possess less assets (at least the wealth known to the Swedish tax authority). However, it is worth noting that within the sample, immigrants obtain 15% higher annual all-factor income, which could be explained by their higher overall participation rate in the labor market and better education background.

Now I turn to portfolio-level differences. Given the composition of each individual's financial assets, it is straightforward to calculate the weight vector ω. I then follow the standard procedure to obtain the expected excess return μ_i and the risk σ_i of each individual's risky portfolio, and hence the Sharpe ratio $S_i = \mu_i/\sigma_i$. Together with the benchmark market portfolio, I adopt the following measure of underdiversification loss with proposed by Calvet et al. (2007) which is aimed for complete portfolios,

$$RL_i = \omega_i \cdot (S_b\sigma_i - \mu_i). \tag{2}$$

Panel B of Table 1 documents a big-picture comparison between complete portfolios held by natives and immigrants. On average, the immigrants and the natives put similar weight, slightly over 50%, on risky assets in their complete portfolio. Despite that mutual funds dominate risky portfolios, immigrants are inclined to hold six percentage points more stocks, but four percentage points less funds. Immigrants are also significantly more likely to invest only one stock in their risky portfolio, which is exemplary underdiversification. Taken together, I observe

an over 43% unconditional gap in return loss between immigrants and natives, which motivates further analysis.

[Insert Table 1 around here.]

One, however, may raise the issue that the image of an average immigrant differs significantly from an average native within sample, and these variables all matter for portfolio choice as documented in earlier works (e.g., Calvet et al., 2007). Hence, I control for these key covariates in all the upcoming empirical specifications. Furthermore, I implement a propensity-score matching so that I find no more than two most equivalent natives for each immigrant in the sample. The matching results are presented in Table A1, which consistently indicates a 37% immigrant-native gap in return loss.

3 Empirical strategy

Underdiversification causes welfare losses. To investigate the immigrant-native gap of such return losses, I implement the following model:

$$RL_i = \alpha + \beta Immigrant_i + \gamma' X_i + \varepsilon_i \tag{3}$$

The dependent variable RL_i is the return loss due to the holding sub-optimal portfolio, as defined in Eq. 2.[6] $Immigrant_i$ takes the value of one if the individual is an immigrant, and zero if native-born. The covariate list X_i contains important attributes identified in the literature, including age (quadratic), gender, education, marital status, employment status, log total income as well as log financial assets. In addition, this specification includes residing city fixed effects in order to control for varying information costs across areas. For instance, the exchange of information might be more intensive and frequent in more populated areas.

Column 1 in Table 2 indicates that immigrants on average lose 36 bps more than their native-

[6]The baseline setting use MSCI World Index as the market portfolio. As a robustness check, I re-estimate the model with MSCI Europe Index and obtain largely similar results. See Table A2.

born counterparts, which is approximately 34% greater compared to the benchmark of the native at 107 bps. Given that the amount of financial assets held by an average immigrant is roughly 220,000 SEK, the average excessive return loss is 36 bps * 220,000 SEK = 792 SEK, which is about 115 USD and equivalent to 0.3% of average annual gross income. Although this amount can accumulate via compounding over the life cycle and incur a substantial welfare loss, it worth nothing that participating in the financial market still generates a positive excess return for immigrant investors.

To identify the key contributor to the overall return loss, I take logs of Eq. 2 under the assumption that all terms are positive:

$$\ln RL_i = \ln \omega_i \cdot \ln \left(S_b \sigma_i - \mu_i \right) \tag{4}$$

The first component indicates the aggressiveness of complete portfolio, while the second reflects on the portfolio inefficiency. Columns 2-4 in Table 2 indicate that the inefficiency is the key and sole contributor to the excessive return loss for immigrants, suggesting that their risky portfolios usually have a lower Sharpe ratio and/or are more volatile. [7] The decomposition also shows that immigrants allocate a marginally lower risky share in their complete portfolio, which helps reduce return loss slightly.

Moreover, the baseline result implies return loss tends to be larger for investors who are older, men, holding less financial assets and earning lower salaries. Education does not seem associated with a lower return loss. Compared to the benchmark education level, i.e., high-school or below, individuals who hold a bachelor degree incur larger return loss, whereas those with post-graduate degree have very similar return loss level. As Calvet et al. (2007) suggest, education can have ambiguous effect on return loss in the sense that better educated households tend to select portfolios with a higher Sharpe but also with a higher risky share, eventually leading to a greater return loss.

