



Immigrants and natives' financial decision making: Evidence from Türkiye

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ABSTRACT

This study investigates the causal effects of Syrian migrants on the financial behavior of natives in Türkiye. Utilizing a comprehensive administrative data set, we employ a two-stage least square (2SLS) estimation technique that isolates causal effects by exploiting substantial exogenous variation in the share of migrants relative to natives, arising from the geographical proximity to Syrian governorates of a specific province. Results indicate that immigrants have no significant overall effects on the financial decisions of natives. We find no conclusive evidence that migrant influx promotes overall stock market participation at both extensive and intensive margins. Moreover, our investigation reveals a minimal variation in direct stock ownership or the wealth invested in stocks. We observe neither economically nor statistically significant effects on the share of natives holding bonds or funds. Additionally, no discernible impact of migrants on the wealth per capita invested in bonds, funds, and the overall stock market emerges. However, we find limited evidence suggesting that migrants contribute to an increase in the share of wealth invested in stocks, albeit with a corresponding decrease in the share of wealth allocated to funds. Lastly, we explore the heterogeneity in the effects of immigrants by gender, but our findings reveal no significant variation by gender.

1. Introduction

The global waves of immigrants and refugees witnessed in the last decade have raised concerns about their potential economic and social consequences. The economics of migration literature provides an in-depth analysis of the economic effects of immigrants, focusing on various outcomes such as native labor market outcomes, economic growth, and overall price levels. An important component of today's economic activities is the individual's financial investment behavior. The financial behavior of natives may be affected by various channels of migrant stock. Should native individuals experience job displacement due to immigration, it could have negative impacts on financial investments, both at the extensive and intensive margins. On the other hand, with the increasing overall economic activities, there could be positive effects on native labor market outcomes (especially on formal employment), thereby fostering positive effects on financial investments. These two opposing labor market channels may offset each other if one does not dominate the other. In addition to the increase in overall economic activities, if immigrants are cheap labor (which is the

case under the informality in the labor market), it may increase firms' performance and consequently the wealth of the firm owners. These potential channels, with their complex interplay, may effectuate alterations in the financial investment behavior of native populations.

This article examines the causal effects of migrants on the financial behavior of natives in Türkiye from 2006 to 2019, using a novel administrative data set covering the investment decisions of the native population across provinces annually provided by Borsa Istanbul (BIST) Group. Eliciting the causal relationship between migrant stock and the financial behavior of natives is a challenging task since the empirical analysis requires comprehensive data and a plausibly exogenous variation in migrant stock. Utilizing the exogenous variation in the share of migrants relative to natives stemming from the geographical proximity to Syrian governorates of a certain province, for the first time in the literature, we document the causal impacts of migrant supply on the financial decisions of natives.

We find that the migrants have limited effects on the financial behavior of natives. The point estimates indicate that natives tend to take more risk by investing in stocks directly at both extensive and

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intensive margins. Yet, the point estimates are small in magnitude despite their statistical precision. In other words, results show that a one percentage point increase in the share of the migrant population increases the percentage of natives holding direct stock ownership by almost one basis point. However, we find neither economically nor statistically significant effects on the share of natives holding bonds or funds as well as stock market participation through investing any financial assets traded in the stock exchange.

After presenting the estimates related to the outcomes at the extensive margin, we consistently find evidence that a one percent increase in the share of migrants raises the per capita investment in stocks by 1.4 Turkish Lira which is precise but not a large value. On the other hand, our estimates reveal no impact of migrants on the wealth per capita invested in bonds, funds, and the overall stock market. Finally, our results show limited evidence that the migrants led to an increase in the share of wealth invested in stocks but a decrease in the share of wealth invested in funds. Together with the null effects on the share of wealth invested in bonds and small values estimated for stocks and funds, we conclude that migrant stock is at best a minor factor affecting the financial behavior of natives. We also examine whether the migrant stock has heterogeneous effects by gender on the native population in their financial decisions. Yet, point estimates are small and no significant differences between females and males appear.

To measure the impacts of migrant stock on native financial behavior, we use a novel data set provided by Borsa Istanbul Group, which annually provides comprehensive statistical information on the financial behavior of natives at the province level. Besides, we use annual official numbers of migrants in provinces published by the Ministry of Interior Directorate General for Migration Management (DGM) weekly reports. Our sample period covers the years 2006–2019. To quantify the impacts of migrant stock on the financial behavior of natives, we exploit the variation in the ratio of migrants relative to the native population over time and across provinces in Türkiye amid the Syrian humanitarian crisis.

To isolate the causal migrant effects, we exploit a substantial exogenous variation in the migrant supply induced by the proximity to the Syrian governorates of a certain province. Taking advantage of this exogenous variation, we adopt a two-stage least squares (2SLS) strategy that instruments the ratio of refugees with a distance-based instrument exploiting the variation in total migrant stock in Türkiye over time and geographical proximity to the source Syrian governorates. The identifying assumption of our 2SLS method is that controlling province and year fixed effects, the distance-based instrument only affects the financial outcomes of natives through the ratio of migrants, simply asserts that our instrumental variable (IV) is not dependent on the trends preceding the refugee inflows which are the humanitarian consequences of Syrian Civil War. To support the validity of our identifying assumption, we perform a set of robustness checks.

Our study contributes to several strands of literature. Prior research with a focus on Türkiye has examined the effects of migrants on several outcomes. Various studies explore the impacts of the migrant stock on labor market outcomes (Ceritoglu et al. (2017), Aksu et al. (2022), and Öztekin (2021)), education (Tumen (2019, 2021), Kırdar et al. (2023), and Çakır et al. (2023)), crime (Kırdar et al. (2022), Maghularia and Uebelmesser (2023), Kayaoglu (2022), and Akbulut-Yuksel et al. (2023)), health outcomes (Aygün et al. (2021), and Erten et al. (2023)), marriage (Öztekin (2022)) domestic violence (Erten and Keskin (2021)), firm dynamics (Akgündüz et al. (2023)), and environment (Aksoy and Tumen (2021)). We build on literature as our outcome is a quite different outcome. To the best of our knowledge, no study has examined the causal impacts of migrant stock on the financial behavior of natives. Our results suggest that the financial behavior of natives does not vary by migrant stock.

