

EMPIRICAL ARTICLE

Foreign language mitigates home bias

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Abstract

This research examines the impact of investment language on Home Bias, investors' tendency to prefer local over foreign assets. Across 12 rounds of incentivized investment decisions with portfolio return feedback after each round, 398 participants deciding in a foreign language exhibited no home bias, whereas those deciding in their native language did. A moderated mediation analysis further indicates that using a foreign language reduces fluency cues linked to local assets, thereby attenuating home bias. These findings extend the literature on the foreign language effect and suggest that encouraging foreign language use in investment contexts may reduce home bias and facilitate global market risk sharing.

1. Introduction

Traditional financial theory advocates for international diversification in investment portfolios (see, among others, Adler and Dumas, 1983; Grubel, 1968; Solnik, 1974). In practice, however, investors frequently overinvest in domestic assets, a phenomenon known as 'home bias' (French and Poterba, 1991). Despite advances in global financial market access and international trade, home bias persists (Chan et al., 2009; Kiyamaz et al., 2016; Solnik and Zuo, 2012). Economic explanations for home bias include information asymmetry (Ahearne et al., 2004; Van Nieuwerburgh and Veldkamp, 2009), transaction costs (Tesar and Werner, 1995), and the desire to hedge domestic risks such as exchange rate volatility (Fidora et al., 2007) and inflation (Adler and Dumas, 1983).

Behavioral explanations further account for home bias (Lin and Viswanathan, 2015; Shapira and Venezia, 2001). Investors often display heightened familiarity with local assets (Huberman, 2001), optimism about domestic markets (Strong and Xu, 2003), and ambiguity aversion (Barberis, 2013). Other psychological factors include processing fluency (Riff and Yagil, 2016), patriotism (Morse and Shive, 2011), and a sense of perceived competence when investing in familiar contexts (Kilka and Weber, 2000). Personality traits and cultural dimensions, such as individualism, openness to experiences, uncertainty avoidance, masculinity, and national pride, also contribute (Anderson et al., 2011; Beugelsdijk and Frijns, 2010; Morse and Shive, 2011; Niszczoła, 2014).

Home bias carries significant economic costs by limiting efficient risk sharing and raising the cost of capital (Chan et al., 2009; Lau et al., 2010). For example, Levy (2017) estimates that between 1998

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and 2015, home bias cost France roughly €17 billion annually, underscoring the need for effective mitigation strategies.

The present research investigates whether making investment decisions in a foreign language can reduce home bias. The ‘foreign language effect’ (FLE), first shown by Keysar et al. (2012), refers to individuals’ tendency to engage in more deliberate and less emotionally driven decision-making in a foreign language. Prior studies show that foreign language use can attenuate cognitive biases such as loss aversion and framing effects (Keysar et al., 2012), the hot-hand fallacy (Gao et al., 2015), the blind-spot bias (Niszczoła et al., 2023), and ambiguity tolerance (Purpuri et al., 2023), and can promote more utilitarian choices in social dilemmas.¹ These effects have been attributed to increased psychological distance (Hayakawa and Keysar, 2018), reduced emotional responses, and a shift toward Type-2 (rational) processing (Keysar et al., 2012). We hypothesize that using a foreign language to make investment decisions will mitigate home bias by weakening the influence of psychological drivers such as perceived fluency cues with local assets.²

We tested this hypothesis in a pre-registered (AsPredicted #109654), incentivized online investment simulation with 398 Israeli participants (aged 25–65) holding undergraduate degrees in math-related fields.³ Participants’ native language was Hebrew, but we expected them to be proficient in reading and understanding English because they would have studied it formally throughout elementary school, high school, and university. We verified proficiency through a pre-task English comprehension test; only those who passed continued to the simulation.

The experiment employed a 2×2 between-subjects design, randomly assigning participants to one of two stock identities: local (Israeli) or foreign (Estonian), and to either their native language (Hebrew) or a non-native (foreign) language (English) condition. Stock information was identical across groups except for the name of the stock and its location.

Over a simulated 12-month period, participants made 12 allocation decisions between the stock and a risk-free asset yielding 1.5% annually. Following a practice round and presentation of initial data (including sector, 60 months of past returns, and risk-level indicators; see Appendix A), participants received monthly feedback on their earnings and portfolio value. Portfolios began at 220 NIS⁴ (20 NIS endowment + 200 NIS loan). Poor investment decisions could result in losing some of the endowment. Participants were informed beforehand that 20% (1 of 5 participants) would be randomly selected to receive their net profits (final portfolio value minus loan and 25% tax).

The data reveal a significant influence of investment language on investment decisions. Demonstrating home bias in the native language condition, participants invested 62.77% in the local stock compared to 56.68% in the foreign stock, a 10.74% ($\frac{62.77-56.68}{56.68}$) relative increase in local investment. In the non-native language condition, allocation to local (59.81%) and foreign stocks (58.74%) was similar, providing no support for home bias. These findings show that using a foreign language to make investment decisions mitigates home bias. In addition, to the best of our knowledge, we are the first to demonstrate the FLE in repeated, incentivized decisions.

A moderated mediation analysis was conducted to reveal the underlying mechanism driving the foreign language effect on home bias. Fluency cues were higher for the local stock than for the foreign stock. These cues were associated with greater investment only in the native-language condition. This pattern suggests that using a non-native language attenuates the impact of fluency cues, reducing reliance on incidental ease and fostering more analytic decision-making (e.g., Keysar et al., 2012).

¹See Costa et al. (2014a, 2014b), Geipel et al. (2015), Hennig and Hütter (2021), and Hayakawa and Keysar (2018) for demonstrations of the FLE in social dilemmas.

²While we focus on the moderating effect of the FLE, a direct main effect of foreign language on investment decisions is possible. The direction and magnitude of this effect, however, remain uncertain. Prior research offers mixed evidence, with some studies reporting that foreign language use increases risk-taking and investment (Circi et al., 2021; Hadjichristidis et al., 2015), while others suggest it may reduce familiarity with assets and thereby decrease investment (Grinblatt and Keloharju, 2001; Konara, 2020).

³We recruited participants with a basic mathematics background so they could comprehend both the incentive structure and the performance feedback.

⁴At the time of the experiment, 1 US dollar equaled about 3.7 NIS. 4

Our findings extend the literature on the foreign language effect by showing its persistence in repeated, incentivized financial decisions with performance feedback.⁵ Practically, they suggest that encouraging foreign language use in investment contexts may reduce home bias and promote global market risk sharing.