[7] The results presented in Table A3 indicate that both factors seem significant. Specifically, the annualized volatility of risky component is 2.6 percentage points higher for immigrants, and the Sharpe ratio is 1.2 percentage points lower.

[Insert Table 2 around here.]

Although education could be a double-edged sword, it is expected to contribute to narrow the immigrant-native gap for better educated immigrants usually integrate into local society more efficiently. To test the idea, I augment the baseline specification Eq. 3 by introducing a series of interaction terms of immigrant identity and education. The results are presented in Table 3. Education is found to be positively correlated with return loss among natives. Nevertheless, education shrinks the immigrant-native gap: the difference peaks for high-school-or-below native-immigrant pair at 46.6 bps, gets lower for undergraduate native-immigrant pair at 46.6+6.5-19.2=33.9 bps, and reaches the lowest for post-graduate pair at 46.6+8.6-44.3=10.9 bps. One interpretation could be that better education background facilitates immigrants' integration into the society, which resonate with what I am about to show in the following section.

[Insert Table 3 around here.]

4 What Drives the Gap?

So far, I have documented the gap in return loss between immigrant and native investors, as well as the positive impact of education in shrinking the gap. Using a subsample consisting of only immigrants, this section continues to investigate the potential channels that explain the gap. Before turning to the investigation, it is perhaps interesting to examine whether the duration of stay makes a difference. Intuitively, immigrants who have been living in Sweden longer are expected to behave more like native-borns. I then test the following specification:

$$RL_{ic} = \alpha + \lambda_c + \beta YSA_i + \gamma' X_i + \varepsilon_{ic}, \tag{5}$$

where λ_c captures the country fixed effect, and YSA_i could be either a continuous variable, namely, log of years since arrival, or a categorical dummy of YSA bins. Table 4 suggests that the length of stay alone does not leads to lower return losses, which motivates the upcoming identification of potential affecting channels.

[Insert Table 4 around here.]

4.1 Financial literacy

In a highly relevant study, von Gaudecker (2015) reveals that the investors in the Netherlands in general achieve reasonably effective portfolio outcomes. However, those who have a below-median financial literacy and rely primarily on their own judgements incur 50 bps more return loss. The author then concludes that financial literacy does not seem to play an important role for those who seek external financial advice, and argues that those who have the highest risk of incurring large return losses trust themselves the most, namely, overconfidence seems to matter. I revisit this particular relation between financial literacy and return loss by exploiting a neater setup in the sense that it is generally difficult for immigrants to consult a local financial advisor, leading to less variation in the primary source of financial advice. Put differently, immigrant investors are more likely to depend on their own capabilities to collect and process information related to the financial market. Their financial literacy, in turn, could be proxied by the average level in their country of origin. I therefore adopt the following specification within the immigrant subsample:

$$RL_{ic} = \alpha + \beta FL_c + \gamma' X_i + \varepsilon_{ic} \tag{6}$$

The key variable FL_c measures the fraction of adults who are financially literate in the immigrant's home country c. The list of individual covariates X_i remains largely unchanged compared to Eq. 3, except for the inclusion of the number of years since arrival (c.f. Osili and Paulson, 2008;Gan et al., 2022). Table 5 reports the results. Column 1 suggests that a one-standard-deviation (17 percentage points) increase in the financial literacy proxy leads to 16 bps lower return loss. To enhance the specification, I further add GDP per capita as of 1976 which is 30 years before the studied cross-section to account for country-level variation and capture, for instance, the possibility that immigrants hold disproportionately more assets from their home country in their complete portfolios, reflecting on the so-called home bias identified by Coval

and Moskowitz (1999). It also helps alleviate the concern that financial literacy at country level is merely a reflection on the financial development. Column 2 shows that the effect becomes stronger; a one-standard-deviation (14 percentage points with the new setup, due to a smaller subset of countries with available GDP data) leads to 21 bps lower loss. Once again, I decompose the return loss according to Eq. 4 and present the results across Columns 3-5 which suggest that financial literacy contributes to immigrants' lower return losses by improving the efficiency of their portfolio instead of affecting the aggressiveness.

[Insert Table 5 around here.]