Existing literature has focused on various determinants of limited stock market participation Gomes et al. (2021). Consistently, a large body of literature relates the labor market dynamics with the financial

outcomes (Knupfer et al. (2017), Guiso et al. (1996), Betermier et al. (2012) and Massa and Simonov (2006)). More precisely, labor income risk arising from adverse or positive shocks on unemployment is a major factor determining stock market participation. Considering the small negative impacts on the propensity of informal employment for natives and null effects on total employment (Aksu et al. (2022)), it might be possible to argue that the labor market effects of migrant stock are not expected to affect the financial behavior of natives. Indeed, our results are in line with this as the point estimates are small but statistically significant. Moreover, a vast majority of studies relate culture to financial behavior (Guiso et al. (2006), Carroll et al. (1994), and Hal-lassos et al. (2017)). On the one hand, a set of studies examines the variation in financial behavior among migrants (Osili and Paulson (2008)), on the other hand, Girshina et al. (2019) study the effects of migrant stock on the financial behavior of natives, which our study is most closely related to. Yet, our study departs from it in two respects. First, our results suggest small impacts of migrants, unlike the sizeable effects documented in Girshina et al. (2019). Secondly, our study sample is completely unique in terms of the intensity of refugee influx rather than a selective highly skilled and small amount of migrant population in Luxembourg, which might be driving our results. Overall, we contribute to the literature by showing that migrants are not likely to drive the financial behavior of natives through the labor market and cultural channels.

Finally, our study contributes to the burgeoning literature on migrants and their effects since our empirical methodology starkly differs from the existing studies. Assessing the impact of immigrants on various outcomes requires a credible research design. The primary consideration in this context pertains to the correct specification for the econometric analysis. The existing literature predominantly employs two functional forms: the ratio equation and the logarithmic equation. While the former regresses the outcome of interest in the refugee share, the latter applies the same analysis to the natural logarithm of both dependent and explanatory variables. For both equations, accurately defining the exposure to the treatment is essential. In instances where a continuous impact measure for the treatment exists, the functional form assumes a decisive role. In this regard, the logarithm of the intensity parameter introduces unpredictable consequences. The natural logarithm transforms the exposure to the treatment and smooths the effect, which may lead to misleading inferences. The second concern arises from the so-called “Ratio Problem” as put forward by Kronmal (1993). Numerous studies employ per capita measures, dividing both dependent and independent variables by a common denominator. This manipulation results in a common divisor problem, inducing spurious correlations in certain analyses. In immigration studies, the common divisor typically is the native or resident population in a province at time t . Apart from the common divisor issue, these per capita measures with a time-varying denominator suffer from an additional endogeneity problem. The native population in the denominator may also be affected by the incoming immigrants. Following Bleakley (2010), we address these issues by using the pre-crisis population as the denominator. To the best of our knowledge, this study is the first attempt to clarify the results of immigration studies (especially in Türkiye).

The remainder of the article is organized as follows. In the next section, we briefly introduce the Syrian Refugee Shock. Sections 3 and 4 present the data and render the research design with a particular emphasis on how we identify the causal impacts of migrant stock on the financial behavior of natives. Sections 5 and 6 document the results and robustness checks, respectively. In Section 7, we conclude the article with an overall discussion of the results.

2. Syrians in Türkiye

After the spread of the Arab Spring to Syria, the country entered a devastating civil war. Türkiye hosted the first Syrian refugees in the second half of 2011. Fig. 1 depicts the number of Syrians in Türkiye since

January 2012. The ongoing civil war led to an increase in the number of Syrian refugees, reaching 150,000 at the end of 2012. Right after the refugee influx, the Turkish government first accommodated the refugees at school buildings and government guest houses as a temporary solution to address the humanitarian crisis. Yet, as the number increased, the government began to build refugee camps in border provinces. Barely all Syrians were living in the camps in 2012. In mid-2013 the number of Syrians was about 300,000 and camps were no longer capable of responding to the needs of the refugees. Consequently, Syrians first moved to the Southeastern provinces of Türkiye, then steadily spread to other provinces in the country. By the end of 2013, the total number of Syrian refugees reached to 560,000 whereas by the end of 2014, there were 1.5 million Syrians in Türkiye and the number of refugees reached 2.5 million, 3 million, and 3.5 million in 2015, 2016, and 2017, respectively. Since early 2018, about 3.6 million Syrians have been living in Türkiye.

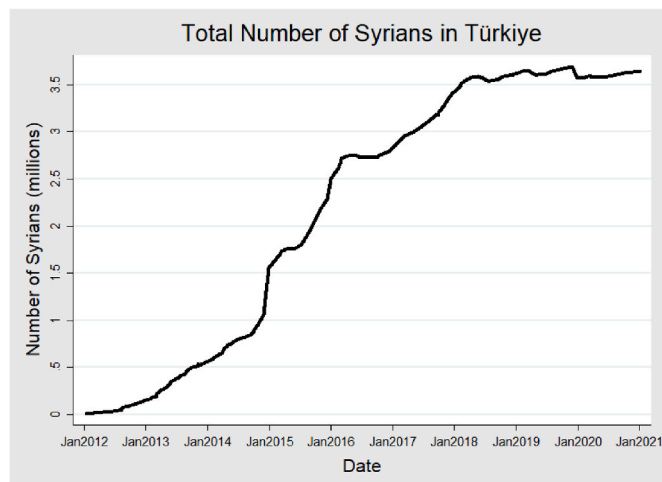
As of the end of 2019, only 2% of the total Syrian refugees have been living in camps. The rest spread throughout different parts of the country and live by their own means. Although most of the Syrians have been living in provinces close to the Syrian border, a substantial part of them is present in metropolitan areas such as İstanbul, Ankara, İzmir and Bursa. Yet, the number of refugees relative to the local population is very small for the provinces away from the border. Fig. 2 presents the ratio of Syrian refugees in Türkiye by province. The Syrians are densely populated in the provinces on the border. The ratio is at the highest (81%) for the province of Kilis, and similarly, it is high in other provinces close to the border.