2. Hypotheses

The primary objective of our study is to investigate whether using a non-native language to make investment decisions mitigates home bias. A secondary objective is to examine whether the Foreign Language Effect persists over repeated decisions with feedback. Drawing on prior literature, we propose three hypotheses:

H.1 Home bias in the native language. Participants making investment decisions in their native language will invest more in a local stock (relative to a risk-free asset) than in a foreign stock (relative to a risk-free asset).

Non-native language use has been shown to reduce decision-making biases, including the framing effect (Keysar et al., 2012), the hot-hand fallacy (Gao et al., 2015), and the blind-spot bias (Bialek et al., 2022). We predict that using a foreign language will also attenuate home bias.

H.2 Foreign language attenuates home bias. The relative preference for the local stock (relative to a risk-free asset) observed in participants' native language (H1) will be weaker, or absent, when participants make investment decisions in a foreign language.

Home bias is a persistent phenomenon, suggesting multiple contributing economic and psychological mechanisms. Economic determinants include asymmetric information (Ahearne et al., 2004) and transaction costs (Tesar and Werner, 1995), among others. Psychological determinants include familiarity (Huberman, 2001) and fluency (Riff and Yagil, 2016), among others. Confidence may also play a role: although some evidence suggests that overconfidence promotes trading and international diversification (Graham et al., 2009), other work suggests it can increase perceived competence and optimism about local assets (Kilka and Weber, 2000), thereby reinforcing home bias.

Research on the foreign language effect shows that using a non-native language can promote more rational and analytical decision-making (Keysar et al. 2012), suggesting that foreign language use may weaken the impact of psychological factors on investment preferences. These considerations lead us to propose the following exploratory hypothesis.

H.3 (Ad hoc hypothesis): The moderating role of language on psychological factors. We explore whether fluency cues mediate the effect of stock location on investment in the native-language condition and whether this mediation path is severed when investors use a non-native language for investment decisions. Because we did not have an exact prediction, we did not preregister this hypothesis.

3. Experimental setup

3.1. Participants

Using the Midgam Project platform, an Israeli research survey company (e.g., Barokas et al., 2024), we recruited 451 Israeli individuals to participate in an online experiment. Eligibility criteria required that participants be native Hebrew speakers (i.e., not bilinguals) and hold a B.A. degree in a math-based field (e.g., economics, accounting, engineering). Before beginning the investment simulation experiment, all participants completed language comprehension tests in both English and Hebrew. We administered the English test to ensure participants' comprehension of the English (non-native language) investment simulation, while the Hebrew test was administered to establish symmetry between the two languages

⁵Response-incentivized studies of the FLE are scarce and with mixed results. The only study to use both repeated choice and incentives, but without feedback, is Bialek et al. (2022), who explored the FLE in intertemporal choice. They did not find that the FLE increases rational behavior. In fact, they found some evidence for the opposite.

and experimental procedures. Language test order differed by condition: participants in the native-language condition (Hebrew) took the English test first; those in the non-native (English) condition took the Hebrew test first, thereby minimizing language spillover from the last test taken into the main task. Forty-seven participants failed the English test, two failed the Hebrew test, and four did not complete the task, leaving 398 participants who completed the experiment ($M_{\text{age}} = 36.8$; $SD_{\text{age}} = 9.7$; 55.5% were males).

3.2. *Design*

The experiment employed a 2×2 between-participants design with two stock identities (local: Israeli; foreign: Estonian) and two language conditions (native Hebrew, non-native English). We chose Estonia as the foreign country based on a lexicographic criterion: we identified countries with the same credit rating according to Standard and Poor's and Moody's. At the end of 2023, Estonia was the only country matching Israel's ratings (Standard and Poor's: AA-; Moody's: A1). While this choice ensured comparable credit ratings, we acknowledge that differences in perceived familiarity could influence the degree of home bias observed. The Israeli stock was Elbit Systems Ltd, from the industrial sector. The Estonian stock was Hario Elekter A.S, also from the industrial sector. The study was pre-registered (AsPredicted #109654)⁶ and approved by the authors' institutional ethical committee (# IRA168).

3.3. *Procedure*

Participants were informed of the experiment's nature and told they could withdraw at any time. Those who consented were randomly assigned to one of the four experimental groups. All participants received the same instructions. The experiment had three parts: a short pre-task questionnaire, a 12-round investment simulation, and a short post-task questionnaire. The pre-task questionnaire and investment simulation were presented in the randomly assigned language (Hebrew or English); the post-task questionnaire was always presented in Hebrew.

3.4. *Investment simulation*

Participants were informed they would allocate 200 NIS between a risky asset (a stock) and a risk-free asset, simulating a 1-year investment cycle with monthly allocation decisions over 12 rounds. In addition to a guaranteed base pay of 20 (plus the research company's participation payment), participants received a 200 NIS loan for investment in the simulation. To maintain incentive compatibility, they were informed that one in five participants would be randomly selected to receive a payout based on their final portfolio value, minus the loan and a 25% tax on gains (the tax rate on capital gains in Israel).

In each round, participants allocated 100% of their current portfolio between the stock and the risk-free asset with a nominal transaction fee of 0.09% applied to each trade. They were informed that a higher allocation to the risky asset could increase returns but also risk losses. Numerical examples were provided to illustrate the calculation of after-tax earnings and the adjustment of these earnings against the base payment. The risk-free asset offered a certain annual return of 1.5%. The risky asset was either Elbit Systems Ltd. (local condition) or Hario Elekter A.S. (foreign condition).

Stock information included historical 60-month data: mean annual return, annual standard deviation, and maximum and minimum monthly returns, along with a graph of monthly returns (see Appendix A for the experiment instructions and questionnaires). The Elbit Systems Ltd. data were actual; for the Hario Elekter A.S. condition, the same historical data were presented to ensure comparability across conditions. This did not affect credibility, as none of the participants tracked the actual Hario Elekter A.S. stock. Specifically, we asked participants to rate the extent to which they keep track of the stock on a scale from 1 (not at all) to 7 (continuously); $M = 1.17$, with more than 95% choosing 1 and none choosing 4 or above.

⁶<https://aspredicted.org/dc8wv.pdf>.

Before the main task, participants completed a practice round (that did not affect their payoff) to familiarize themselves with the investment interface. Next, participants proceeded to the monthly investment rounds. It was reiterated that the total investment across both assets had to sum to 100% of available funds and that investing a negative percentage in one of them (i.e., loans and short selling) was not permitted. To ensure that the investment task would be as similar as possible across experimental conditions, we predetermined an identical, randomly determined order of returns for the 12 rounds.⁷ Returns in each round depended on the total value of their portfolio for that round and their allocation between the risky and riskless assets.

An attention check was embedded midway through the simulation. Participants who did not pass this check were excluded from the analysis of the questionnaire results in the robustness check. The result remains qualitatively the same.