4.2 Access to information

One can easily imagine that immigrants face more obstacle in terms of acquiring general or financial market specific information compared to the natives. Given that the financial market extremely information-sensitive, it is particularly relevant to examine immigrants' access to local information. Previous studies have demonstrated that active participation in local society could bring informational benefits. Hong et al. (2004) find that households who interact more with their neighbors or attend church are more likely to participate in the stock market owing to information-sharing on, e.g., market opportunities. Within this strand of literature, social interaction also includes involvement in local political matters (Kaustia and Torstila, 2011; Bonaparte and Kumar, 2013), involvement in social groups (Georgarakos and Pasini, 2011; Changwony et al., 2015) and religious beliefs (Renneboog and Spaenjers, 2012). I do not have access to those information owing to the nature of administrative data. However, in a similar spirit, I propose a straightforward alternative for immigrants' social interaction, namely, whether an immigrant has a native partner.[8] This proxy is expected to be highly correlated with immigrant's Swedish proficiency, the access to local news about financial market, and the capability of processing information thereof. These features all imply less informational obstacles, thus better investment outcomes. I therefore alter the baseline specification by introducing the native-partner dummy:

[8]This includes registered partnership, cohabitation and civil marriage.

$$RL_i = \alpha + \beta Native\_partner_i + \gamma' X_i + \varepsilon_i \tag{7}$$

The list of control variables X_i remains the same as in Eq. 6. Column 1 in Table 6 shows that immigrants who have a native partner do experience 35 bps lower return loss, compared to those living with another immigrant partner. One may suspect that some immigrants from a certain group of countries (e.g., other Scandinavian countries) are more likely to live with a native partner, due to, for instance, culture and language similarities, and they generally face lower risk of experiencing excessive return loss regardless of the nationality of their partner. Controlling for country-of-origin fixed effects seems to be a remedy to this concern, of which the result is shown in Column 2; more intensive social interaction brings 22 bps lower return loss on average. Columns 3-5 decompose the return loss and reveal that the reduction in return loss is solely from improvement in the portfolio's Sharpe ratio. Taken together, having a native spouse leads to a better-constructed portfolio.

[Insert Table 6 around here.]

Nevertheless, the finding could be driven by learning from the native partner's higher financial literacy instead of improvements in information collection and processing. This concern seems particularly valid given that Sweden is one of the most financially literate countries according to the S&P's Global Financial Literacy Survey and there are 71% adults are considered financially literate. To ease this issue, I manage to construct a "control" group consisting of immigrants whose partner is from Canada (68% financial literacy rate), Israel (68%), United Kingdom (67%), Germany (66%) or Netherlands (66%). I do not include Nordic countries in this control group for the same reason stated above. The "treatment" group naturally includes all immigrants who have a Swede partner. The idea is that immigrants can learn very similar financial literacy from their partners of all these countries, but they differ in the proximity to local information. I re-run the regression Eq. 7 with the two groups and obtain similar but slightly smaller effect of 17 bps after controlling country fixed effects, as presented in Table A4. Hence, I can rather safely conclude that the access to information indeed plays a role in determining investors'

portfolio performance.

5 Conclusion

Should immigrants participate the financial market to the similar extent as their native counterparts, despite the excessive unfamiliarity? Previous studies have not delivered a clear answer, but implied a positive suggestion. With a highly disaggregated administrative dataset, this paper finds that there indeed exists a portfolio performance gap between immigrants and natives. The gap, measured by underdiversification loss, seems to be large; immigrant investors incur 37% (or 34 bps) more losses than the natives. The title summarizes this finding well, those immigrants who are "in" are also "down". However, the loss is not devastating in the sense that participation in the financial market still provides a positive excess return to the immigrant investors.

The paper also identifies two casual channels; better access to information and higher financial literacy are found to be beneficial in reducing the return loss, which carry policy implications. For instance, a more immigrant-friendly trading platform could be leveraged to increase immigrant's welfare. In addition, immigrant-specific guidance could be made available in trading platforms as well as banks before they enter the financial market. Immigrants should eventually invest in stock market for wealth growth, but they need to do that more consciously.

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Table 1: Summary of individual variables

This table presents a summary of demographic and socio-economic characteristics of the sampled individuals (Panel A), as well as the features of their complete portfolios (Panel B). A complete portfolio must consist of at least one risk-free asset and one risky asset. Return loss is defined by Eq. 2. The last column %Diff is calculated by the difference between the two means divided by the mean of natives. The stars indicate the t-test significance. *p<0.1, **p<0.05, ***p<0.01.