Our analysis exploits the heterogeneous distribution of refugees within the country. The variation in refugee ratio allows us to compare provinces with a high ratio of Syrians, to those with a low refugee share. In our estimations, we use all provinces to demonstrate the causal effects of refugees on financial behavior.

3. Data

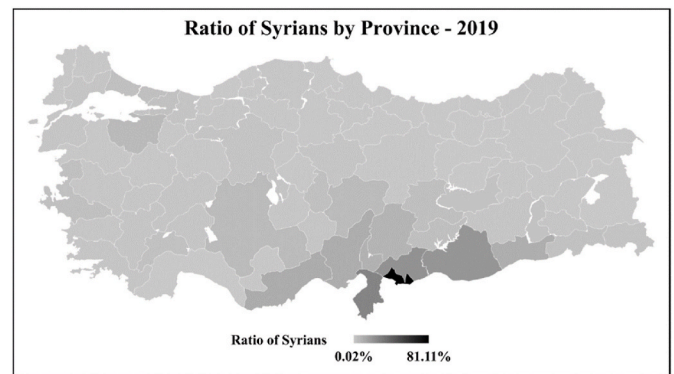
The primary data we employ in our study comes from the year-end books of Borsa Istanbul Group, which provides detailed information about financial behavior at the province level. The corresponding data is unusually comprehensive so it includes the number of investors holding different types of assets, the amount of investment in each asset category, and the portfolio composition of provinces. As our sample period is between 2006 and 2019 on an annual basis, we combine the year-end statistics from 2006 to 2019 to conduct our analysis.

Data on the number of refugees is obtained from the Ministry of Interior Directorate General for Migration Management (DGM) weekly



Source: UNHCR

Fig. 1. Total number of Syrians in Türkiye.



Source: Directorate General of Migration Management

Fig. 2. The ratio of Syrians to the province population.

reports. Even though most of the Syrian refugees are registered under “Temporary Protection” status, there is a significant Syrian population living with a “Residence Permit”. According to the Address Based Population Registration System (ABPRS), 115,000 Syrians are residing with a residence permit in 2019. To reinforce the validity of estimates, we use the total number of Syrians living in each province of Türkiye. The number of Syrian residence permit holders is taken from TurkStat annual population data by country of origin.

Table 1 reports the descriptive statistics for the outcomes and the measure of interest. To quantify the refugee effects on financial behavior, we compute the percent ratio of Syrian refugees relative to the native population in 2011 (pre-crisis). Basically, we are interested in three categories of outcomes related to financial behavior. First, using the ratio of people participating in the stock market and holding certain asset classes we test whether the refugees cause any change at the extensive margin (Panel A). The way we generate the concerning variables is as follows: for the stock market participation ratio we divide the number of people participating in the stock market by the population in 2011. Similarly, for the variables of the ratio of investing in stocks, bonds, or funds, we divide the number of people holding those assets by the population number in 2011.

Consistently, we proceed with examining the refugee effects at the intensive margin, thus in (Panel B) we are involved in the amount of wealth invested in the stock market and distinct financial assets in per capita terms. For each outcome of interest, as our data allows us to identify the total amount invested in a province in a year into different

Table 1
Descriptive statistics.

Variables	Pre-Shock Period			Post-Shock Period		
	N	Mean	SD	N	Mean	SD
Panel A: Ratio of People Holding (%)						
Stock Market Asset	486	4.83	3.11	648	5.31	2.66
rowhead						
Stocks	486	1.32	0.86	648	1.44	0.85
Bonds	486	0.026	0.067	648	0.19	0.12
Funds	486	3.49	2.29	648	3.67	1.81
Panel B: Wealth per Capita Invested in						
Stock Market Asset	486	616.2	629.0	648	1485.9	1573.9
Stocks	486	290.1	367.8	648	705.9	803.4
Bonds	486	12.3	32.6	648	230.0	215.0
Funds	486	313.8	263.2	648	535.9	584.0
Panel C: Share of Wealth Invested in (%)						
Stocks	486	40.2	11.1	648	43.6	9.14
Bonds	486	1.56	3.35	648	16.8	5.66
Funds	486	58.2	11.9	648	38.7	7.88

Notes: The table displays the mean and standard deviation of primary outcomes and the main measure of interest. The data is from the year end reports of Borsa Istanbul.

asset classes, we divide the total amount invested in a certain asset class or in the stock market wholly by the 2011 population. Finally, we examine whether there exist any refugee effects in the portfolio decisions. Therefore, we calculate the share of wealth (Panel C) invested in distinct assets by considering the financial portfolios of provinces.

4. Research Design and Identification

Our baseline equation is as follows:

$$\frac{Y_{ct}}{Natives_{2011}} = \beta \frac{Refugees_{ct}}{Natives_{2011}} + \theta_c + \tau_t + \varepsilon_{ct} \quad (1)$$

where c and t stand for provinces and years, respectively. Y denotes various financial outcomes of interest, $Refugees_{ct}$ is the total number of Syrians in province c in year t , $Natives_{2011}$ is the native population in province c in 2011. The parameter of interest β represents the gradient of a concerning financial outcome with respect to the ratio of number of refugees relative to the native population in 2011. We add θ_c and τ_t for province and year fixed effects, respectively. In our main specification, we also control for region-specific year fixed effects and baseline outcome variable interacted with year dummies to account for region-specific trends and pre-trends in the outcome of interest, respectively. Finally, ε_{ct} is the idiosyncratic term. All regressions are weighted by province resident population in 2011. To allow for correlation in error terms over time within provinces, we cluster standard errors at the province level.