After each of the 12 investments, participants saw their monthly return, gain or loss, and current portfolio value. At the end of the 12 rounds, they were shown their final accumulated amount. Several days later, one in five participants was paid according to the mechanism described above.

3.5. Pre-task questionnaire

This survey measured: (a) confidence, how well participants expected to perform in the investment simulation; (b) familiarity, to what extent they felt familiar with the relevant stock; (c) name fluency, how easy the stock name was to pronounce or read; (d) follow-stock, how closely they tracked the stock's performance; and (e) follow-local market, to what extent they follow the Israeli stock market. For our analysis, familiarity and name fluency were averaged to form a *fluency-cues* (Flue) composite indexing. All responses were on 7-point scales. Full item wording and scale anchors appear in Appendix A.

3.6. Post-task questionnaire

Administered in Hebrew, this survey collected demographic information (age and gender), and additional measures: stock market investment experience; self-rated English reading comprehension; patriotism, how proud they felt about Israel; and concern about the economic consequences of the proposed judicial overhaul in Israel at the time of data collection. Participants were thanked for their participation.

4. Results

A total of 398 participants completed the investment simulation ($M_{\text{age}} = 36.83$, $SD = 9.70$, 55.5% male).⁸ Of these, 44.2% reported having independently invested in the stock market. On a 7-point scale measuring how closely they follow the Israeli stock market (1 – Not at all, 7 – All the time), the mean rating was 2.75. More information on the experiment's variables appears in Table B4 of Appendix B. The key variables are: INVEST (percentage of portfolio allocated to the risky asset), LAN (investment language: 0 = native, 1 = non-native), LOC (stock location: 0 = foreign, 1 = local), FAM (perceived familiarity with the stock), AGE, and GENDER.⁹

Table 1 presents the mean investment rate over the 12 rounds for each of the four combinations of stock location (*LOC*) and investment language (*LAN*). Demonstrating home-bias, in the native-language condition, participants invested more in the local stock (65.21%) than in the foreign stock (55.23%).

⁷The randomly determined returns for the 12 months (including the practice round) were: 5.6%, -4.7%, 9.34%, -7%, 5.2%, 2.85%, 13.02%, -6.77%, -3.18%, 12.55%, -12.24%, -1.75%, 1.16%.

⁸Data can be found in the Supplementary material: <https://rb.gy/kztmb2>.

⁹The other measures (Fluency, Patriotism, etc.) did not affect home bias, so we do not report them.

Table 1. Risky asset investment.

	Native language	Non-native language	All
Local stock			
Mean	65.21	59.81	62.77
(SD)	(27.42)	(27.06)	(27.36)
<i>N</i>	108	89	197
Foreign stock			
Mean	55.23	58.74	56.68
(SD)	(29.39)	(27.42)	(28.35)
<i>N</i>	118	83	201
All			
Mean	60.00	59.29	
(SD)	(28.89)	(26.85)	
<i>N</i>	226	172	

Note: Average investment in the risky asset (stock) across the 12 rounds for each of the four groups. SD is the standard deviation; *N* is the number of observations.

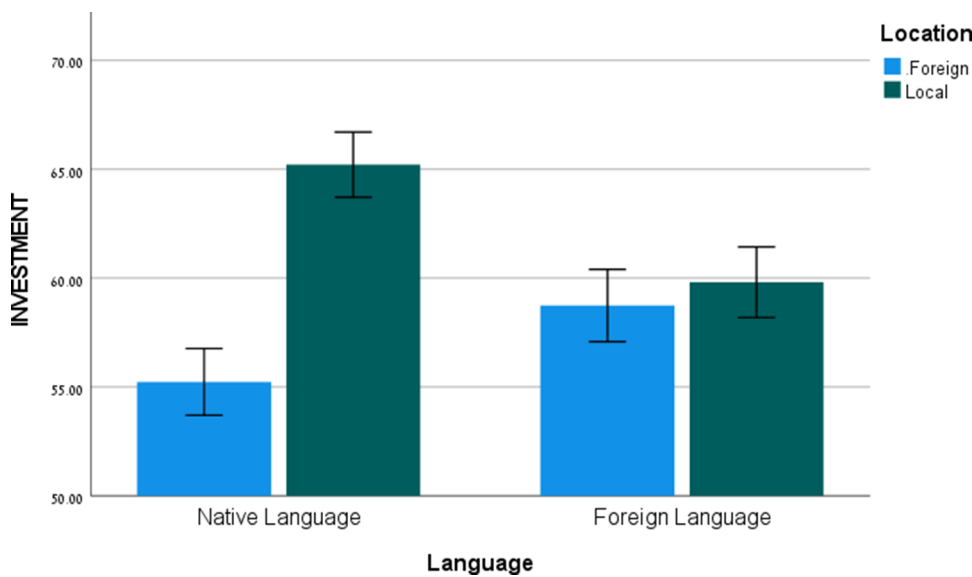


Figure 1. Mean risky asset investment. Error bars represent 95% confidence intervals. The figure visually illustrates the significant interaction between language and stock location ($p = 0.023$, one-tailed).

In contrast, this difference was negligible in the non-native condition (59.81% vs. 58.74%). This pattern is also shown in [Figure 1](#).

To formally test these patterns while accounting for the repeated measures structure, we estimated a linear mixed model with a random intercept for each participant and fixed effects of Time, Location, Language, and their interactions ([Table 2](#)).

The interaction term was negative and significant ($b = -8.91$, $SE = 4.46$, $p = .023$ one-sided), indicating that foreign language attenuates home-bias. Planned simple-effects analysis contrasting stock location within each language condition confirmed a robust home-bias in the native language ($b = 9.98$,

Table 2. Results from the linear mixed model¹⁰.

Random effect			
	Parameter	VAR	SD
Individual	C	458.283	21.413
	Residual	315.553	17.759
Fixed Effects			
	Estimate	SE	df
C	52.283*** (25.094)	2.083	449.036
Time (month)	0.454*** (6.092)	0.074	4379
Location	9.981*** (3.405)	2.931	402
Language	3.511 (1.113)	3.154	402
Location × Language	−8.911** (−1.999)	4.458	402

Note: Number of observations: 4776, cross-section 398, number of 12 periods. language = 0 for native and 1 for foreign), Location = 0 for foreign and 1 for local, Individual is the cross-sectional random effect. *t*-Statistics values are reported in parentheses. * 0.1, ** 0.05, *** 0.01 significant levels. *p*-value for interaction is one-tailed, as a directional hypothesis is specified. The dependent variable is investment in the risky asset. Units: INVEST is in percentages (0–100).

