Trading Stocks Builds Financial Confidence and Compresses the Gender Gap

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Abstract

Many studies document low rates of financial literacy and suboptimal levels of participation in financial markets. These issues are particularly acute among women. Does this reflect a self-reinforcing trap? If so, can a nudge to participate in financial markets generate knowledge, confidence, and further increase informed participation? We conduct a large field experiment that enables and incentivizes working-age men and women—a challenging group to reach with standard financial training programs—to trade stocks for four to seven weeks. We provide no additional educational content. We find that trading significantly improves financial confidence, as reflected in stock market participation, objective and subjective measures of financial knowledge, and risk tolerance. These effects are especially strong among women. Participants also become more self-reliant and consult others less when making financial decisions.

keywords: confidence, gender gap, financial literacy, stock-market participation, field experiment.

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1 Introduction

Despite an increasing awareness of the importance of well-informed financial participation, and a dramatic increase in access to financial trading, levels of understanding of financial concepts remain persistently low. Further, gender differences in confidence, that have been documented across many spheres, are particularly consequential in financial behavior: the financial world is often portrayed as a zero-sum competitive environment and stereotypically male.[1] These differences manifest themselves in several domains that are central to financial behavior. First, participation in financial markets is itself very uneven across genders.[2] Second, there are large and persistent gender gaps in performance on standard tests of basic financial understanding, partially reflecting differences in confidence.[3] Indeed, we find that even conditional on objective measures, women tend to have lower self-assessments of their financial knowledge than men. Finally, women are less willing than men to take risks, including in financial decisions.[4]

In this paper, we experimentally test whether participation in financial markets itself can lead to greater financial knowledge, better self-assessments, more risk tolerance, and ultimately higher and more informed participation, including among women. Such a reinforcing cycle might help explain the persistent gender gaps in financial knowledge,

[1] On gender differences in general, see Buser, Niederle and Oosterbeeck (2014), Sarsons and Xu (2015). These gaps translate into educational choices, entry into competitive (and potentially more renumerative) careers, and wage bargaining strategies, thereby reinforcing gender gaps in income, and shaping trajectories of economic development more generally. See Niederle and Vesterlund (2011), Duflo (2012), Flory, Leibbrandt and List (2015), Reuben, Sapienza and Zingales (2015), Reuben, Wiswall and Zafar (2017), Carlana (2019), Buser, Niederle and Oosterbeeck (2020), Roussille (2021). On the financial sector, see Barber and Odean (2001), Niederle and Vesterlund (2007, 2011), Huang and Kisgen (2013), Bordalo, Coffman, Gennaioli and Shleifer (2019).

[2] For example, van Rooij, Lusardi and Alessie (2011) find that 16.7% of women in the Netherlands owned stocks versus 30.3% of men. We find similarly large gaps in our baseline survey (see Table 2 below). Holding risk tolerance, education, age, and wealth constant, women are 4pp less likely than men to invest in stocks in Austria, 8.6pp in Italy, 7.1pp in the Netherlands, and 2pp in Spain (Barasinska and Schäfer, 2017).

[3] On the relation of confidence gaps to test performance see Bucher-Koenen, Alessie, Lusardi and van Rooij (2017) and Carlana (2019). On gender gaps in financial literacy more generally see, e.g., Bucher-Koenen et al. (2017), Hung, Yoong and Brown (2012). Lusardi and Mitchell (2014) provide a comprehensive review and discussion.

[4] Prince (1993), Powell and Ansic (1997), Eckel and Grossman (2008), Croson and Gneezy (2009), Falk et al. (2018).

confidence, and participation: women may be less confident and less knowledgeable about financial markets partly *because*, for historical reasons, they have been less likely to participate, and hence have had fewer opportunities to learn and update their perceptions about their skills. Indeed, a series of papers have found that women who do become financial professionals are not any less confident then men.[5] However, given the endogeneity of career choices, it has thus far proven difficult to disentangle learning from selection effects.

To shed light on these issues, we use an experimental approach. The idea is simple. While financial information is not hard to find, working-age adults often lack the time, immediate incentives, and opportunities to either learn by themselves or to participate in classroom instruction. There may also be psychological hurdles or other fixed costs associated with starting to trade in stocks (e.g. Merton, 1987, Guiso and Jappelli, 2005). We therefore design a field experiment where a representative sample of the working age population is randomly assigned opportunities to trade stocks. Using principles of persuasive design (Fogg, 2009) we enable, facilitate, and motivate individuals to participate in financial markets on a regular basis. This includes providing substantial incentives that provide a clear motivation to learn about and to trade in financial markets; a simplified stock trading platform that nevertheless allows individuals to track real-world financial assets; and regular triggers to follow one's portfolio and make investment decisions.[6]

Our population includes adult Israeli men and women who participate in a large nationally representative online panel. Our sample includes 1035 participants of prime working age (25 to 65), who are the main focus of this paper.[7] We randomly assign participants to either a control or a treatment group. Individuals in the treatment group

[5]Beckmann and Menkhoff (2008), Croson and Gneezy (2009), Blau and Kahn (2017).

[6]This is similar in spirit to Larcom, Rauch and Willems (2017) who show that forced experimentation with new routes on the London Underground led to lasting changes in behavior. Similarly Chen and Yang (2019) show that small prizes nudge people to discover the difference between domestic and foreign news with persistent effects.

[7]The appendix also reports results when extending the sample to include younger and older adult participants. The results are similar.

receive endowments of between $50 and $100 that they can use to trade in assets that track the value of specific indices or company stocks. The trading period lasts between four and seven weeks. At the end of the trading period, participants can receive the full value of their portfolios and some of them can choose to reinvest it for another month. Participants are encouraged to learn about the performance of their assigned asset and are incentivized to make weekly decisions to buy or sell part of their portfolio. However, we do not include any explicit financial education as part of our treatment: individuals are left to learn by themselves.