The conflict in Syria started in mid-2011, but Türkiye received the first Syrians as of the end of 2011. Therefore, we use 2012 as the time of treatment. To measure the effect of refugees on the financial behavior of natives, we exploit the variation over time and across provinces in the share of refugees. The non-random location choice of refugees is a threat to the validity of estimates. To address such endogeneity concerns, we exploit the substantial exogenous variation in the migrant stock brought about by the proximity to Syrian governorates of a certain province. More precisely, in a two-stage least squares (2SLS) strategy, we instrument the ratio of refugees with a distance-based instrument exploiting the variation in total migrant stock in Türkiye over time and geographical proximity to the source Syrian governorates. Our strategy follows the distance-based instrumental variable suggested in the existing literature (Del Carpio and Wagner (2016)).

OLS assumes that the regressor variables are exogenous. If any regressor is correlated with the error term, then we have an endogeneity problem. If the refugees' choices of provinces are affected by some other concerns (i.e., not exogenous), then the OLS estimates will be biased, and one should apply the method of instrumental variables to carry out statistical inference. After the Syrian crisis, the Turkish government constructed refugee camps and placed early immigrants in these refugee camps. Refugee camps are generally located in border provinces, and several of them are very close to the border. However, there are also some refugee camps in non-border provinces (Kahramanmaraş, Malatya, Adana, and Adıyaman) as well. If the government built these camps due to the location choice of the refugees, that would pose a potential endogeneity problem. After June 2013, refugee camps were no longer capable of hosting all Syrians, and refugees spread all over the country. Clearly, the location choice of refugees after 2013 is endogenous and the number of refugees is prone to measurement error. We test endogeneity and reject the null hypothesis that the refugee population is exogenous at conventional significance levels. Therefore, we employ a distance-based instrument to deal with endogeneity. We have 81 provinces in Türkiye and there are 13 different governorates in Syria. By using Google Maps, we calculate the travel distance from each province in Türkiye to each governorate in Syria. Then by using refugee numbers and travel distances, we construct our instrument as follows:

$$IV_{ct} = \sum_{s=1}^{13} \frac{\pi_s T_t}{d_{cs}} \quad (2)$$

where T_t is the total number of refugees living in year t . Distance parameter d_{cs} is the travel distance from province c in Türkiye to region s in Syria. The share of Syrians living in region s in Syria (in 2011) is denoted by π_s . The instrument deflates the total number of Syrians by the distance between each province in Türkiye and each governorate in Syria.

Our identifying assumption is that conditional on province and year-fixed effects the distance-based instrument only operates by affecting the ratio of refugees while impacting the outcomes, which also implies that it is not correlated with pre-shock trends in the outcomes. To support that our identifying assumption holds, we employ a randomization inference exercise by generating placebo refugee shares across provinces over years 1000 times. Following the Fisherian randomization inference framework, we first simulate the share of refugees and test the null hypothesis that there is no refugee effect on our outcomes that we find statistically significant impact against the alternative hypothesis of the estimated impacts are by chance. For any outcomes the refugees have an impact on, we reject the null hypothesis, allowing us to conclude that the concerning estimates are causal and not by coincidence. Overall, our results, nonetheless small in magnitude, reveal the causal impacts of the refugees on financial outcomes.

Our main explanatory variable significantly differs from the prior research which constructs the corresponding explanatory variable to quantify the refugee effects in two ways. The first set of studies (Kirdar et al. (2022), and Jaitman and Machin (2013)) exploits a variable computed by dividing the number of refugees by the number of natives in a year in a province. Yet, this measure of interest is prone to the divisor bias or ratio bias proposed by Kronmal (1993), leading to biased estimates of the refugee effects on any outcome. A second superiority of our explanatory variable relative to the ratio variable with the number of natives in the denominator lies in the fact that it is likely the correct way of defining the exposure of a province to the refugee inflows given that the refugee inflows might impact the number of natives, which is obviously an endogenous regressor.

Furthermore, the second set of studies (Akbulut-Yuksel et al. (2023), and Spenkuch (2014)) measures the refugee effect by using the logarithm of the number of refugees and subsequently most of them transform their outcome of interest into a logarithmic scale. Nonetheless, this sort of specification in words log-log regression highly likely tends to suffer from specification form error. It is also hard to know what the log-log specification measures and the concerning regressions produce. Addressing these concerns is the rationale behind why we adapt a specification with the refugee ratio relying on the pre-refugee inflows period native population. By doing so, our estimates do not tend to have the issue of the ratio bias and the possible bias arising from misspecified functional form. Overall, the form of our explanatory variable is completely different from the existing studies to avoid any complications arising from the ratio bias or misspecified functional form.

5. Results

We begin our analysis by documenting the point estimates in Panel A in Table 2 for the outcomes indicating the ratio of ownership for various assets, i.e., the percentage ratio of people holding corresponding stock market assets to the population in 2011. The first row presents the point estimates for the percentage ratio of those holding any stock market assets. Results show that there is no evidence that the refugees significantly impact stock market participation through any stock market assets. The concerning point estimate is sensitive to the specification as well as the addition of extra control variables in regressions. Note that our main specification is the one reported in column 4 for each outcome of interest. Correspondingly, the point estimate is neither economically

Table 2
The causal estimates on financial outcomes.