SE = 2.93, $p < .001$, Choen's $d = 0.562$) and no home-bias in the foreign language ($b = 1.07$, SE = 2.96, $p = .55$, Cohen's $d = 0.060$). Main effects of location (above language) and of language (above location) are of less interest and are reported in Table B1 in Appendix B.

Prior research on foreign-language processing and risk-taking has yielded mixed results, with some studies reporting small increases in risk tolerance (Costa et al., 2014; Keysar et al., 2012). In our study, foreign-language instructions produced a modest, non-significant increase in investment in foreign stock ($\Delta = 3.5$, SE = 3.15, $t = 1.11$, $p = .27$, $d \approx 0.13$). For the local stock, the corresponding contrast was slightly negative ($\Delta = -5.4$, SE = 3.55, $t = -1.52$, $p = .13$), suggesting that any direct, risk-enhancing influence of foreign language may be offset by its attenuation of home-bias. Importantly, this consideration lies outside our pre-registered goal, which was to examine whether foreign language use attenuates home bias.

We also examined how investment patterns evolved over the simulation period. Figure 2 shows the average stock investment level in each quarter for the four experimental groups, along with corresponding confidence intervals.

In the native language condition, the difference in stock investment between the local and foreign stocks was significant across all four quarters (results for quarters 1 to 4, respectively, are $z = 2.82$, $p < 0.01$; $z = 2.81$, $p < 0.01$; $z = 3.06$, $p < 0.01$; $z = 3.84$, $p < 0.01$). In contrast, in the non-native language condition, the local-foreign difference was not significant in any quarter (Results for quarters 1 to 4, respectively, are $z = 0.39$, $p = 0.39$; $z = 0.11$, $p = 0.45$; $z = 0.26$, $p = 0.40$; $z = 0.72$, $p = 0.23$). There

¹⁰Mixed-effects models were estimated using IBM SPSS Statistics (version 28.0.1.1) with restricted maximum likelihood (REML) estimation. The models included random intercepts for participants and fixed effects for all predictors. Degrees of freedom were calculated using the Satterthwaite approximation, and hypothesis tests for fixed effects were based on Type III sums of squares. Panel regressions were conducted in EViews (version 14), using random-effects models with generalized least squares (GLS) estimation and the Swamy and Arora estimator of component variances.

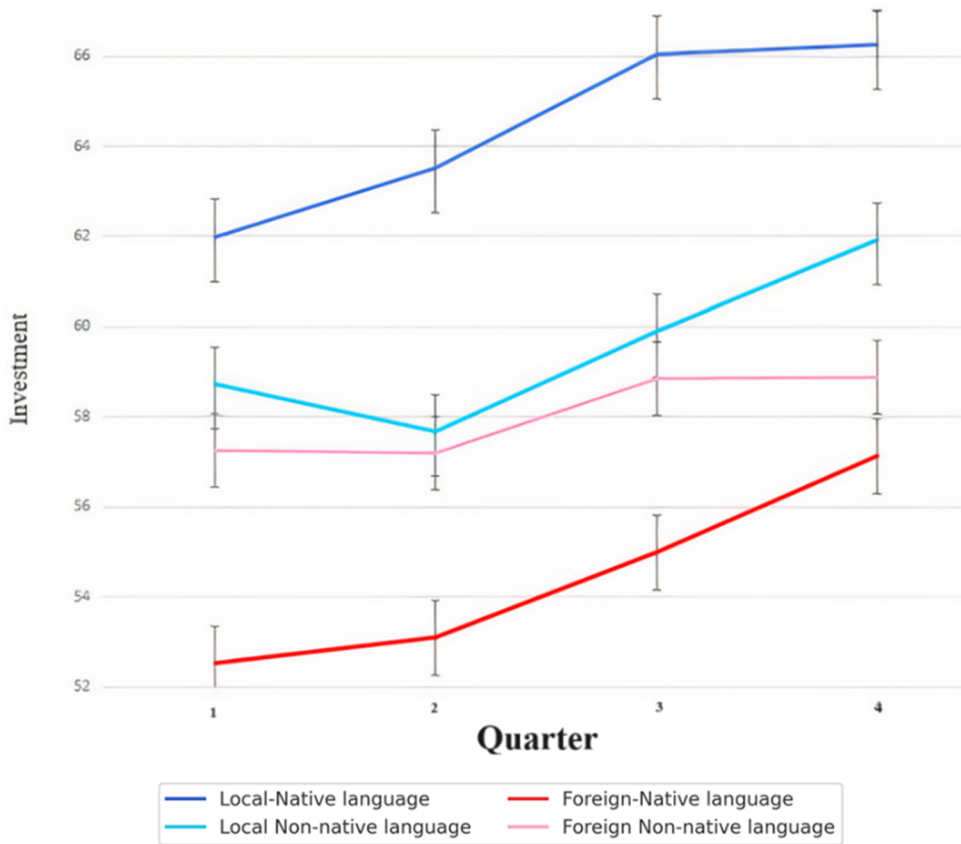


Figure 2. Level of investment over time. The average investment level in the risky asset for the four groups, for each quarter in the 1-year investment horizon portfolio. Vertical lines represent a 95% confidence interval.

was also a small but significant positive correlation between the investment period and investment in the risky asset ($r = 0.058$, $p < 0.01$), suggesting that participants learned over time that increasing risky asset investment could, on average, yield higher returns.

Next, we examine the effects of stock location (*LOC*) and investment language (*LAN*) and their interaction, while controlling for demographic variables (gender and age).

Equation (1) specifies the general mixed-effect panel regression, estimated over 12 rounds for 398 participants, predicting the percentage of investment in the stock as follows:

$$INVEST_{it} = \beta_0 + \beta_1 LAN_i + \beta_2 LOC_i + \beta_3 TIME_t + \beta_4 LAN_i LOC_i + \beta_5 lagINVEST_{it-1} + \beta_6 lagRET_{it-1} + U_i + \varepsilon_{it}, \quad (1)$$

where i and t in the index refer to participant i at time t , the dependent variable, $INVEST_{it}$, denotes the percentage of the portfolio invested in the stock, LAN_i is the language condition (0 is native and 1 non-native language), LOC_i is the stock location (0 is foreign stock and 1 is local stock), $TIME_t$ represents the time series (simulating the number of the month), $lagINVEST_{it-1}$ denotes the percentage invested in the stock in the previous round, $lagRET_{it-1}$ is the return of the stock in the previous round, U_i is the unobserved cross-sectional individual effect and ε_{it} is the random error term.

Table 3 presents the correlation coefficient matrix for all relevant variables. Table 4 presents the results from the random effect panel regression specified in equation (1). The regression includes Time

Table 3. Correlation matrix.