Variable	Full Sample (N=288,062)		Natives (N = 274,075)	Immigrants (N=13,987)	%Diff
	Mean	Std. dev.	Mean	Mean	
Panel A: Individual characteristics					
Age	48.816	17.411	49.144	42.399	-13.72%***
Male	0.47	0.499	0.472	0.429	-9.27%***
Married	0.495	0.5	0.494	0.517	4.74%***
Financial assets (SEK)	255,495	394,425	257,311	219,897	-14.54%***
Real estate assets (SEK)	870,072	2,133,340	871,417	843,703	-3.18%
Total assets (SEK)	1,207,844	2,338,358	1,210,752	1,150,865	-4.95%***
Net wealth (SEK)	929,763	2,162,322	938,477	758,998	-19.12%***
Total income (SEK)	248,747	161,308	246,898	284,967	15.42%***
Education					
High-school or below	0.64	0.48	0.648	0.468	-27.77%***
Undergraduate	0.349	0.477	0.342	0.494	44.46%***
Postgraduate	0.011	0.104	0.01	0.038	292.94%***
Employment status					
Unemployed	0.065	0.247	0.064	0.097	51.43%***
Retired	0.2	0.4	0.208	0.048	-77.08%***
Employed	0.679	0.467	0.673	0.791	17.60%***
Self-employed	0.056	0.229	0.055	0.064	16.45%***
Panel B: Complete portfolio characteristics					
Risky share (%)	0.529	0.302	0.528	0.549	3.83%***
Stock share (%)	0.096	0.203	0.093	0.156	68.34%***
Fund share (%)	0.434	0.319	0.436	0.393	-9.90%***
# of assets	2.973	2.224	2.983	2.769	-7.17%***
# of stocks	0.76	1.252	0.759	0.791	4.26%***
# of funds	2.212	1.868	2.224	1.978	-11.07%***
Only one asset	0.291	0.454	0.288	0.347	20.44%***
Only one stock	0.055	0.228	0.052	0.118	129.54%***
Only one fund	0.236	0.424	0.236	0.228	-3.40%***
Portfolio Sharpe ratio	0.241	0.046	0.242	0.229	-5.62%***
Return loss (%)	1.088	1.282	1.065	1.529	43.56%***

Table 2: The gap in return loss and its contributors

This table presents the results of the OLS regression specified in Eq. 2. Column 1 documents the baseline result, and Columns 2-4 exhibit the result of decomposition according to Eq. 4. Income refers to all-factor annual income including both labor and capital incomes. Education is a three-category dummy, and the benchmark is education of high-school or below. Employment is a four-category dummy of which the benchmark is unemployment. *p<0.1, **p<0.05, ***p<0.01.

VARIABLES	(1) Return Loss	(2) ln(Return Loss)	(3) ln(Agressiveness)	(4) ln(Inefficiency)
Immigrant	0.3570***	0.1529***	-0.0333***	0.1862***
	(0.011)	(0.008)	(0.006)	(0.006)
Age	0.0200***	0.0061***	-0.0054***	0.0115***
	(0.001)	(0.001)	(0.001)	(0.001)
Age-square	-0.0002***	-0.0000***	0.0001***	-0.0001***
	(0.000)	(0.000)	(0.000)	(0.000)
Male	0.2783***	0.2018***	0.0154***	0.1865***
	(0.005)	(0.004)	(0.003)	(0.003)
Married	0.0052	0.0360***	0.0232***	0.0128***
	(0.005)	(0.004)	(0.003)	(0.003)
Log(Fin assets)	-0.3265***	-0.3330***	-0.2877***	-0.0453***
	(0.002)	(0.002)	(0.001)	(0.001)
Log(Income)	0.0098**	-0.0189***	-0.0717***	0.0528***
	(0.004)	(0.003)	(0.003)	(0.002)
Education				
Undergrad	0.0544***	0.0811***	0.0627***	0.0184***
	(0.005)	(0.004)	(0.003)	(0.003)
Postgrad	0.0255	0.0905***	0.0956***	-0.0051
	(0.022)	(0.017)	(0.013)	(0.012)
Employment				
Retired	-0.0732***	-0.0453***	-0.0339***	-0.0114
	(0.013)	(0.010)	(0.008)	(0.007)
Employed	-0.1263***	-0.0529***	0.0054	-0.0583***
	(0.010)	(0.008)	(0.006)	(0.005)
Self-employeed	-0.0400***	-0.0902***	-0.1732***	0.0831***
	(0.014)	(0.010)	(0.008)	(0.007)
Constant	4.2910***	3.4047***	3.1223***	-4.3228***
	(0.033)	(0.025)	(0.020)	(0.018)
Observations	288,062	288,062	288,062	288,062
City FE	Yes	Yes	Yes	Yes
Adj R-square	0.096	0.150	0.180	0.051

Table 3: The gap and education

This table presents the results of the augmented specification based on Eq. 2. A list of interaction terms between education and immigrant dummies are added. Column 1 documents the baseline result, and Columns 2-4 exhibit the result of decomposition according to Eq. 4. Income refers to all-factor annual income including both labor and capital incomes. Education is a three-category dummy, and the benchmark is education of high-school or below. Employment is a four-category dummy of which the benchmark is unemployment.
*p<0.1, **p<0.05, ***p<0.01.