Outcome	(1)	(2)	(3)	(4)	OLS (4)	Sample Mean
Panel A: Ratio of People Holding (%)						
Stock Market Assets	0.043 (0.039)	0.040** (0.019)	0.024*** (0.009)	0.001 (0.007)	−0.002 (0.007)	5.106
Stocks	0.008 (0.005)	0.013*** (0.004)	0.011** (0.005)	0.009** (0.004)	0.004 (0.003)	1.39
Bonds	0.000 (0.002)	0.005 (0.004)	0.001 (0.002)	0.002 (0.002)	0.001 (0.001)	0.122
Funds	0.036 (0.039)	0.021 (0.016)	0.012 (0.010)	−0.011 (0.009)	−0.008 (0.008)	3.594
Panel B: Wealth per Capita Invested in						
Stock Market Assets	−71.476* (40.337)	−8.407* (4.718)	−7.623 (5.108)	1.310 (1.518)	−0.124 (1.337)	1113
Stocks	−31.272 (19.394)	0.757 (3.165)	0.403 (3.091)	1.380* (0.768)	−0.773 (1.179)	527.7
Bonds	−14.272** (7.038)	−2.228* (1.301)	−2.913** (1.305)	−0.693 (0.978)	0.058 (0.623)	136.7
Funds	−24.553* (13.191)	−6.663*** (1.878)	−5.215*** (1.610)	−0.757 (0.822)	−0.218 (0.584)	440.7
Panel C: Share of Wealth Invested in (%)						
Stocks	0.301* (0.178)	0.114 (0.129)	0.145 (0.121)	0.238* (0.144)	0.075 (0.113)	42.16
Bonds	−0.080 (0.072)	0.011 (0.109)	0.004 (0.109)	0.031 (0.105)	0.044 (0.07)	10.25
Funds	−0.268 (0.178)	−0.150** (0.071)	−0.163*** (0.060)	−0.272*** (0.074)	−0.141** (0.066)	47.04
First Stage F-stat	49.88	54.25	38.90	39.09	–	
Observations	1134	1134	1134	1134	1134	
12 Region Time Trend	NO	YES	NO	NO	NO	
12 Region-Year FE	NO	NO	YES	YES	YES	
Baseline × Year Interaction	NO	NO	NO	YES	YES	

Notes: Two Stage Least Square (2SLS) estimates in all columns. All columns use data of province-level data assembled by Borsa Istanbul Group. The unit of analysis is provinces. The main explanatory variable is the ratio of refugee population to 2011 native population in percentage terms in a province. Panel A documents the point estimates for the ownership rate of various stock market assets. Panel B reports the point estimates for the wealth per capita in Turkish Lira invested in a province in various stock market assets. Panel C displays the point estimates for the share of wealth invested in percentages in a province in various stock market assets. In row 1 in Panel A, the outcome is the ratio of people owning any stock market asset in a province, in row 2, 3, and 4 the outcome is the ratio of people owning stocks, bonds, and funds in percentage terms, respectively. In row 1 in Panel B, the outcome is the wealth per capita invested in Turkish Lira in any stock market asset in a province, in row 2, 3, and 4 the outcome is the wealth per capita invested in stocks, bonds, and funds, respectively. In row 1 in Panel C, the outcome is the share of wealth invested in stocks in percentage in a province, in row 2, and 3 the outcome is the share of wealth invested in bonds, and funds, respectively. In all regressions, we add province and year fixed effects. In column 2, regressions include region (12-NUTS1) specific linear time trends whereas in column 3 controls for region (12-NUTS1) specific year effects. In column 4, regressions also control for province trend interacted with the pre-refugee level (in year 2010) of concerning outcome variable. Column 5 presents the OLS estimates for the fourth 2SLS specification. The last column reports the sample average. F-stat reports the first stage F-stat for each specification. Standard errors are clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

significant nor statistically precise. Row 2 displays how an increase in the refugee population relative to the native population in 2011 affects the proportion of those holding direct stocks in their financial portfolios. Point estimates reveal that a one percentage point increase in the share of the refugee population fosters direct stock ownership by around one basis point. Despite the statistical precision, the magnitude of the point estimate is small, revealing no significant effect overall. In the last two rows, we report the impact of the refugee population on bond and fund ownership. Estimates divulge no significant impacts in both outcomes of interest. Overall, we conclude that at the extensive margin, it is hard to argue that the share of the refugee population substantially impacts stock market participation and asset ownership.

After quantifying the impacts of the share of the refugee population on stock market participation and asset ownership, we proceed with reporting the causal point estimates regarding the wealth per capita invested in the stock market and concerning stock market assets. In other words, our point estimates in Panel B in Table 2 document the causal effects of the refugee population at the intensive margin for the former outcomes. Yet, estimates imply imprecise impacts on the wealth per capita invested in overall stock market assets despite the economic significance of the point estimate. Moreover, in row 2 we document that a one percent increase in the share of the refugee population contributes to the amount invested in stocks in per capita terms. The concerning

point estimate precisely suggests that a one percent increase in the refugee share leads to an increase of 1.4 Turkish Lira in per capita terms. Since the sample mean of that value is 527.7 Turkish Lira, it turns into 0.02% improvement relative to the sample mean. Yet, there is no robust refugee impact on the wealth invested in either bonds or funds as the point estimates are both indistinguishable from zero and small. Altogether, we find limited evidence that the share of the refugee population improves the amount invested in stocks similarly it has no overall significant impact on the amount invested in other categories of assets traded in the stock market.

We continue to document how the share of the refugee population changes the portfolio composition. To make it clear, we are involved in whether an increase in the refugee population relative to the native population in 2011 shifts the share of wealth invested between distinct stock market assets. Row 1 in Panel C displays the causal estimates of the share of the refugee population in 2011 on the share of wealth invested directly in stocks, which might be treated as a riskier assets compared to bonds and funds. Considering column 4, our results reveal that a one percent increase in the share of the refugee population raises the share of wealth invested in stocks by around twenty-four basis points. On the one hand, the coefficient of interest has a statistical precision at the conventional level of significance of 10%. On the other hand, we conclude that the size of the estimated coefficient is small as the contribution is

0.006 relative to the sample mean.