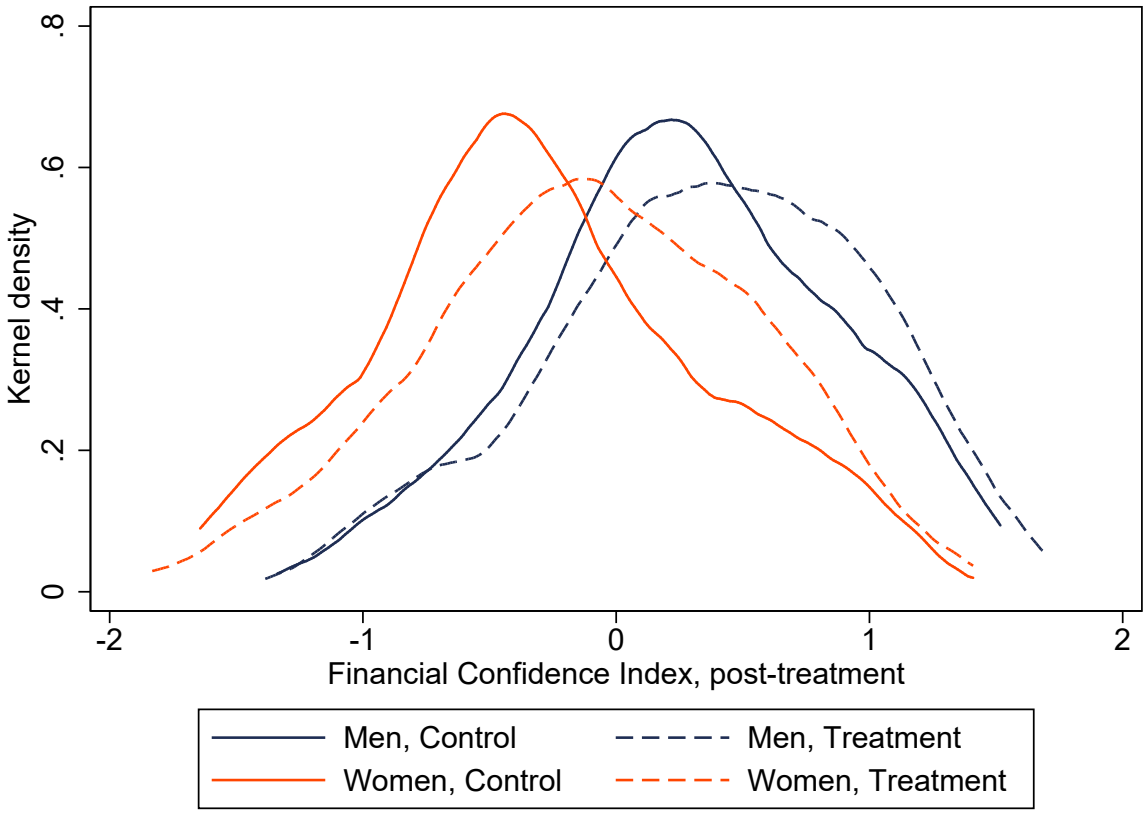
Participants also completed a separate series of surveys that anonymously polled their political behavior and attitudes. Among both men and women, support for peace negotiations increased as a result of the treatment, as did voting for parties supportive of the peace process (Jha and Shayo, 2019). This effect largely reflected a reevaluation of policies based on their impact on the national economy. In this paper we report the complementary results on financial confidence and knowledge.[8]

Building on the literature cited above (footnotes 1-4), we propose a Financial Confidence Index (FCI) that combines objectively measured knowledge and behavior with subjective self-assessments. This includes (1) individuals' performance on standard financial literacy quiz questions, (2) their self-assessments of their financial knowledge, (3) their willingness to take risks, and (4) their subsequent investment behavior. Following Kling, Liebman and Katz (2007), the FCI is a simple z-score index with equal weights on the four components, where higher values represent higher confidence. Beyond capturing the mutually-reinforcing nature of the four components, the use of a single index helps allay concerns about conducting multiple comparisons (Anderson, 2008).[9]

[8]The study was designed so that participants answered the political surveys separately from the financial surveys. As we demonstrate in the 2019 paper, they did not associate the political surveys with the financial study.

[9]The mutually-reinforcing links between risk tolerance, financial literacy and participation decisions has been noted most recently by Nieddu and Pandolfi (2020), who show that certainty equivalents of lotteries drop when they are framed as financial assets, but this effect is offset by enhanced financial literacy.

Figure 1: **Financial Confidence: Raw Treatment Effects by Gender**



Note: Kernel densities of the Financial Confidence Index. This index is a z-score index averaging over the post-treatment financial literacy score, self-assessed financial knowledge, propensity to invest after the experiment and willingness to take risks, each normalized to have zero mean and unit standard deviation (Kling et al., 2007).

Figure 1 shows the raw distributions of FCI by treatment assignment and gender. As seen in the control group (solid lines), our population replicates the gender gap in the various measures of confidence reported in the literature. Turning to the treatment group (dashed lines) notice that financial confidence increases for both men and women relative to the control. However, the treatment effect appears greater for women, and increases the overlap in confidence between men and women. Indeed, our econometric analysis suggests that the average treatment effect on FCI among treated women is highly significant and equivalent to about 40% of the FCI gender gap in the control.

Next, we look more closely at each of the different components of the FCI. We begin with financial literacy, an important outcome in its own right. Differences in financial

knowledge can reinforce gender inequality, as individuals with higher financial literacy can enjoy significant wealth gains over time.[10] And while women who become solely responsible for their financial outcomes, such as single women and widows, tend to attain higher financial literacy, gender gaps persist even for these groups (e.g. Fonseca, Mullen, Zamarro and Zissimopoulos, 2012, Hsu, 2015). Notably, *passive* investment, e.g. due to new default contributions in pension plans, can even lower financial literacy (Fisch, Lusardi and Hasler, 2019). However, developing effective and scalable financial education programs that can reach time-constrained adults remains a key challenge.[11]

We find that trading stocks via our intervention increases understanding of basic financial concepts and goes some way towards closing the gap between men and women. Compared to the control group, individuals assigned to trade in assets significantly improve their test scores on a battery of seven standard financial literacy questions. The treatment effect is close to 5 percentage points (or a 7.2% increase relative to the control) and highly statistically significant. This result complements the findings of Jha and Shayo (2019), that treated individuals become more likely to follow financial media, and have superior knowledge of stock performance. While both men and women benefit from the treatment, the effect on financial literacy is significantly higher for women (8pp, raising their financial literacy scores by 13.1% relative to the control) than for men (around 2.5pp, or a 3.7% increase). We further document that the effects on financial literacy

[10] Lusardi and Mitchell (2014), Lusardi, Michaud and Mitchell (2017). Furthermore, among those who participate in stock markets, individuals with higher financial literacy tend to make portfolio decisions that earn higher returns and are more diversified (Von Gaudecker, 2015, Bianchi, 2018). The more financially literate also appear to detect conflicts of interest by financial intermediaries and to make trades to mitigate the adverse effects of crises, such as the 2008 global financial crisis (Guiso and Viviano, 2015).