VARIABLES	(1) Return Loss	(2) ln(Return Loss)	(3) ln(Aggressiveness)	(4) ln(Inefficiency)
Immigrant	0.4662***	0.2190***	0.0092	0.2098***
	(0.016)	(0.012)	(0.009)	(0.008)
Education				
Undergrad	0.0645***	0.0872***	0.0668***	0.0204***
	(0.005)	(0.004)	(0.003)	(0.003)
Postgrad	0.0856***	0.1272***	0.1137***	0.0135
	(0.024)	(0.018)	(0.015)	(0.013)
Education × Immigrant				
Undergrad × Immi.	-0.1921***	-0.1161***	-0.0769***	-0.0392***
	(0.022)	(0.016)	(0.013)	(0.012)
Postgrad × Immi.	-0.4429***	-0.2703***	-0.1409***	-0.1294***
	(0.060)	(0.045)	(0.036)	(0.032)
Observations	288,062	288,062	288,062	288,062
Individual controls	Yes	Yes	Yes	Yes
City FE	Yes	Yes	Yes	Yes
Adj R-square	0.096	0.150	0.180	0.052

Table 4: Return losses and length of stay

This table documents the result from Eq. 5. YSA refers to years since arrival in Sweden for immigrants. Column 1 uses YSA as a continuous variable, while Column 2 adopts a list of group dummies distinguished by the YSA. Individual controls include the following: age (quadratic), gender, marital status, income which refers to all-factor annual income including both labor and capital incomes, education and employment status. Education is a three-category dummy, and the benchmark is education of high-school or below. Employment is a four-category dummy of which the benchmark is unemployment.
*p<0.1, **p<0.05, ***p<0.01.

VARIABLES	(1) Return Loss	(2) Return Loss
Log(YSA)	0.0038	
	(0.027)	
Benchmark: YSA 1-4 yrs		
5-9 yrs		0.0705
		(0.070)
10-14 yrs		-0.0150
		(0.094)
15-19 yrs		-0.0782
		(0.075)
20-24 yrs		0.1169
		(0.071)
25-30 yrs		-0.0016
		(0.078)
Observations	10,561	10,561
Individual controls	Yes	Yes
City FE	Yes	Yes
Country FE	Yes	YES
Adj R-square	0.123	0.123

Table 5: Return losses and country-of-origin financial literacy

With the subsample consisting of only immigrants, this table presents the results of the OLS regression specified in Eq. 6. Columns 1 and 2 document the baseline result, and Columns 3-5 exhibit the result of decomposition according to Eq. 4. Financial literacy is obtained from S&P's Global Survey, and measures the fraction of financially literate adults in a given country. Income refers to all-factor annual income including both labor and capital incomes. Education is a three-category dummy, and the benchmark is education of high-school or below. Employment is a four-category dummy of which the benchmark is unemployment. The YSA stands for years since arrival in Sweden. The GDP refers to the per capita GDP as of 1976 in the home country.
*p<0.1, **p<0.05, ***p<0.01.