Yet, we find no significant evidence that the refugee population affects the share of wealth invested in bonds. In the last row, we report the causal estimates of the share of the refugee population for the share of wealth invested in funds. Point estimates show that a one percent increase in the share of the refugee population relative to the native population in 2011 led to a twenty-seven-basis point decline in the share of wealth invested in funds. Yet, the point estimates are small despite the statistical significance. The underlying reason why we treat the point estimate as small lies in the fact that comparing it with the sample mean reveals an improvement of 0.006. Taking into account the positive estimated coefficient for the share of wealth invested in stocks, it is plausible to argue that the concerning finding is a sign of a shift in investment decisions from less risky assets to riskier ones through investing more in stocks but a minor movement. All in all, our findings seemingly suggest that the refugee population is at best a minor factor in changing investment decisions through portfolio composition with a shift favoring the riskier assets.

We also check whether the share of the refugee population has heterogeneous impacts on financial behavior by gender as the prior research suggests that the impacts of Syrian refugee shocks differ (Öztek, 2021). Additionally, since the wealth accumulation is heterogeneous by gender, so the financial decisions and risk-taking behavior. To do this, we report the estimates in Table 3 in sub-samples by gender. Results indicate a strong qualitative heterogeneity by gender. An important implication of our estimates is that an increase in the refugee population inhibits the amount of wealth invested in overall stock market assets operating through less investment in stocks for females while the opposite effects are present for males. Relative to the sample mean, it leads to a one percent decline given that a one percentage point increase in the refugee population. In other words, females tend to invest less in stocks than male counterparts, implying a gender heterogeneity at the intensive margin. Considering Panel C, even if females invest less in stocks, they, perhaps a risk compensation, shift their remaining investment from funds to stocks. The estimated coefficients correspond to an increase of over one percent in the stock share and a half percent decline in the fund share relative to the sample mean, respectively. Therefore, it is possible to argue that an increase in the refugee population causes females to shift their wealth from funds to stocks despite a decline in the amount of investment for stocks, showing that female financial behavior moves to riskier strategies or portfolio dynamics more than males. Taken together, our findings suggest that females marginally take more risk than males as the refugee population increases in a province (see Table 3).

6. Robustness Checks

6.1. Alternative IV

Prior research also uses an alternative instrument that relies on the past settlement patterns for Arabs (Erten and Keskin (2021)), which is a common instrumental variable in migration literature (Altonji and Card (1991), and Card (2001)). The 1965 population census has the mother tongue information for resident population, allowing us to use the Arabic speaking population distribution in 1965 to predict existing settlement patterns of the Syrian Refugees in Türkiye. Namely, we construct our alternative instrument as follows:

$$IV_{ct}^{Alternative} = \frac{Arabic_{c,1965}}{Total\ Arabic_{1965}} T_t \quad (3)$$

where $Arabic_{c,1965}$ is the number of Arabic speaking population in province c and $Total\ Arabic_{1965}$ is the total number of Arabic speakers in Türkiye in 1965. We multiply the distribution of the Arabic speakers with the total numbers of refugees living in year t ; T_t

Exploiting the alternative instrument, we re-run our main

Table 3

The causal estimates on financial behavior by gender.

Outcome	Male	Female	Means - Male/Female
Panel A: Ratio of People Holding (%)			
Stock Market Assets	0.004 (0.011)	-0.002 (0.005)	6.86/3.34
Stocks	0.015** (0.008)	0.002* (0.001)	2.06/0.71
Bonds	0.004 (0.004)	-0.000 (0.001)	0.13/0.1
Funds	-0.017 (0.013)	-0.005 (0.004)	4.66/2.52
Panel B: Wealth per Capita Invested in			
Stock Market Assets	2.406 (1.522)	-1.096** (0.540)	812.2/301
Stocks	1.809** (0.807)	-0.429*** (0.154)	419/108.7
Bonds	-0.189 (0.583)	-0.504 (0.436)	89.21/47.47
Funds	-0.705 (0.547)	-0.052 (0.300)	297.2/143.5
Panel C: Share of Wealth Invested in (%)			
Stocks	0.224 (0.140)	0.287** (0.144)	46.14/27.58
Bonds	0.038 (0.092)	0.037 (0.142)	8.96/14.95
Funds	-0.251*** (0.077)	-0.359*** (0.131)	44.3/57.03
Observations	1134	1134	

Notes: Two Stage Least Square (2SLS) estimates in all columns. All columns use data of province-level data assembled by Borsa Istanbul Group. The unit of analysis is provinces. The main explanatory variable is the ratio of refugee population to 2011 native population in percentage terms in a province. Panel A documents the point estimates for the ownership rate of various stock market assets. Panel B reports the point estimates for the wealth per capita invested in Turkish Lira in a province in various stock market assets. Panel C displays the point estimates for the share of wealth invested in percentages in a province in various stock market assets. In row 1 in Panel A, the outcome is the ratio of people owning any stock market asset in a province, in row 2, 3, and 4 the outcome is the ratio of people owning stocks, bonds, and funds in percentage terms, respectively. In row 1 in Panel B, the outcome is the wealth per capita invested in Turkish Lira in any stock market asset in a province, in row 2, 3, and 4 analogously the outcome is the wealth per capita invested in stocks, bonds, and funds, respectively. In row 1 in Panel C, the outcome is the share of wealth invested in stocks in percentage in a province, in row 2, and 3 the outcome is the share of wealth invested in bonds, and funds, respectively. We add province, year and 12-NUTS1 specific year effects fixed effects. Regressions control for province trend interacted with the pre-refugee level (in year 2010) of concerning outcome variable. The last column reports the sample average. Samples are divided by gender as the column title displays. Standard errors are clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

specification for our financial outcomes. Table 4 displays the output of our regressions with alternative IV. Our estimates are in line with the estimates stemming from the distance-based instrument as the concerning point estimates are small. So, the results with the alternative instrument variable indicate that our original and primary point estimates are not sensitive to the different specifications employing alternative instruments. Taken together, our results are robust to employing a different instrumental variable.