[11] A thriving literature examines the effects of financial education programs on financial literacy, financial outcomes, and economic behavior. Randomized control trials on financial education tend to yield positive but smaller effects than observational studies (see Entorf and Hou, 2018, Kaiser and Menkhoff, 2016, Lusardi and Mitchell, 2014, Hastings, Madrian and Skimmyhorn, 2013, for useful overviews). Some modes of financial education, such as "rule-of-thumb" education, appear particularly promising (e.g. Drexler, Fischer and Schoar, 2014, Carpena, Cole, Shapiro and Zia, 2015). Also related to our approach, Cole, Sampson and Zia (2011) find that small subsidies are more effective than financial education programs in spurring financial market involvement in emerging markets.

reflect both increases in objective financial knowledge and gains in confidence.[12]

The second component of our FCI is based on self-assessments. After the experiment, we asked participants to rate their financial knowledge on a scale from 1 (terrible) to 7 (excellent). Remarkably, women report lower self-assessed financial knowledge than do men at any given level of objective financial literacy. However, while the overall treatment effect is noisy, self-assessments tend to increase among treated women even as they tend to *decrease* among treated men. This is consistent with a possible tempering of male *over*-confidence.

Third, we find suggestive evidence that the treatment increases risk tolerance, especially among women, even while ruling out selection effects that have confounded previous studies.

The final component of the FCI is investment activity itself. Three months after the experiment we asked participants in both the treatment and the control groups whether they invested in stocks, bonds, mutual funds or other financial assets in the months after the experiment. Overall, the treatment increases the reported propensity to invest among the treated by about 19% relative to the control (7-8pp for both men and women). The point estimates imply a 21% increase in the propensity to invest for treated women relative to the control, and a corresponding 16% increase for treated men.

To directly observe willingness to invest, we also allowed a subset of the treated individuals to re-invest their portfolios in the Tel Aviv 25 index fund (TA25) via our platform for an additional month at the moment when they could redeem their portfolios at the end of the trading period. Pre-treatment, 47% of men in this group reported trading in stocks in the six months preceding the experiment. By contrast, only 26% of

[12]Specifically, we examine whether, when answering financial questions, individuals are willing to provide an explicit answer or choose to say they "do not know". At baseline, choosing "do not know" is about twice as prevalent among women than among men. These gender differences are consistent with patterns in answers to financial literacy tests in other contexts, noted by Lusardi and Mitchell (2014) and Bucher-Koenen et al. (2017). Post-treatment, however, we find that treated women reduce their propensity to answer that they do not know by 5.1 pp (or 32% relative to the control). Importantly, they are *not* more likely to provide wrong answers instead. The estimated effect on males' propensity to say they do not know is also negative but about a third in size and statistically insignificant.

women did. This gender gap narrows considerably after treatment. While 48% of these same men re-invest their earnings in the TA25, 41% of these women do so as well.

We next exploit different sub-treatments to shed further light on the mechanisms. These are exploratory and potentially underpowered. Nevertheless, the patterns are helpful for interpreting the results. First, treatments with higher stakes, or with higher exposure to stocks tend to have somewhat stronger effects on women's FCI. However, the lion's share of these effects are realized with relatively small stakes (about $50) and modest exposure to stocks. Interestingly, longer duration of exposure to stocks (seven rather than four weeks) does not have a systematically stronger effect. Indeed, there is suggestive evidence that among men, the longer exposure tends to temper initial gains in confidence. Second, we find that women tended to be more engaged and spent more time on our platform, which is consistent with their relatively large gains in financial literacy. Women also tended to be more accurate than men in their understanding of the week-by-week performance of their assets, which is consistent with their relative increase in self-confidence. Finally, following the experiment, both treated men and treated women are considerably less likely than the control to report consulting others in making financial decisions, and say they are more reliant on their own (online) research.

To the best of our knowledge, this is the first field experiment, and first study outside a school classroom setting, to randomly assign working-age adults incentives to trade financial assets and to study the effects on their financial knowledge and confidence.[13] On

[13]Previous studies among middle and high schoolers suggest that a learning-by-trading approach might be effective in improving financial literacy. In the large-scale Jump$tart Coalition study of American high school students, students who reported having previously participated in a stock market game exhibited higher financial literacy. In contrast, those who took a semester-long money management class without the game do not show any benefits (Mandell, 2008). Another stock market game implemented among students from fourth to tenth grade also showed promising results (Hinojosa et al., 2009). Among adults, analyses of investor behavior suggest that individual investors do become better over time (e.g. Nicolosi, Peng and Zhu, 2009). However, a large part of such improvements may be due to self-selection and attrition, as low-ability investors stop trading (Seru, Shumway and Stoffman, 2009). The implementation of a randomized control trial, where we also follow non-compliers, can help us shed new light on these issues as well. Closely related in terms of methodology, Bursztyn et al. (2014) assign a financial asset randomly among those who chose to purchase it through a brokerage firm, and study effects on take up by peers. Subsequent to our study, Margalit and Shayo (2020) examine how experimental assignment of stocks affects social and economic values in the UK. See also our companion paper (Jha and Shayo,

a methodological note, our study's design offers researchers a novel method of conducting experiments with an important set of financial factors that have previously proven very hard to randomize, certainly at scale. The fact that most of the effect sizes are achieved even with short periods of exposure and with a relatively small value of assets ($50) bodes well for scaling up the intervention cost-effectively in other settings as well.

The paper proceeds as follows. Section 2 and 3 describe the experimental design and the data. The main results are in Section 4. Section 5 explores the differential effects of several dimensions of treatment intensity, participant engagement, and patterns of seeking financial advice. We conclude in section 6.

2 Experimental Design

Participants were recruited from a pool of individuals who participate in a large Israeli internet panel. This panel of about 60,000 participants is nationally representative in terms of age and sex, and is commonly used for commercial market research, political polling, and academic studies. In parallel with this study, we also examined the effects of financial markets on political behavior. Therefore, we limited survey invitations to Jewish (majority) citizens who had voted in the past, and over-sampled secular centrist voters.[14] Individuals were invited to participate in a study on investor behavior. They were informed that after completing the baseline surveys they would be entered into a lottery to win either stocks or vouchers to invest in stocks, initially worth between NIS200 and NIS400 (about US$50 to US$100 at the time). Those who won would then receive weekly updates on the value of their portfolio and would then be able to buy and sell some of their assets.

2019).

[14]Specifically, we oversampled individuals who had previously voted for the secular centrist parties *Yesh Atid, Hatnu'ah* or *Kadimah* in 2013. See Jha and Shayo (2019). These voters are not significantly different from the rest of our sample in terms of gender and education, but have higher income on average; are more likely to report trading in stocks before the experiment; are more likely to reside in the Center (the region surrounding Tel Aviv, the country's financial center) and less likely to reside in Jerusalem; and are far less religious. Below we compare the resulting sample to the general population.