	INVEST	LAN	LOC	TIME	Lag_ INVEST	Lag_ RET	GEN	AGE
INVEST	1.000							
LAN	−0.012	1.000						
LOC	0.104***	0.039	1.000					
TIME	0.058***	0.000	0.000	1.000				
Lag_INVEST	0.624***	0.009	0.109***	0.035**	1.000			
Lag_RET	−0.0758**	0.000	−0.000	−0.139***	0.026*	1.000		
GEN	0.0578***	−0.041	0.001	0.000	0.055***	−0.000	1.000	
AGE	−0.076***	−0.127**	−0.051	−0.000	−0.069***	0.000	0.127***	1.000

Note: The table shows correlations between variables. INVEST is investment in the risky asset, LAN is language (0 is native and 1 non-native language), LOC is stock location (0 is foreign and 1 is local), TIME represents the round month, Lag_INVEST is the investment in the previous round in the risky asset, Lag_RET is the return of the stock in the previous round, GEN is gender (0 is female and 1 is male), AGE is measured in years, Number of observations: 4776, cross section 398, Number of 12 periods. * 0.1, ** 0.05, *** 0.01 significant levels.

Table 4. Multivariable regression analysis (dependent variable: investment in risky asset).

	<i>A</i>	<i>B</i>
<i>Intercept</i>	21.595*** (29.606)	23.272*** (15.979)
<i>LAN</i>	1.407* (1.816)	1.214 (1.570)
<i>LOC</i>	3.662*** (5.041)	3.554*** (4.926)
<i>LAN × LOC</i>	−3.608** (−3.286)	−3.631*** (−3.326)
<i>TIME</i>		0.215*** (2.499)
<i>Lag_INVEST</i>	(0.621) (63.599)	0.620*** (63.562)
<i>Lag_RET</i>	−32.31 (−9.677)	−30.828*** (−9.205)
<i>GEN</i>		1.668*** (3.045)
<i>AGE</i>		−0.107*** (−3.763)
<i>R</i> ²	0.395	0.402
<i>F</i> stat	570.658	366.115
Prob	<0.01	<0.01

Note: This table stipulates a panel multivariate with random effects. Number of observations: 4378, cross-section 398, Number of 11 periods (adjusted to lag variables). The dependent variable is investment. LAN is language (0 is native and 1 non-native language), LOC is the stock location (0 is foreign and 1 is local), TIME represents the round month, Lag_INVEST is the investment in the previous round in the risky asset, Lag_RET is the return of the stock in the previous round, and GEN is gender (0 is female and 1 is male). *t*-Statistics values are reported in parentheses. * 0.1 and **0.05, ***0.01 significant levels. Units: INVEST is in percentages (0–100); AGE in years (continuous); binary variables coded as described. The *F*-statistics are high due to the large number of observations and the consistent patterns in the panel data structure.

and the lagged investment and return terms to absorb the learning dynamics and serial dependence built into the 12-round task. We also estimate a specification including Age and Gender, where GEN_i is gender (coded as 0 for female and 1 for male) and AGE is measured in years, given their well-documented correlates with risk-taking.

As shown in Table 3, all variables significantly correlate with the level of stock investment ($INVEST$) in the anticipated direction, except for AGE and LAN.¹¹ Notably, TIME is positively correlated with $INVEST$, as we already discussed. Furthermore, we observe a positive correlation between lag $INVEST$ and $INVEST$, meaning that investment in a certain month is positively related to investment in the next month. We also observe a negative correlation between lag RET and $INVEST$, a finding we discuss below in more detail. Additionally, our findings indicate that females invest in the risky stock slightly less than males.

Table 4 shows the results of a random effects panel regression that provides confirming evidence for our hypotheses. Supporting H.1, the main effect of LOC is significant, indicating a home bias effect in the native language (panel A). Confirming H.2, the interaction of LOC with LAN is significant as well, showing that the home bias effect attenuates in the non-native language (panel A). Both these effects remain significant when adjusting for all the above-mentioned variables (panel B). In addition, TIME, lag $INVEST$, lag RET ,¹² remain significant, while GEN becomes non-significant. In addition, AGE is significant and in the expected direction, indicating that a higher age is associated with lower risk-taking.

The results indicate that participants tended to decrease their investment following positive returns and increase it following negative returns. Because the randomly assigned returns alternated between positive and negative in the first five rounds, this reactive strategy was effective during that period. However, the reactive investment pattern stopped toward the latter part of the study, when returns no longer alternated in this way. This response pattern, observed in both the native and non-native language conditions, suggests participants were sensitive to returns and did not adjust their investments randomly. Importantly, when considered alongside the investment patterns for foreign and local stocks, the findings indicate a persistent FLE that operates above and beyond any reactions to return information (see Appendix B, Table B2 for details).

4.1. Foreign language moderates the mediating effect of fluency cues

In this section, we present analyses aimed at exploring why HB attenuates when investing in a foreign language. Drawing on previous literature, we test whether investment decisions in a foreign language are less strongly influenced by subjective fluency cues, which objectively should not influence the decision to invest in the stock (Huberman, 2001; Riff and Yagil, 2016). Building on evidence that foreign language use promotes more rational decision-making (Keysar et al., 2012), we expected less reliance on these subjective feelings in the non-native language condition compared to the native language condition. To examine whether the effect of fluency cues (Flue) on investment depends on both language and stock location, we estimated three regression models. We tested whether Flue mediates the effect of location on investment, and whether this mediation is moderated by language, in three steps using cross-sectional random effects with the controls as shown in Table 5.

¹¹ Certain factors such as cultural similarities may diminish the FLE (Dylman and Champoux-Larsson, 2020). Also, findings regarding the relation between age and the willingness to invest in risky assets are mixed (e.g., Lichtenstein et al., 2019; Möbius et al., 2021). However, note that the correlation between both factors (LAN and AGE) with $INVEST$ are significant in our regression analysis, see Table 4.

¹² All participants received the same sequence of returns, primarily characterized by alternating positive and negative returns. Specifically, the randomly determined stock returns during the 12 months (including the practice round) were: 5.6%, -4.7%, 9.34%, -7%, 5.2%, 2.85%, 13.02%, -6.77%, -3.18%, 12.55%, -12.24%, -1.75%, 1.16%. This led to different gains and losses depending on the amount participants allocated to the stock option.

Table 5. Moderated mediation analysis.