6.2. Randomization Inference

In this part, we perform a randomization inference exercise to show that the estimated impacts despite their small values are the true refugee effects on financial outcomes. To do this, we randomly assign the distance instrument 1000 times, leading to a placebo distance instrument in each sample. More precisely, for each outcome of interest for which we report statistically significant coefficients, we generate 1000 random samples in which we randomly assign the distance instrument over

Table 4
The causal estimates on financial outcomes (alternative IV).

Outcome	(1)	(2)	(3)	(4)	OLS (4)	Sample Mean
Panel A: Ratio of People Holding (%)						
Stock Market Assets	0.009 (0.016)	0.013 (0.009)	0.008 (0.009)	−0.012 (0.008)	−0.002 (0.007)	5.106
Stocks	0.011** (0.006)	0.017*** (0.004)	0.017*** (0.005)	0.015*** (0.005)	0.004 (0.003)	1.39
Bonds	−0.003*** (0.001)	−0.002 (0.002)	−0.004** (0.002)	−0.004 (0.002)	0.001 (0.001)	0.122
Funds	0.001 (0.016)	−0.002 (0.009)	−0.004 (0.009)	−0.024*** (0.009)	−0.008 (0.008)	3.594
Panel B: Wealth per Capita Invested in						
Stock Market Assets	−32.659* (16.790)	−3.734 (4.341)	−2.311 (4.605)	−0.455 (2.323)	−0.124 (1.337)	1113
Stocks	−11.533 (8.809)	4.198 (2.750)	5.140* (2.807)	1.211 (1.350)	−0.773 (1.179)	527.7
Bonds	−7.783** (3.059)	−2.653** (1.074)	−2.861** (1.134)	−1.074 (1.126)	0.058 (0.623)	136.7
Funds	−12.712** (4.963)	−5.143*** (1.295)	−4.596*** (1.374)	−1.240 (0.855)	−0.218 (0.584)	440.7
Panel C: Share of Wealth Invested in (%)						
Stocks	0.334*** (0.084)	0.307*** (0.094)	0.356*** (0.119)	0.557*** (0.146)	0.075 (0.113)	42.16
Bonds	−0.221*** (0.079)	−0.240*** (0.077)	−0.273*** (0.098)	−0.241** (0.102)	0.044 (0.07)	10.25
Funds	−0.138 (0.114)	−0.086 (0.105)	−0.098 (0.118)	−0.297*** (0.089)	−0.141** (0.066)	47.04
First Stage F-stat	36.95	30	20.01	20.87	–	
Observations	1134	1134	1134	1134	1134	
12 Region Time Trend	NO	YES	NO	NO	NO	
12 Region-Year FE	NO	NO	YES	YES	YES	
Baseline × Year Interaction	NO	NO	NO	YES	YES	

Notes: Two Stage Least Square (2SLS) estimates in all columns. All columns use data of province-level data assembled by Borsa Istanbul Group. The unit of analysis is provinces. The main explanatory variable is the ratio of refugee population to 2011 native population in percentage terms in a province. Panel A documents the point estimates for the ownership rate of various stock market assets. Panel B reports the point estimates for the wealth per capita in Turkish Lira invested in a province in various stock market assets. Panel C displays the point estimates for the share of wealth invested in percentages in a province in various stock market assets. In row 1 in Panel A, the outcome is the ratio of people owning any stock market asset in a province, in row 2, 3, and 4 the outcome is the ratio of people owning stocks, bonds, and funds in percentage terms, respectively. In row 1 in Panel B, the outcome is the wealth per capita invested in Turkish Lira in any stock market asset in a province, in row 2, 3, and 4 the outcome is the wealth per capita invested in stocks, bonds, and funds, respectively. In row 1 in Panel C, the outcome is the share of wealth invested in stocks in percentage in a province, in row 2, and 3 the outcome is the share of wealth invested in bonds, and funds, respectively. In all regressions, we add province and year fixed effects. In column 2, regressions include region (12-NUTS1) specific linear time trends whereas in column 3 controls for region (12-NUTS1) specific year effects. In column 4, regressions also control for province trend interacted with the pre-refugee level (in year 2010) of concerning outcome variable. Column 4 presents the OLS estimates for the fourth 2SLS specification. The last column reports the sample average. F-stat reports the first stage F-stat for each specification. Standard errors are clustered at the province level. *** p < 0.01, ** p < 0.05, * p < 0.1.

provinces and years. Later, we estimate the refugee effects through our main specification in each simulated sample with the placebo distance instrument. Then, we test the null hypothesis that there is no reduced form refugee effect i.e., the Fisher null hypothesis. To conduct such a randomization inference exercise, we obtain the distribution of the estimated beta coefficients of the placebo distance instrument and report how many times our estimated coefficient of the true distance instrument falls into the distribution presenting the placebo distance instrument coefficients.

In Fig. 3, we plot the distribution of the estimated coefficients of the placebo distance instruments for the refugee ratio, which is also our first stage specification in our IV analysis. Our estimated coefficient with the true distance instrument never falls into the distribution of the coefficients arising from the placebo distance instrument, implying that the impact of the distance instrument on the refugee ratio is causal and not by chance. In line with this, in Fig. 4 we present the randomization inference exercise with placebo distance instruments for the financial outcomes precisely impacted by the refugees. Randomization inference exercise indicates that at conventional significance levels with almost zero p-values, we are able to reject the null hypothesis of no refugee

effect, allowing us to conclude our point estimates are causal and true effects of refugees. All in all, it is quite difficult to argue that our significant point estimates for the ratio of refugee population and financial outcomes are by chance or coincidental rather than the true causal refugee effects.

7. Concluding Remarks

In this study, we explore the causal impacts of immigrants on the financial behavior of natives in unique a setting, Türkiye, which experienced sudden large refugee inflows led by the Syrian Civil War. The corresponding sudden refugee inflows enables us to identify the causal effects which are isolated through the exogenous geographical proximity to Syrian source governorates. To quantify the impacts of the immigrants on the financial behavior of natives, we employ a novel administrative data set provided by Borsa Istanbul Group which covers the investment decisions of the native population across provinces at an annual basis during the period of 2006–2019. Altogether, our study is the first to document the causal relationship between immigrants and the financial decisions of natives.