1418 individuals completed the two baseline surveys. We screened out those who provided incomplete answers, were grossly inconsistent when asked the same factual questions at different times, or had completed the survey extremely quickly. This left us with 1345 participants to randomly assign to the treatment groups. Overall, as shown in Appendix Table A1, the sample used for random assignment approximates the broader Jewish population of Israel in terms of geographical region and sex, but tends to be more educated and more secular, with fewer individuals under 25 and over 65 years. Given these demographics, the sample is thus slightly weighted *towards* individuals of prime working age. This economically crucial group is often hard-to-reach by standard financial education interventions, and is the central focus of this study.

Among these 1345 participants, we employed a block randomization procedure designed to increase balance across treatment groups.[15] The treatment group included 1036 participants and 309 were assigned to the control. Those assigned to the treatment group were invited to complete an instructions survey. In this survey they were informed of their asset allocation (Appendix Figure A1 shows a sample screenshot), given detailed explanations about the rules of the game, and quizzed to make sure they understood how the value of their assets would be determined. 840 participants completed the instructions survey and agreed to continue. Henceforth, we refer to these 840 as the "compliers".

Consistent with the notion that women are less confident about participating in financial markets, compliance was significantly lower among women. Despite the fact that all trades would be with money provided by the researchers—and that not participating meant losing this money—only 74% of women agreed to continue. By contrast, 87.5% of men agreed to continue. Anticipating the possibility of incomplete and selective takeup, we took special care to survey the outcomes of non-compliers so we can estimate both In-

[15]Specifically, we created 104 blocks of 13 (less for one block), with the blocks created to stratify on: 2013 vote choice, sex, a dummy for whether the individual traded stocks in the last 6 months, a dummy for whether the individual would recommend to a friend to invest in stocks from Arab countries, geographical region, discrepancies in their reported voting in the 2013 elections and a measure of their willingness to take risks. This creates relatively homogeneous blocks. Within each block we then randomize individuals into the subtreatments.

tent to Treat (ITT) effects and, importantly, the Treatment Effect on the Treated (TOT), using the random assignment to treatment as an instrument for actual treatment.

All participants were asked to complete a set of surveys, both before and after the experimental period, gauging their financial literacy, investment behavior and economic preferences, as well as social and political attitudes. In addition, those in the treatment group received a series of three to six weekly surveys in which to make their financial trading decisions.

The trading decisions and interface were designed to achieve two main goals. First, to encourage participation, active engagement and reinforcement learning even by individuals with no prior familiarity with financial markets. Second, we sought to expose individuals to real financial markets, using easily verifiable prices of publicly traded stocks. To this end, we kept the investment decisions extremely simple. Each individual in the treatment group traded in one asset only, with no commission on transactions. Every week, participants could reallocate no more than 10% of their holdings by buying or selling their assigned financial asset. This limit was chosen to encourage individuals to learn by doing rather than simply choosing their entire portfolios immediately. To further incentivize engagement with the stock market, participants who did not enter a decision lost the 10% that they could have traded that week. They could certainly decide to neither sell nor buy, but they had to enter a decision to avoid the loss.

The design incorporates three features that are believed to help make technology persuasive and foster behavioral change (see e.g. Fogg, 2009). (a) We provide a clear *motivation* to participate and take investment choices seriously, by giving participants a financial stake in the outcome of their decision. (b) We simplify the investment task so that even complete novices have the *ability* to perform it; and (c) we provide a weekly *trigger* to nudge participants to complete their next investment decision just as they receive feedback on their last week's performance, as well as when they are most likely to have time to do so.

Because this was the first study of its kind, the treatment included several variants to help document the mechanisms. Within the treatment group, participants were initially endowed with either: (a) vouchers they could use to invest in stocks, (b) domestic Israeli stocks, or (c) foreign stocks, almost all of which were from the neighbouring Palestinian Authority. The initial endowment could be either low in value (NIS 200 $\sim$ US$50 at the time), or high (NIS 400 $\sim$ US$100). Finally, some participants were randomized to hold assets for only four weeks (making three weekly investment decisions) before being divested and receiving the closing value of their portfolio. Others were assigned to holding stocks for seven weeks (making six investment decisions). Table 1 summarizes the basic design and initial allocation to treatments in the working age sample. Table A2 shows the assignment in the full sample.

Table 1: **Assignment to Treatments (25-65 Age Sample)**

	Total	Short Duration			Long Duration		
		All	NIS 200	NIS 400	All	NIS 200	NIS 400
Treatment	856						
Voucher to Invest	167	52	26	26	115	59	56
Domestic Stocks	343	118	59	59	225	111	114
Foreign Stocks	346	119	62	57	227	108	119
Control	256						

Individuals who were assigned stock endowments could sell (and later buy back) a specific stock or index fund. Of these, 343 were assigned a domestic asset. This was either the Tel Aviv 25 Index, stocks of a large commercial bank (Bank Leumi), or stocks of a telecoms company (Bezeq), randomly assigned. Another 346 participants were assigned a foreign asset from the Palestinian Authority: the Palestine Stock Exchange General Index, a commercial bank (the Bank of Palestine), and a telecoms company (PALTEL). Finally, the vast majority of the individuals assigned vouchers could buy (and later sell) an asset that tracked the Tel-Aviv 25 Index, but a few could trade in other indices.[16]

All assets were in fact a derivative claim on the authors' research funds rather than

[16]See Jha and Shayo 2019 for why we used this set of assets.