VARIABLES	(1) RL	(2) RL	(3) ln(RL)	(4) ln(Aggress.)	(5) ln(Ineff.)
Financial Literacy	-0.0095***	-0.0151***	-0.0065***	0.0008	-0.0073***
	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)
Age	0.0597***	0.0525***	0.0117	-0.0275***	0.0392***
	(0.012)	(0.012)	(0.008)	(0.005)	(0.005)
Age-square	-0.0006***	-0.0006***	-0.0001	0.0003***	-0.0004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Male	0.4730***	0.4789***	0.3048***	0.0155	0.2893***
	(0.046)	(0.050)	(0.034)	(0.019)	(0.022)
Married	0.1546***	0.1504***	0.1171***	0.0549**	0.0622***
	(0.045)	(0.054)	(0.028)	(0.021)	(0.023)
Log(Fin assets)	-0.4496***	-0.4502***	-0.3668***	-0.3241***	-0.0427***
	(0.029)	(0.034)	(0.015)	(0.015)	(0.009)
Log(Income)	0.0388	0.0451	0.0110	-0.0424***	0.0535***
	(0.026)	(0.031)	(0.021)	(0.011)	(0.016)
Education					
Undergrad	-0.0777	-0.0544	0.0262	0.0204	0.0058
	(0.048)	(0.056)	(0.027)	(0.014)	(0.023)
Postgrad	-0.3987***	-0.3310***	-0.1493**	-0.0218	-0.1276***
	(0.068)	(0.079)	(0.059)	(0.060)	(0.045)
Employment					
Retired	0.0361	0.0957	0.0560	-0.1585***	0.2145***
	(0.115)	(0.113)	(0.074)	(0.058)	(0.069)
Employed	-0.3496***	-0.3011***	-0.1340***	-0.0632*	-0.0708**
	(0.060)	(0.072)	(0.043)	(0.033)	(0.033)
Self-employeed	0.0310	0.1118	-0.0632	-0.2017***	0.1386**
	(0.136)	(0.157)	(0.097)	(0.054)	(0.056)
Log(YSA)	0.0019	0.0094	0.0175	0.0090	0.0085
	(0.024)	(0.024)	(0.019)	(0.020)	(0.015)
Log(GDP)		0.0820*	0.0324*	-0.0031	0.0355
		(0.045)	(0.017)	(0.015)	(0.023)
Constant	5.6870***	5.3521***	3.6836***	3.7849***	-4.7064***
	(0.392)	(0.389)	(0.176)	(0.193)	(0.166)
Observations	10,541	8,290	8,290	8,290	8,290
City FE	Yes	Yes	Yes	Yes	Yes
Adj R-square	0.111	0.115	0.152	0.211	0.097

Table 6: Return losses and access to information

With the subsample consisting of only immigrants who have a partner, this table presents the results of the OLS regression specified in Eq. 7. Column 1 documents the baseline result, column 2 controls furthermore for home-country fixed effects, and Columns 3-5 exhibit the result of decomposition according to Eq. 4. $Nativepartner$ is a binary dummy taking the value of one if the immigrant's partner is native-born, and zero otherwise. Income refers to all-factor annual income including both labor and capital incomes. Education is a three-category dummy, and the benchmark is education of high-school or below. Employment is a four-category dummy of which the benchmark is unemployment. The YSA stands for years since arrival in Sweden.
*p<0.1, **p<0.05, ***p<0.01.

VARIABLES	(1) RL	(2) RL	(3) ln(RL)	(4) ln(Aggress.)	(5) ln(Ineff.)
Native partner	-0.3530***	-0.2176***	-0.1003***	-0.0076	-0.0927***
	(0.056)	(0.045)	(0.027)	(0.017)	(0.020)
Age	0.0213	0.0181	0.0154	0.0056	0.0097
	(0.016)	(0.017)	(0.011)	(0.007)	(0.009)
Age-square	-0.0003*	-0.0002	-0.0002	-0.0000	-0.0001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Male	0.5503***	0.4997***	0.2933***	0.0052	0.2882***
	(0.062)	(0.054)	(0.033)	(0.023)	(0.017)
Log(Fin assets)	-0.4463***	-0.4493***	-0.3558***	-0.3142***	-0.0416***
	(0.034)	(0.033)	(0.017)	(0.014)	(0.011)
Log(Income)	0.0271	0.0662**	0.0568***	-0.0202	0.0770***
	(0.031)	(0.027)	(0.018)	(0.017)	(0.012)
Education					
Undergrad	-0.1819***	-0.1646***	-0.0477**	0.0179	-0.0656***
	(0.051)	(0.038)	(0.022)	(0.019)	(0.018)
Postgrad	-0.4061***	-0.3710***	-0.1489***	0.0034	-0.1523***
	(0.097)	(0.086)	(0.050)	(0.052)	(0.050)
Employment					
Retired	-0.2118	-0.1590	0.0012	0.0296	-0.0285
	(0.136)	(0.133)	(0.083)	(0.052)	(0.076)
Employed	-0.5524***	-0.4837***	-0.2492***	-0.0794**	-0.1698***
	(0.070)	(0.068)	(0.040)	(0.036)	(0.034)
Self-employed	-0.1837	-0.1602	-0.1465**	-0.1662***	0.0197
	(0.123)	(0.122)	(0.072)	(0.051)	(0.048)
Log(YSA)	0.0855**	0.0202	0.0095	-0.0138	0.0233
	(0.034)	(0.033)	(0.022)	(0.017)	(0.014)
Constant	6.5636***	6.3517***	3.3851***	2.8546***	-4.0747***
	(0.635)	(0.616)	(0.331)	(0.242)	(0.251)
Observations	7,958	7,957	7,957	7,957	7,957
R-squared	0.149	0.175	0.195	0.212	0.143
City FE	Yes	Yes	Yes	Yes	Yes
Country of origin FE	No	Yes	Yes	Yes	Yes
Adj R-square	0.119	0.138	0.159	0.176	0.104

A Appendix - tables

Table A1: Summary of individual variables within matched sample

The sample adopted in this table is obtained through propensity-score matching (PSM) on age, gender, marital status, education, employment, income and total assets. The PSM aims at matching up to two nearest neighbors. Otherwise the setting is identical to Table 1.