	<i>A</i>	<i>B</i>	<i>C</i>
Intercept	3.425*** (43.578)	19.992*** (15.050)	17.122*** (11.900)
LAN			4.448** (2.447)
LOC	1.184*** (10.595)	3.495*** (4.349)	1.622*** (2.633)
Flue		3.013** (2.478)	0.951*** (3.116)
Flue × LAN			−1.191*** (−2.738)
TIME		0.315*** (2.581)	0.227*** (2.629)
Lag_INVEST		0.585*** (43.445)	0.620*** (63.763)
Lag_RET		−35.085*** (−7.378)	−31.076*** (−9.246)
R2	0.221	0.368	
<i>F</i> stat	112.26	289.400	408.497
Prob	<0.001	<0.001	<0.001

Note: Independent variable is Flue in Model A and investment in risky asset in Models B and C. Model A includes 398 observations, Model B 2486 observations, 11 periods, and 226 cross section (LAN = 0 only), Model C 4378 observations, 398 cross section, and 11 periods. Unstandardized coefficients are shown with robust standard errors in parentheses; * $p < .05$, ** $p < .01$, *** $p < .001$.

Step 1 (a-path): Location predicts higher Flue (Model A, $\beta = 1.18$, $p < 0.001$).

Step 2 (b and c paths): In the native-language subsample (LAN = 0), Flue positively predicts Investment, controlling for Location and covariates (Model B: $\beta = 3.01$, $p = 0.013$), while the direct effect of LOC remains positive ($\beta = 3.50$, $p < 0.001$).

Step 3 (moderation of the b-path): Adding Language and the Flue×LAN interaction (Table 5, Model C) shows that Language attenuates the Flue → Investment slope ($\beta_{\text{interaction}} = -1.19$, $p = 0.006$). In Model C, the main effects of LAN and LOC are positive ($\beta_{\text{LAN}} = 4.45$, $p = 0.014$; $\beta_{\text{LOC}} = 1.62$, $p = 0.009$).

To conclude, our analysis reveals that Flue strengthens the location–investment link in the native language, but this amplification attenuates under foreign-language processing. These findings align with prior evidence that the FLE can mitigate cognitive biases (Keysar et al., 2012; Niszczoła et al., 2023). While Keysar et al. (2012) link the effect partly to reduced loss aversion, this mechanism is unlikely to explain our results, because participants' base compensation was fixed regardless of potential losses in their loan or endowment.

4.2. Robustness checks

To allow for causal inference, we employed an experimental design with random assignment to conditions. Nevertheless, we conducted robustness checks to ensure that spurious variations among conditions did not influence differences in stock investment (INVEST).

First, we adjusted for English proficiency (*ENG*) and stock market experience (*EXP*), both of which can plausibly impact decision-making processes. *ENG* is particularly relevant for those participants who invested in their non-native language (English), while *EXP* may influence investment choices

more generally. For example, Graham et al. (2009) showed that more experienced investors perceive themselves as more competent, trade more frequently, and exhibit less home bias. Relatedly, Abreu et al. (2011) find that investors typically acquire domestic market experience before feeling confident enough to invest in foreign markets. Although we did not expect *ENG* to influence *INVEST*, given that all participants had passed an English comprehension assessment, we measured *ENG* via self-reported reading comprehension, and *EXP* via a yes/no item on whether participants had ever invested independently (see Appendix A, Part B, questions 3 and 4).

As shown in Regression A of Appendix B, Table B3, neither *EXP* nor *ENG* was significant, whereas both the main effect of *LOC* and the *LOC* $\times$ *LAN* interaction remained significant and in the predicted direction.

Next, we excluded participants who failed the attention check, read instructions too quickly, answered questions too quickly (per our preregistration), or consistently allocated either all or none of their funds to the stock. In total, this process removed 86 participants (21.6 % of the sample). The results for the remaining 312 participants are shown in Appendix B, Table B3, regression B. After excluding these participants, both the main effect of *LOC* and the *LOC* $\times$ *LAN* interaction remained significant and in the expected direction. The positive effect of foreign language on investment persisted in this restricted sample. Similar results were obtained when removing only those who failed the attention check, only those who responded too quickly, or only those who consistently invested 0% or 100% in the stock.

To account for the potential influence of the ongoing proposed judicial overhaul debate in Israel, we added a variable measuring concern about the reform's economic consequences (1 = not concerned at all, 7 = very concerned; see Appendix A, Part B). This analysis (Appendix B, Table B3, Regression C) revealed a significant negative interaction between concern and *LOC*, indicating that more concerned participants invested less in the local stock – consistent with expectations based on economists' warnings about the reform's potential economic impact. Nonetheless, both the main effect of *LOC* and the *LOC* $\times$ *LAN* interaction remained statistically significant and in the expected direction. In summary, the findings support H.1, revealing a home bias in the native language, and support H.2, showing it attenuates in a foreign language.

5. Concluding remarks

This research investigated whether investing in a foreign language mitigates the home bias effect. Using an incentive-compatible experiment, we orthogonally manipulated both the language of investment and stock location. In addition, we adjusted for potentially intervening factors, the most important being stock returns. Participants made 12 monthly investment decisions, each followed by feedback on portfolio performance, simulating a dynamic real-world investment environment. The design allows for causal inference regarding the effect of investment language on home bias while adjusting for potential confounds.

Consistent with past research (Coval and Moskowitz, 1999; Huberman, 2001), we observed a significant home bias effect among participants investing in their native language. In contrast, those investing in a foreign language, while deliberately reacting to return feedback, did not exhibit home bias.

Our research makes three main contributions. First, we contribute to the home bias literature by showing that home bias attenuates when investment decisions are made in a foreign language. Second, we contribute to the foreign language effect (FLE) literature, showing for the first time that the FLE persists over multiple rounds of decision-making in an incentivized environment with performance feedback. Despite the limited and primarily numerical information presented between rounds, the effect of foreign language use sustained over time, reducing reliance on non-diagnostic cues. This persistence underscores the potential of foreign language use as a practical tool for choice architects seeking to promote more analytical decision-making. Third, our moderated mediation analysis suggests that

investing in a foreign language can help reduce the influence of fluency cues. This, in turn, leads to a decrease in investments in local assets in a foreign language. Our findings align with the work of Keysar et al. (2012), showing how a foreign language attenuates cognitive biases.

Our research identifies a strategy to mitigate home bias. Home bias inflates the cost of local capital, reducing market efficiency and imposing significant costs on economies. Policymakers and investment platforms could leverage the present findings by encouraging or defaulting to foreign language interfaces for portfolio management. Given that over 65% of Europeans speak and read more than one language¹³ and that multilingualism may be even more common among investors, such an intervention could reduce familiarity-driven distortions in asset allocation, improve global diversification, and enhance market efficiency.

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¹³ According to European union statistics: rb.gy/2jg8ou.