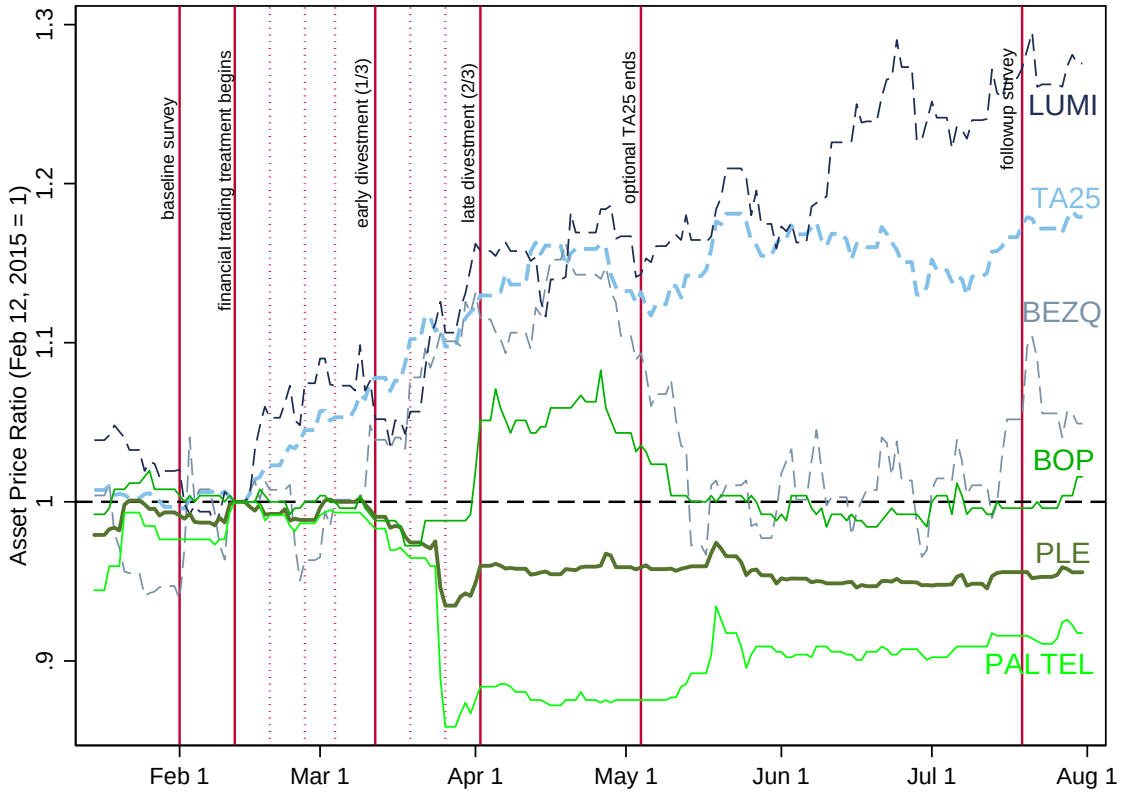
an actual purchase of the underlying asset. This also meant that the study could not affect the asset prices directly even for those that are thinly traded. Since some of the assets are listed in foreign currency (e.g. Jordanian Dinars), we fixed the exchange rate for the duration of the experiment so that there was no exchange rate risk for the foreign stocks. We also did not mention or allow for the possibility of short sales.

As shown in Table 1, about one half of the participants in the treatment group were given assets initially valued at NIS 400 (equivalent to around $100 at the time of the study), with the rest valued at NIS 200 (around $50). These sums are comparable to the average Israeli daily wage of around NIS 312 in December 2014. They are especially significant when compared to the standard pay of NIS 0.1 per question these participants receive for our and other surveys. Thus, they should be sufficiently large to generate considerable attention and engagement. As we shall see (Table 11), treatment effects do seem to be stronger for the high endowment, but the differences are mostly insignificant.

All the participants in the treatment group who completed the instructions survey (the compliers) received weekly updates about the price of their assigned asset and a statement of the composition and current value of their financial portfolio. This was sent out after markets closed on the last business day of the week (usually on Thursdays). We also provided links to the Hebrew version of *investing.com* to allow individuals to independently track and verify the historical performance and current price of their stocks. Participants were then asked to make their investment decisions and had until the opening of the stock market the following week to do so. All trades were implemented via a trading platform incorporated into our surveys (Figure A2 shows a sample screenshot of the trading screen).[17] 69% of the 840 compliers entered a trading decision at every opportunity and 80% did so in all but one week.

[17]Specifically, once the markets closed, we calculated for each individual: (1) the current number of stocks they own given previous trading decisions, (2) the value of these stocks given current prices and (3) the amount of cash at their disposal. We then informed them of their trading possibilities, namely how much they could buy (depending on the amount of cash at their disposal) and how much they could sell (depending on the amount of stocks owned). All trades were implemented at the current price, which was constant during the decision window as markets were closed.

Figure 2: **Timeline and Asset Prices during the Experiment**



Note: Vertical dotted lines indicate investment surveys. Individuals in the long duration group also traded on the week of the early divestment.

About a third of the treatment group were allowed to make three weekly trades. Overall, these participants were exposed to the stock market via our intervention from around February 12 to around March 12 (depending on the exact day on which they logged on). The remaining participants in the treatment group could continue to trade in their assets three more times before being able to cash their earnings on April 2nd. At that time, they were also offered the option of investing all or part of their money for an additional month in the TA 25 index fund (until May 4).

After completing the investment period, we fielded a post-treatment financial survey, including the financial literacy battery and a question on self-assessed financial knowledge. Finally, on July 19 we fielded a followup financial survey to all participants in the study (both control and treatment, regardless of compliance). Figure 2 summarizes the

timeline of the experiment, and shows the performance of the main participating stocks.

3 Data

Overall, 1,244 participants completed at least one of the post-treatment financial surveys. Of these, the bulk of our analysis focuses on those 1,025 adults of prime working age (between 25 to 65). As discussed in the introduction, this prime working age group is particularly of interest as it typically has less time, immediate incentives, and opportunities to learn about finance, and also tends to be particularly challenging to recruit for more standard classroom interventions. From an experimental design perspective, the working age group also has the added benefit of having stable life conditions relative to both young Israeli adults and to retirees. This made them easier to track over time. In the appendix we repeat the analysis using the full sample, including the below-25 and above-65 participants. The results turn out to be both qualitatively and quantitatively similar.

Table 2 reports descriptive statistics (Columns 1-2) from the baseline surveys, taken before assignment to treatments. These include whether participants traded stocks in the preceding six months, their performance in a financial literacy battery (detailed below), risk attitudes (on a 1-10 scale, from Dohmen et al. (2011)), demographics, and questions gauging trust and time preference (from the World Values Survey and Benjamin, Choi and Strickland (2010)). The table includes only the participants who completed at least one of the post-treatment financial surveys. About 54% of the sample are men, and the mean age is 40. More than half the men in our sample—and almost three quarters of women—report not having traded any stocks in the six months preceding the experiment. Women on average score lower on financial literacy at baseline, answering 65% of the financial literacy questions correctly, compared to 77% for men. Women were also about twice as likely as men to say they do not know the answer to financial literacy questions, and reported lower willingness to take risks. The sample is well distributed across education