Variable	Natives (N = 25,745)	Immigrants (N=13,987)	%Diff
	Mean	Mean	
Panel A: Individual characteristics			
Age	42.215	42.399	0.43%
Male	0.434	0.429	-1.18%
Married	0.501	0.517	3.28%***
Financial assets (SEK)	213,510	219,897	2.99%*
Real estate assets (SEK)	864,530	843,703	-2.41%
Total assets (SEK)	1,141,943	1,150,865	0.78%
Net wealth (SEK)	797,455	758,998	-4.82%**
Total income (SEK)	262,589	284,967	8.52%***
Education			
High-school or below	0.483	0.468	-2.93%***
Undergraduate	0.487	0.494	1.43%
Postgraduate	0.03	0.038	23.49%***
Employment status			
Unemployed	0.091	0.097	6.52%*
Retired	0.05	0.048	-4.31%
Employed	0.797	0.791	-0.70%
Self-employed	0.062	0.064	2.87%
Panel B: Complete portfolio characteristics			
Risky share (%)	0.548	0.549	0.08%
Stock share (%)	0.094	0.156	66.23%***
Fund share (%)	0.454	0.393	-13.60%***
# of assets	3.017	2.769	-8.20%***
# of stocks	0.71	0.791	11.41%***
# of funds	2.307	1.978	-14.24%***
Only one asset	0.28	0.347	23.94%***
Only one stock	0.048	0.118	149.18%***
Only one fund	0.232	0.228	-1.72%
Portfolio Sharpe ratio	0.243	0.229	-5.83%***
Return loss (%)	1.119	1.529	36.62%***

Table A2: Robustness check: The gap in return loss

The benchmark market portfolio is MSCI Europe Index, instead of MSCI World Index in the baseline setting. Otherwise the specification is the same as in Table 2
*p<0.1, **p<0.05, ***p<0.01.

VARIABLES	(1) Return Loss	(2) ln(Return Loss)	(3) ln(Agressiveness)	(4) ln(Inefficiency)
Immigrant	0.4426***	0.1211***	-0.0333***	0.2333***
	(0.014)	(0.008)	(0.006)	(0.007)
Age	0.0229***	0.0038***	-0.0054***	0.0139***
	(0.001)	(0.001)	(0.001)	(0.001)
Age-square	-0.0002***	-0.0000***	0.0001***	-0.0001***
	(0.000)	(0.000)	(0.000)	(0.000)
Male	0.3566***	0.1686***	0.0154***	0.2029***
	(0.006)	(0.003)	(0.003)	(0.003)
Married	0.0134**	0.0346***	0.0232***	0.0018
	(0.007)	(0.004)	(0.003)	(0.003)
Log(Fin assets)	-0.4791***	-0.3311***	-0.2877***	-0.0736***
	(0.003)	(0.002)	(0.001)	(0.001)
Log(Income)	-0.0102*	-0.0277***	-0.0717***	0.0618***
	(0.006)	(0.003)	(0.003)	(0.003)
Education				
Undergrad	0.0769***	0.0747***	0.0627***	0.0041
	(0.007)	(0.004)	(0.003)	(0.003)
Postgrad	0.0389	0.0838***	0.0956***	-0.0086
	(0.029)	(0.016)	(0.013)	(0.015)
Employment				
Retired	-0.1024***	-0.0434***	-0.0339***	-0.0160*
	(0.017)	(0.009)	(0.008)	(0.009)
Employed	-0.1548***	-0.0390***	0.0054	-0.0710***
	(0.013)	(0.007)	(0.006)	(0.007)
Self-employed	-0.0800***	-0.1062***	-0.1732***	0.0811***
	(0.018)	(0.010)	(0.008)	(0.009)
Constant	6.7435***	4.0273***	3.1223***	-4.4098***
	(0.043)	(0.023)	(0.020)	(0.022)
Observations	288,062	288,062	288,062	288,062
City FE	Yes	Yes	Yes	Yes
Adj R-square	0.112	0.165	0.180	0.045

Table A3: Agressiveness and Imperfection

The specification embedded to this table is largely similar to Eq. 3. The only difference is the dependent variable: Column 1 examines the volatility of investor's risky portfolio, which is measured by the annualized standard deviation of monthly excess returns, while Column 2 does with the Sharpe ratio.
*p<0.1, **p<0.05, ***p<0.01.