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Appendix A. Investment experiment instructions and questionnaire

A1. Investment experiment

Dear Participant,

This two-part experiment investigates investment decisions. In the first part, you will make investment decisions. In the second part, you will answer related questions, and you will be asked to provide background information about yourself. Before you start the experiment, you will be asked to answer a few English and Hebrew-level questions. Your information will be kept anonymous and will be used for research purposes only.

A1.1. English level questions

The rise of social media has had a significant impact on the way people communicate and interact with one another. While social media platforms have brought people closer together and allowed them to connect with friends and family members from around the world, they have also raised concerns about privacy, security, and the spread of misinformation. As social media continues to evolve, it is important that individuals and organizations take steps to ensure that it is used in a responsible and ethical manner.

Questions:

1. What is one positive impact of social media mentioned in the paragraph?
 - A. It has raised concerns about privacy.
 - B. It has brought people closer together.
 - C. It has spread misinformation.
 - D. It has had no positive impact.
2. What is one negative impact of social media mentioned in the paragraph?
 - A. It has brought people closer together.
 - B. It has raised concerns about privacy.
 - C. It is used in a responsible and ethical manner.
 - D. It has had no negative impact.
3. Why is it important for individuals and organizations to take steps to ensure responsible and ethical use of social media?
 - A. To limit communication and interaction between people.
 - B. To protect privacy and security.
 - C. To spread misinformation.
 - D. To increase concerns about social media.

In this section, we also added 3 Hebrew Comprehension questions, while the Hebrew test was incorporated to establish symmetry between the two languages.

A1.2. Investment task instructions

In this task, you will allocate money (200 NIS) between a risky asset (stock) and a risk-free asset with a certain positive return. You will make 12 allocation decisions, simulating monthly investments over a 1-year portfolio period.

In addition to paying 20 NIS for participating in this study (in addition to the regular payment from the survey company), we are also giving you a loan of 200 NIS for investing in the investment game. One of every 5 participants who will win a randomly drawn lottery will receive a payment based on their payoffs in the investment game.

In each of the 12 allocation rounds, you can divide your money between the stock and risk-free asset however you want, but you must allocate all your money between the two assets. The purchase/selling fee is 0.09%.

As you increase the amount of the risky asset (stock) in your portfolio, the mean return will increase, but the risk will also increase, meaning you could lose money.

Your gains or losses will be the cumulative return of your portfolio over the 12 allocation decisions, less 25% tax on the gains. For example, if you have 300 after having made your 12 allocation decisions, your earnings will be $300 - 200$ (your loan) = 100, before tax. Your after-tax earnings will be 75 (the 100 in earnings minus 25%). The 75 NIS will be added to your base payment of 20 NIS, so you will receive a total of 95 NIS (=20 + 75). If, for example, after making your 12 allocation decisions, you have 190, your earnings will be $190 - 200$ (your loan) = -10 before tax. Because losses are not taxed, the loss of -10 will be subtracted from your basic payment of 20 NIS, and you will receive 10 NIS (=20-10).

A1.3. Part A

You can invest the money we loaned you in the following two assets for a holding period of 1 year: (stock name) stock from (name of country), and a risk-free asset that yields a certain annual return of 1.5%.

(stock name) from (name of country) is from the industrial sector.

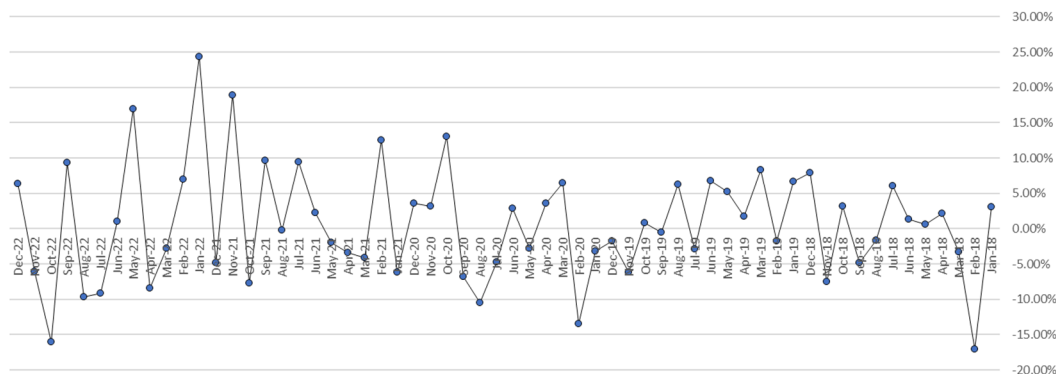
The data in the following table show the stock's mean annual return, annual standard deviation, maximum monthly return, and minimum monthly return.

The data are based on historical monthly data from the last 5 years.

Historical data of the stock from (name of country)

Mean annual return	8.54%
Annual standard deviation	27.98%
Maximum monthly return	24.31%
Minimum monthly return	-17.01%

The figure below shows the monthly change in returns of the stock between 2018 and 2022.



Analysts predict that [stock name]'s stock in the last 5 years is a very good indicator of its future returns in the next year. Therefore, we determined the stock's returns in the 1-year period for which you are making your allocation decisions, based on the distribution of its historical monthly returns over the past 5 years (those shown in the figure).

Before you start making investment decisions that will influence your actual payoff, you will make one investment whose results will not influence your payoff (a 'practice' round).

After your first real investment, you will continue to decide how much to invest in the risky asset versus the risk-free asset. At the end of each (monthly) investment round, we will present you with your portfolio's return for the last month and its cumulative return.

As mentioned above, the total percent invested (across the two assets) must be equal to 100%.

Before proceeding to the investment game, please answer the following question with the answer that best fits you. There are no correct or incorrect answers to these questions.

1. How do you anticipate you will perform in the investment game compared to other participants?
1 (Well below the average) to 7 (Well above the average)
2. To what extent do you feel familiar with the stock?
1 (Not at all) to 7 (very much)
3. To what extent is the name stock is easy or difficult for you to pronounce?
1 (Very difficult) to 7 (very easy)
4. Outside of this experiment, do you follow the performance of the stock in the stock market?
1 (Not at all) to 7 (all the time)
5. Do you follow the performance of the Israeli stock market?
1 (Not at all) to 7 (continuously)

A1.4. Part B¹⁴

1. Gender
2. Age
3. Do you invest or have you invested independently in the stock market?
(Yes) 2 (No)
4. Indicate your level of reading comprehension in English.
1 (Very Poor) to 7 (Excellent)
5. To what extent do you feel proud of Israel these days?
1 (Not at all) to 7 (Very much)
6. Are you concerned about the economic consequences of the legal reform?
1 (Not concerned at all) to 7 (Very concerned)

Appendix B

Table 1 indicates that the main effect of location was significant, whereas the main effect of language was not.