Table 2: **Descriptive Statistics and Balancing Tests**

		Descriptive Statistics mean & [sd]		Difference Between Treatment and Control			
				Men		Women	
		Men	Women	Diff.	*p-value*	Diff.	*p-value*
		(1)	(2)	(3)	(4)	(5)	(6)
Bought/Sold Shares in Last 6 Mths [0/1]		0.443	0.277	-0.019	0.288	0.003	0.861
		[0.497]	[0.448]	(0.018)		(0.02)	
Financial Literacy Score [% Correct Overall]		77.272	64.881	1.626	0.427	1.781	0.445
		[21.27]	[22.94]	(2.045)		(2.327)	
Financial Literacy: % "Don't Knows"		5.689	11.875	-1.118	0.317	-1.433	0.462
		[10.874]	[18.081]	(1.116)		(1.947)	
Willing to Take Risks [1-10]		5.079	4.054	0.214	0.307	0.318	0.148
		[2.167]	[2.162]	(0.21)		(0.22)	
Age [Yrs]		40.205	40.452	-0.346	0.754	-2.344	0.041
		[10.83]	[11.163]	(1.101)		(1.144)	
Monthly Family Income [NIS]+		1.186	1.062	-0.047	0.409	-0.01	0.843
		[0.568]	[0.513]	(0.057)		(0.05)	
Post Secondary Education		0.241	0.217	0.058	0.188	-0.007	0.877
		[0.428]	[0.412]	(0.044)		(0.042)	
BA Student		0.123	0.11	0.002	0.958	-0.009	0.798
		[0.328]	[0.314]	(0.035)		(0.034)	
BA Graduate and Above		0.474	0.477	-0.032	0.52	0.045	0.375
		[0.5]	[0.5]	(0.05)		(0.051)	
Married		0.647	0.663	-0.02	0.684	-0.057	0.259
		[0.478]	[0.473]	(0.048)		(0.05)	
Religiosity:	Secular	0.659	0.642	0.034	0.375	-0.045	0.294
		[0.474]	[0.48]	(0.038)		(0.043)	
	Traditional	0.153	0.167	-0.048	0.191	0.026	0.528
		[0.36]	[0.373]	(0.036)		(0.041)	
	Religious	0.108	0.119	0.002	0.931	-0.007	0.814
		[0.311]	[0.324]	(0.027)		(0.029)	
	Ultra-Orthodox	0.079	0.073	0	0.509	0.026	0.117
		[0.27]	[0.26]	(0)		(0.017)	
Region:	Jerusalem	0.092	0.102	-0.024	0.434	-0.008	0.781
		[0.289]	[0.303]	(0.031)		(0.027)	
	North	0.079	0.119	-0.012	0.634	0.004	0.9
		[0.27]	[0.324]	(0.024)		(0.029)	
	Haifa	0.141	0.129	0.018	0.475	0.028	0.324
		[0.348]	[0.336]	(0.025)		(0.028)	
	Center	0.306	0.269	-0.049	0.204	0.033	0.393
		[0.461]	[0.444]	(0.038)		(0.038)	
	Tel Aviv	0.205	0.208	0.023	0.521	-0.038	0.298
		[0.404]	[0.407]	(0.036)		(0.036)	
	South	0.101	0.11	0.043	0.097	-0.02	0.492
		[0.301]	[0.314]	(0.026)		(0.029)	
	West Bank	0.076	0.063	0.001	0.97	0.001	0.958
		[0.265]	[0.242]	(0.026)		(0.023)	
Most People Can Be Trusted [0/1]		0.254	0.294	-0.018	0.678	0.01	0.839
		[0.436]	[0.456]	(0.044)		(0.048)	
Patience [time preference median or above]		0.636	0.665	0.001	0.979	0.039	0.453
		[0.482]	[0.473]	(0.05)		(0.051)	
Observations		555	480	555		480	

Notes: All variables measured pre-treatment. Columns 1-2 present descriptive statistics (means, with standard deviations in brackets). Columns 3-6 show the difference between the treament and the control groups. Each entry in Columns 3,5 is derived from a separate OLS regression where the dependent variable is the pre-treatment variable and the explanatory variable is an indicator for treatment group, controlling for the randomization strata. Robust standard errors are in parentheses and the p-values for the differences in cols 3 and 5 are in Columns 4 and 6, respectively. The table includes only participants who completed at least one of the post-treatment financial surveys.

+ In 10,000s NIS, computed as mid-point of SES income categories.

and religiosity levels, although, as mentioned above, it is somewhat more secular and more educated than the general population (Table A1). The geographical distribution mimics the general population.

Columns 3-6 in Table 2 report tests for systematic differences in these pre-treatment variables between the treatment and control groups, controlling for randomization strata fixed effects. Overall, the treatment group does not differ systematically from the control for men or women.

For our outcome measures we use data from the post-treatment financial survey whenever available. For those individuals who did not complete the post-treatment financial survey, we use the responses from the July followup survey (and include a dummy for July-response in the regression).[18]

Our main outcome variable is the Financial Confidence Index (FCI), which combines four components measured post-treatment: financial literacy, self-assessed financial knowledge, willingness to take risks, and propensity to invest in stocks after the experiment. The index is a simple average over these components, after normalizing each such that the control has zero mean and unit variance, following Kling et al. (2007). Figure 1 above reports the raw distribution of this index. We now provide details on its components.

(1) Financial literacy. Both the baseline and post-treatment surveys included seven financial literacy questions adapted to the Israeli context from van Rooij et al. (2011).[19] In the July followup survey we added an eighth question on the relative riskiness of

[18]Note that some questions were only asked in the July survey, most importantly the questions on investment activity in the months following the experiment (Tables 10, 11 below). Using only the July survey responses to construct the confidence index yields a somewhat smaller but still strongly significant treatment effect on the treated of 0.100 [0.032], with a coefficient of 0.047 [0.042] for the interaction on men and 0.167 [0.053] for women (compared to 0.15 [0.035] in Table 4, Column 3, and 0.083 [0.045] for men and 0.232 [0.061] for women in Column 5). A test of equality of these coefficients is rejected with p=0.089.

[19]To forestall potential attrition due to survey fatigue, we did not include all 16 literacy questions that van Rooij et al. (2011) used. In particular, we omit the following questions: on the time value of money, the main role of the stock market, the meaning of bonds, the response of bond prices to interest rates, and a comparison of fluctuations between bonds and stocks.