	(1)	(2)
VARIABLES	Volatility	Sharpe ratio
Immigrant	0.0259***	-0.0124***
	(0.001)	(0.000)
Age	0.0014***	-0.0008***
	(0.000)	(0.000)
Age-square	-0.0000***	0.0000***
	(0.000)	(0.000)
Male	0.0248***	-0.0088***
	(0.000)	(0.000)
Married	0.0029***	0.0014***
	(0.000)	(0.000)
Log(Fin assets)	-0.0050***	0.0030***
	(0.000)	(0.000)
Log(Income)	0.0067***	-0.0028***
	(0.000)	(0.000)
Education		
Undergrad	0.0030***	0.0003
	(0.000)	(0.000)
Postgrad	-0.0059***	-0.0027***
	(0.002)	(0.001)
Employment		
Retired	-0.0018*	0.0013***
	(0.001)	(0.000)
Employed	-0.0074***	0.0048***
	(0.001)	(0.000)
Self-employed	0.0110***	-0.0022***
	(0.001)	(0.001)
Constant	0.1834***	0.2501***
	(0.002)	(0.001)
Observations	288,062	288,062
City FE	Yes	Yes
Adj R-square	0.047	0.038

Table A4: Robustness check: Return losses and access to information

The sample only contains immigrants whose partner is either native-born or from Canada, Israel, United Kingdom, Germany and Netherlands. Other details can be found in the notes stated in 6
*p<0.1, **p<0.05, ***p<0.01.

VARIABLES	(1) RL	(2) RL	(3) ln(RL)	(4) ln(Aggress.)	(5) ln(Ineff.)
Native partner	-0.1981***	-0.1678**	-0.1089**	-0.0035	-0.1054**
	(0.063)	(0.070)	(0.049)	(0.031)	(0.042)
Age	0.0216	0.0384*	0.0224	0.0022	0.0201
	(0.023)	(0.021)	(0.015)	(0.012)	(0.014)
Age-square	-0.0002	-0.0004	-0.0002	0.0001	-0.0002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Male	0.3875***	0.3520***	0.2207***	-0.0105	0.2312***
	(0.091)	(0.081)	(0.054)	(0.044)	(0.031)
Log(Fin assets)	-0.3869***	-0.3851***	-0.3501***	-0.3083***	-0.0418**
	(0.040)	(0.040)	(0.023)	(0.018)	(0.018)
Log(Income)	0.0697	0.0927*	0.0606**	-0.0437**	0.1043***
	(0.050)	(0.047)	(0.028)	(0.019)	(0.022)
Education					
Undergrad	-0.1977***	-0.1685***	-0.0326	0.0150	-0.0476*
	(0.061)	(0.059)	(0.039)	(0.027)	(0.026)
Postgrad	-0.3113**	-0.2729**	-0.0478	0.0283	-0.0761
	(0.129)	(0.120)	(0.066)	(0.058)	(0.076)
Employment					
Retired	-0.0788	-0.0438	0.0170	-0.0850	0.1020
	(0.215)	(0.209)	(0.152)	(0.141)	(0.164)
Employed	-0.3698***	-0.3532**	-0.1241	0.0098	-0.1339**
	(0.134)	(0.140)	(0.077)	(0.065)	(0.060)
Self-employed	-0.1679	-0.1737	-0.1452	-0.2125***	0.0673
	(0.200)	(0.198)	(0.114)	(0.073)	(0.079)
Log(YSA)	0.0891**	0.0667*	0.0433	0.0206	0.0226
	(0.039)	(0.038)	(0.027)	(0.025)	(0.028)
Constant	5.1055***	4.4992***	2.8208***	2.8176***	-4.6019***
	(0.846)	(0.740)	(0.529)	(0.382)	(0.464)
Observations	3,399	3,392	3,392	3,392	3,392
R-squared	0.156	0.200	0.228	0.250	0.160
City FE	Yes	Yes	Yes	Yes	Yes
Country of origin FE	No	Yes	Yes	Yes	Yes
Adj R-square	0.096	0.124	0.155	0.179	0.080