It is noteworthy that this pattern, characterized by a negligible or non-significant relationship in the initial and final periods, interspersed with a robust, significant relationship during the intermediate phase, was consistently observed across various categorical time divisions (e.g., when dividing the periods into three equal, four-month segments).

Table B1. *Results from linear mixed model (main effect only).*

Random effect			
	Parameter	VAR	SD
Individual	C	458.283	21.41
	Residual	315.55	17.76
Fixed effects			
	Estimate	SE	df
<i>C</i>	54.124*** (28.860)	1.875	460.053
<i>Time (month)</i>	0.454*** (56.092)	0.074	4379
<i>Location</i>	6.128*** (2.764)	2.238	401
<i>Language</i>	−0.947 (1.476)	2.217	401

Number of observations: 4,776, cross section 398, Number of 12 periods. *Language* = 0 for native and 1 for non-native), *Location* = 0 for foreign and 1 for local, and *Individual* is the cross-sectional random effect. *t*-Statistics values are reported in parentheses. * 0.1, ** 0.05, *** 0.01 significant levels. *p*-value for interaction is one-tailed, as a directional hypothesis is specified. The dependent variable is investment in a risky asset. Units: INVEST is in percentages (0–100).

Table B2. Return variable divided into three periods.

Variable	Coefficient—all sample	Coefficient—non-native versions
<i>C</i>	19.146*** (18.029)	17.810*** (12.263)
<i>LAN</i>	1.412* (1.830)	
<i>LOC</i>	3.675*** (5.081)	0.007 (0.011)
<i>LAN</i> × <i>LOC</i>	−3.620*** (−3.311)	
<i>Time</i>	0.436*** (3.825)	0.412*** (2.625)
<i>Lag_IVEST</i>	0.619*** (63.663)	0.669*** (48.195)
<i>TIME1</i> × <i>Lag_RET</i>	−5.968 (−0.510)	−16.526 (−1.027)
<i>TIME2</i> × <i>Lag_RET</i>	−5.047*** (−9.139)	−4.365*** (−6.096)
<i>TIME3</i> × <i>Lag_RET</i>	−0.067 (−0.082)	1.014 (0.897)
$R^2 = 0.395$		$R^2 = 0.445$
$F\text{-Stat} = 357.66$		$F\text{-Stat} = 251.62$
Prob. < 0.001		Prob. < 0.001

Note: This table stipulates a panel multivariate with random effects. *TIME* is divided into 3 periods, where *TIME1*, *TIME2*, and *TIME3* are months 1–2, 3–10, and 11–12, respectively. Number of observations: 4378, cross-section 398, Number of 11 periods (adjusted to lag variables). *t*-Statistics values are reported in parentheses. * 0.1, ** 0.05, *** 0.01 significant levels. The dependent variable is investment in the risky asset, measured in percentages (0–100). *LAN* is language (0 is native and 1 non-native language), *LOC* is the stock location (0 is foreign and 1 is local), *TIME* represents the round month, *Lag_IVEST* is the investment in the previous round in the risky asset, *Lag_RET* is the return of the stock in the previous round, The *F*-statistics are notably high due to the large number of observations and the consistent patterns in the panel data structure.

Table B3. Robustness regressions.

	<i>A</i>	<i>B</i>	<i>C</i>
<i>Intercept</i>	23.022*** (11.612)	29.814*** (15.695)	23.207*** (15.93)
<i>LAN</i>	1.217 (1.569)	1.781** (1.975)	1.219 (1.577)
<i>LOC</i>	3.556*** (4.926)	4.522*** (5.396)	5.759*** (4.902)
<i>LAN</i> × <i>LOC</i>	−3.625*** (−3.313)	−3.478*** (−2.743)	−3.831*** (−3.499)
<i>TIME</i>	0.215** (2.499)	0.258*** (2.583)	0.215** (2.504)
<i>Lag_INVEST</i>	0.620*** (63.545)	0.558*** (46.764)	0.619*** (63.355)
<i>Lag_RET</i>	−30.828*** (−9.205)	−37.792*** (−9.710)	−30.815*** (−9.201)
<i>GEN</i>	1.674*** (3.019)	1.034*** (1.638)	1.487*** (2.671)
<i>AGE</i>	−0.106*** (−3.736)	−0.139*** (−4.356)	−0.100*** (−3.353)
<i>English level</i>	0.041 (0.185)		
<i>Experience</i>	0.007 (0.0127)		
<i>Reform</i> × <i>Location</i>			−0.426** (−2.378)
<i>R</i> ²	0.402	0.341	0.403
<i>F</i> stat	292.76	219.86	326.06
Prob	< 0.001	< 0.001	< 0.001

Note: This table stipulates robustness regressions with random effects. Regression *A* results were obtained when adjusting for the level of English and Experience. Number of observations for regressions *A* and *C*: 4378, cross-section 398, Number of 11 periods (adjusted to lag variables). Regression *B* was obtained when removing outliers has 312 cross sections and 3744 observations. *Reform* is the attitude toward reform's economic consequences. The dependent variable is investment in the risky asset, measured in percentages (0–100). *LAN* is language (0 is native and 1 non-native language), *LOC* is the stock location (0 is foreign and 1 is local), *TIME* represents the round month, *Lag_INVEST* is the investment in the previous round in the risky asset, *Lag_RET* is the return of the stock in the previous round, *GEN* is gender (0 is female and 1 is male) and *AGE* in years (continuous). The *F*-statistics are notably high due to the large number of observations and the consistent patterns in the panel data structure. *t*-Statistics values are reported in parentheses. * 0.1, **0.05, ***0.01 significant levels.

Table B4. Descriptives.

	INVEST	AGE	GEN	FAM	EXP
Mean	59.69	36.83	0.55	2.84	0.44
Median	60.00	34.00	1.00	3.00	0.00
Max	100.00	63.00	1.00	7.00	1.00
Min	1.00	25.00	0.00	1.00	0.00
SD	28.03	9.70	0.50	1.49	0.50
Skew	−0.21	0.95	−0.22	0.598	0.25
Kurt	1.99	3.01	1.05	2.565	1.06
<i>N</i>	4,776	398	398	402,398	402,398

Note: Descriptive statistics of the variable in the experiment. INVEST denotes investment, EXP experience, FAM familiarity, GEN gender, *N* the number of observations, SD standard deviation, Skew skewness, and Kurt kurtosis. FAM refers to questions 2 and 3 in Part A of Appendix A, and EXP refers to question 3 in Part B of Appendix A. INVEST is measured as a percentage (0–100). FAM and EXP on a 1–7 Likert scale, AGE is in years, and GEND is a binary variable (0 = female, 1 = male).