Table 3: **Financial Literacy Questions and Performance**

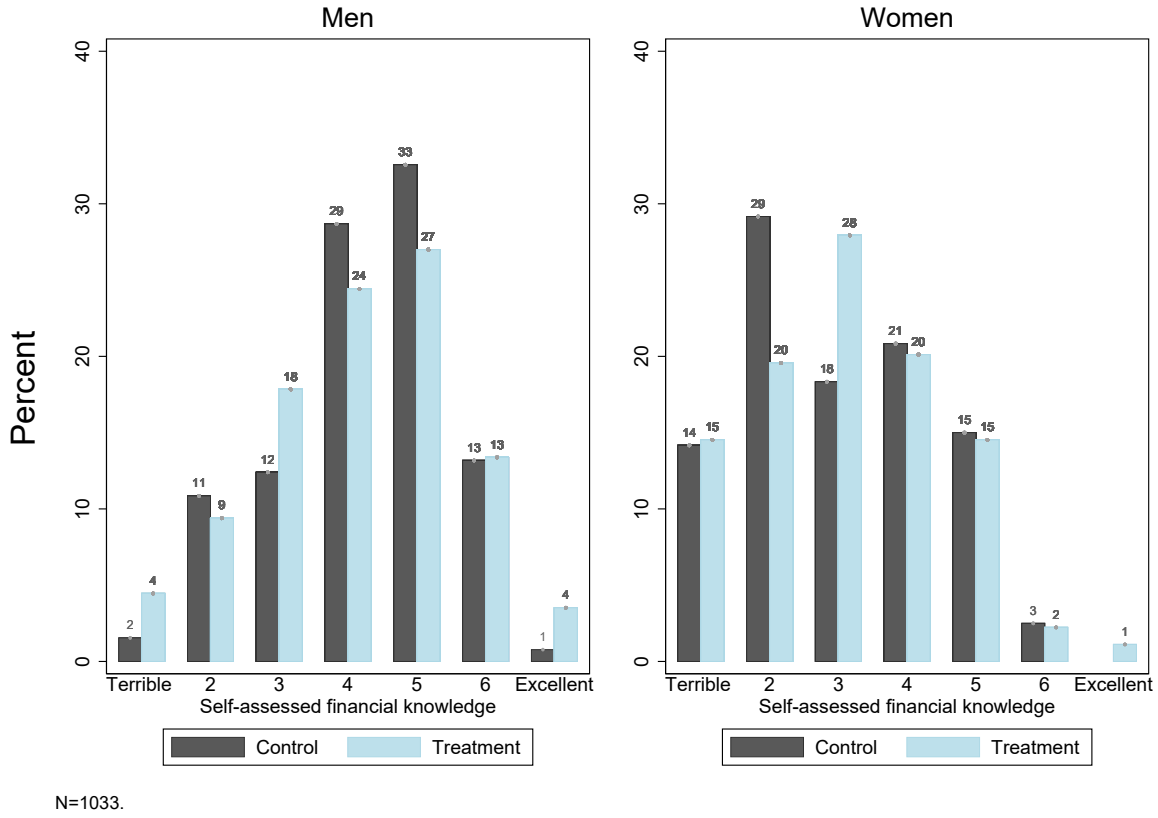
	Men		Women	
% Correct	**Control**	**Treatment**	**Control**	**Treatment**
Financial Literacy Score [% Correct Overall]	**75.2**	**78.8**	**60.7**	**67.3**
Numeracy: Suppose you had NIS 100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money in the account for the entire period? (i) > NIS 102; (ii) = NIS 102; (iii) < NIS 102; (iv) DK.	86.8	93.2	80.0	83.6
Compounding: Suppose you had NIS 100 in a savings account and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have in this account in total? (i) >NIS 200; (ii) = NIS 200; (iii) < NIS 200; (iv) DK	72.9	79.3	55.8	65.6
Inflation: Imagine an average household in Israel that has a savings account with an interest rate equal to 1% per year. Suppose the inflation is 2% per year. After 1 year, how much would the household be able to buy with the money in this account? (i) > today; (ii) = today; (iii) < today; (iv) DK	86.1	83.1	65.8	67.2
Money Illusion: Suppose that in the year 2020, your income has doubled compared to today and prices of all goods have also doubled. In 2020, how much will you be able to buy with your income? (i) > today; (ii) =; (iii) < today; (iv) DK; .	72.1	78.4	67.5	77.5
Stock Meaning: Which of the following statements is correct? If somebody buys the stock of firm X in the stock market: (i) He owns a part of firm X; (ii) He has lent money to firm X; (iii) He is liable for firm X's debts; (iv) None of the above; (v) DK.	72.1	74.4	49.2	65.6
Highest Return: Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return? (i) Savings accounts; (ii) Bonds; (iii) Stocks; (iv) DK.	54.3	57.3	31.7	35.0
Diversification: When an investor spreads his investments among more assets, does the risk of losing money: (i) go up; (ii) go down; (iii) =; (iv) DK.	82.2	85.9	75.0	76.4
Observations	129	426	120	360
Risk: Stock vs Fund: True or False: Buying a single company's stock usually provides a safer return than a stock mutual fund. (i) T, (ii) F, (iii) DK	52.7	65.8	31.7	41.7
Observations	112	389	104	324

Note: These questions are adapted to the Israeli context from van Rooij et al. 2011. For each uestion the table reports the proportion of men and women who answered them correctly after the experiment. Data include all participants who responded to at least one of the post-treatment financial surveys. The "Risk: Stock vs Fund" question was only asked in the July survey. The financial literacy score is the percent correct out of all the baseline seven items.

individual stocks versus mutual funds. The questions are detailed in Table 3, which also reports the proportion of men and women who answered them correctly after the experiment. The levels in the control are comparable to those reported by van Rooij et al. (2011) and Lusardi and Mitchell (2014) in other contexts.[20] Our main measure of

[20]van Rooij et al. (2011) report the following percentages of Dutch participants answering these questions correctly: Numeracy (90.8), Compounding (76.2), Inflation (82.6), Money Illusion (71.8), Stock meaning (67), Highest Return (47.2), Diversification (63.3) and Risk: Stock vs Fund (48.2). Lusardi and Mitchell (2014) report that for the basic 'Big Three' questions which test numeracy, compound interest and the relative riskiness of stocks versus funds, in the US, 38.3% of men vs 22.5% of women could answer all three questions correctly. This compares to 59.6% of men and 47.5% of women in Germany, 55.1% and 35.0% in the Netherlands and 62.0% and 39.3% in Switzerland respectively. In Israel too (the setting for our study), women are less financially literate, and tend to be less likely to search for financial information on their own (Meir, Mugerman and Sade, 2016).

Figure 3: **On a scale of 1 to 7, how would you rate your financial knowledge?**



N=1033.

financial literacy is the percent of questions answered correctly (top row). Notice that men in the control get 75.2% of the questions correct compared to 60.7% for women. Foreshadowing some of our results, the treatment group scores are higher on average for both men (78.8%) and women (67.3%), but the difference seems larger among women. Such raw differences should of course be treated with caution, as they do not control for the randomization strata and pre-treatment levels, and do not take into account differences in compliance.