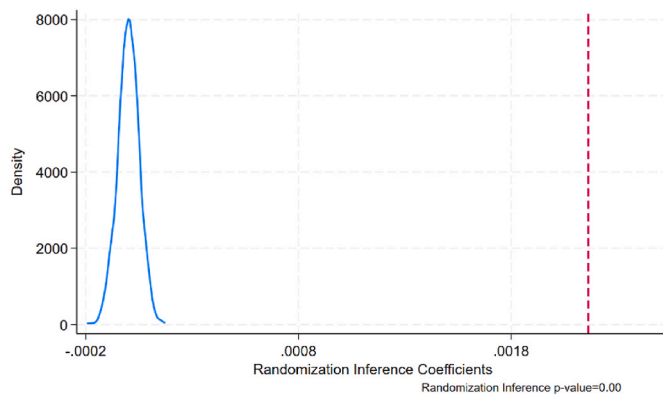


Fig. 3. Randomization inference exercises for the first stage – placebo distance instrument.

Notes: The figure presents the distribution function for the estimated coefficients for the randomization inference exercise. Particularly, we conduct 1000 simulations where we randomly assign the distance instrument and estimate our first stage specification, and subsequently plot the distribution function for the estimated coefficients. The dependent variable is the ratio of Syrian refugees. Regressions include province and year fixed effects, and controls for region (12-NUTS1) specific year effects. Observations are provinces. Moreover, the figure displays the estimated coefficient with the red dashed line for our sample and reports the randomization inference p-value on the bottom right of the figure.

Results show that immigrants have no overall significant effects on the financial decisions of natives. Our point estimates are all financial outcomes either small but precise or small and indistinguishable from zero. Particularly, we find no evidence that migrant stock significantly changes overall stock market participation at both extensive and intensive margins. Direct stock ownership or the wealth invested in stocks varies very small by the migrant stock. Neither economically nor statistically significant effects on the share of natives holding bonds or

funds appear. Moreover, no impact of migrants on the wealth per capita invested in bonds, funds, and the overall stock market emerges. Finally, we find limited evidence that the migrants improve the share of wealth invested in stocks but a decrease in the share of wealth invested in funds. So, our primary takeaway point is that the immigrants are not likely to drive the financial decisions of natives. We also shed light on whether the effects of immigrants heterogeneously vary by gender. Nevertheless, there is no significant variation by gender.

Prior research so far has explored the impacts of immigrants on natives in various domains of interest. Our study is the first documenting the causal impacts of immigrants on the financial decisions of natives in a unique setting that experienced sudden large refugee inflows induced by the Syrian Civil War. Even under a massive refugee inflow, our results suggest that migrant stock is unlikely to drive the financial decisions of native investors. Consistently, existing literature reports that labor market impacts of refugees are limited in Türkiye, and some international studies document that cultural consequences of immigrant stock appear to influence the financial behavior of natives. Yet, our findings imply neither of such channels is at play, so migrants are at best a minor factor driving the financial decisions of the native population.

Disclosure statement

The authors certifies that he has NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers’ bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

8. Ethics approval and consent to participate

Not applicable.

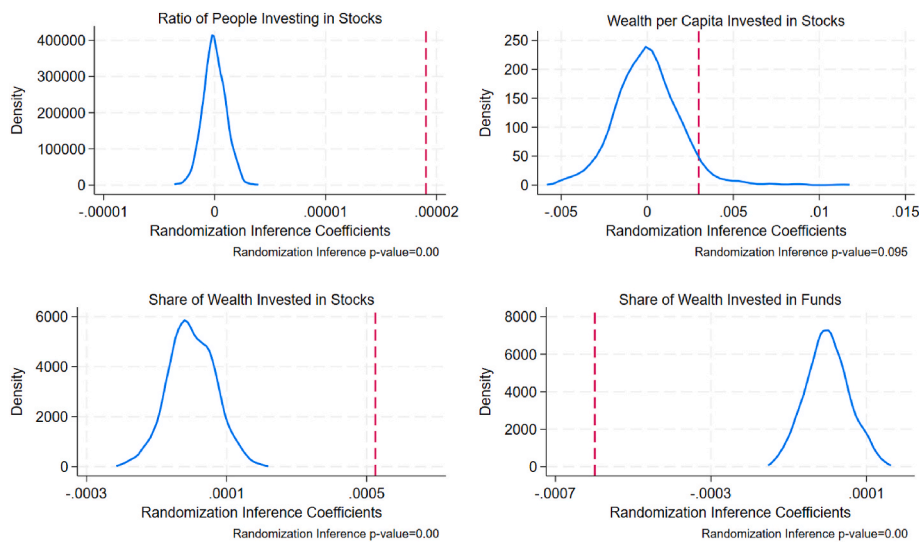


Fig. 4. Randomization inference exercises for financial outcomes – placebo distance instrument.

Notes: The figure presents the distribution function for the estimated coefficients for the randomization inference exercise. Particularly, we conduct 1000 simulations where we randomly assign the distance instrument and estimate reduced form specification, and subsequently plot the distribution function for the estimated coefficients. The dependent variable is the ratio of people investing in stocks, wealth per capita invested in stocks, the share of wealth invested in stocks, and funds in the panels indicated with titles. Regressions include province and year fixed effects, controls for the region (12-NUTS1) specific year effects, and controls for province trend interacted with the pre-refugee level (in the year 2010) of the concerning outcome variable. Observations are provinces. Moreover, the figures in each panel display the estimated coefficient with the red dashed line for our sample with the corresponding financial outcome and reports the randomization inference p-value on the bottom right of each figure.

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Consent for publication

The authors are willing to permit the Journal to publish the article.

Author contribution

The authors have contributed equally to this work. Both authors have read and agreed to the version of the manuscript.

Declaration of competing interest

The authors declare that they have no competing interests.

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