(2) Self-assessed financial knowledge. Following the experiment, we asked participants to rate their financial knowledge on a scale from 1 (terrible) to 7 (excellent). The distributions are shown in Figure 3. Focusing first on the control group, men clearly have higher self assessments. While 14% of women say their financial knowledge is terrible, only about 2% of men do. These patterns are mirrored on the other extreme: around

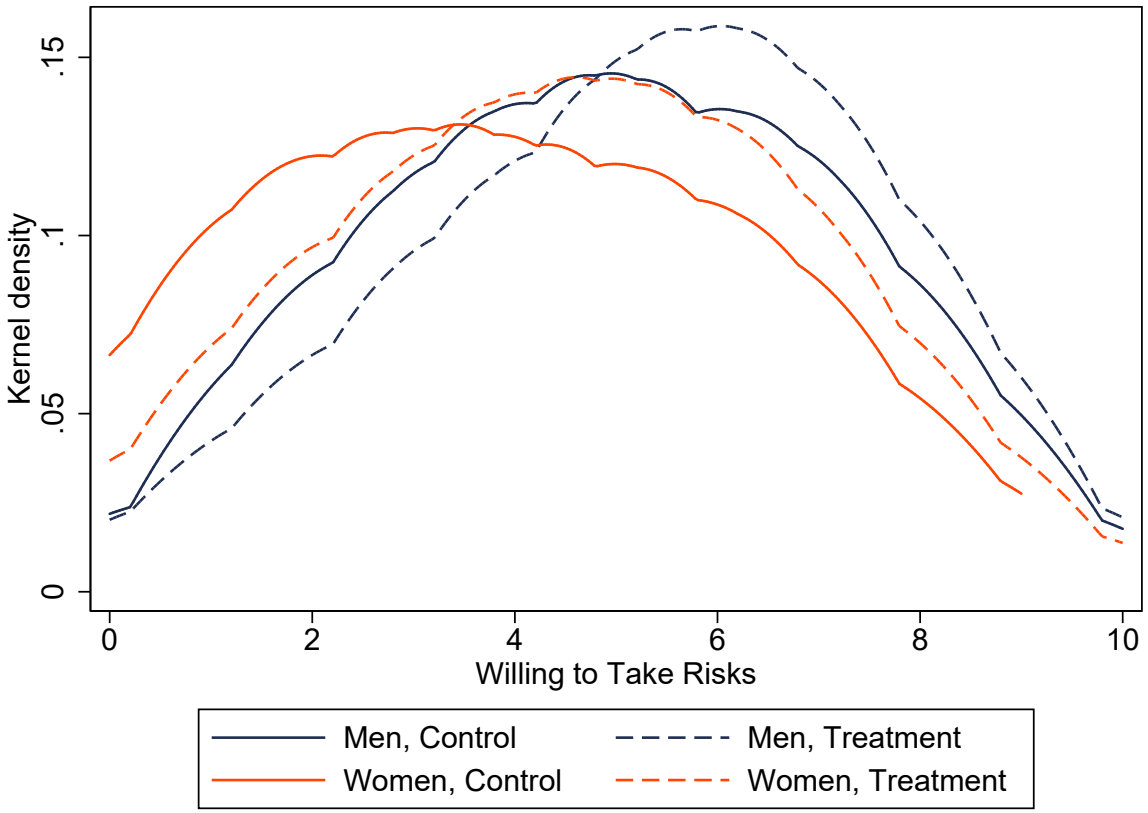
3% of women rate their financial knowledge at the highest levels of 6 or 7, whereas about 14% of men do. No woman in the control rates her financial knowledge as excellent. A Mann-Whitney test strongly rejects equality of these distributions.

Comparing the treatment and the control groups suggests a more nuanced picture. Despite the increases in actual financial knowledge noted above, both men and women in the treatment are more likely than the control to rate their own financial knowledge as just below the mid-point (3 on the scale). However, for women this appears to reflect a reduction in those believing they had very bad financial knowledge (2 on the scale), while for men, the treatment results in smaller shares than the control reporting that they had the midpoint financial knowledge (4) or just above it (5). Again, these raw patterns should be treated with caution. We report treatment effects in the next section.

(3) Risk preferences. We use a canonical question on risk tolerance, validated by Dohmen et al. (2011) both in the field and in incentivized experiments. The wording of the question is: "How do you see yourself? Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" answered on a scale of 1 (not at all willing to take risks) to 10 (very willing). The distribution of responses is shown in Figure 4 (using kernel density for ease). The data replicate women's lower risk tolerance reported in the literature (e.g. Falk et al., 2018) and again seem to suggest a reduction in the proportion of women with very low willingness to take risks following the treatment.

(4) Investment behavior. In the July followup financial survey, we asked: "In the past couple of months (that is, since May 2015), have you invested in stocks, bonds, mutual funds or other financial assets (not including any possible investments made by your pension or provident fund)?". Our measure of investment behavior is a simple indicator for a positive response. As we detail below (Section 4.4), we also collect a second, directly observed measure of investment behavior. This is based upon the choice we gave individuals whether to reinvest their earnings at the end of the experiment. Naturally this measure could only be collected from compliers in the treatment group,

Figure 4: **Willingness to Take Risks**



and hence cannot be included in the index. The raw data are reported in Table 9 below (last row).

Finally, Appendix Figure A3 presents histograms of responses to an open-ended question: "What did you learn from the study?" This question was fielded to the treated individuals at the end of the intervention, after they were divested of their portfolio. The modal response—expressed by close to 20% of both treated men and women—was that they became more familiar with the stock market.[21]

[21] 10% of both genders also expressed a positive view of the assets that they were assigned. There are some interesting gender differences as well. Women were about twice as likely as men to report that the stock market had become more accessible, as well as being slightly more likely to express greater confidence in the market as a result of the study. However, about 9% of treated women also responded that the study made them aware that they did not understand the stock market as well, compared to about 3% of men. On the other side, treated men were also about twice as likely as women to mention an increased awareness of market risks and of risk-return tradeoffs.

4 Results

Table 4 presents our main result. The dependent variable is the Financial Confidence Index. Column 1 reports the raw mean difference in FCI between those assigned to the treatment and to the control (Intent To Treat), without including any controls. Being assigned incentives to trade in financial assets raises individuals' FCI by 0.15 which is 22% of the standard deviation in the control. Column 2 further controls for past experience investing in stocks, gender, a quadratic in age, education, marital status, income, religiosity, region, pre-treatment measures of willingness to take risks and patience, pre-treatment financial literacy, and 104 fixed effects for the randomization strata. While the explanatory power of the regression increases substantially (from R^2=0.009 to R^2=0.582), the estimated treatment effect remains stable.

Column 3 estimates the Treatment Effect on the Treated (TOT), using assignment to treatment as an instrument for compliance. Given partial takeup, the estimated treatment effect is slightly stronger, at 0.15. These treatment effects, averaged across both sexes, are large and comparable in size to the 0.229 difference in FCI between men and women controlling for education, initial financial literacy and risk attitudes, and other demographics (Col 3).

Columns 4-5 break the treatment effect by sex. While, as we have seen, the effect is highly significant in the population as whole, the effect is especially strong for women: the estimated treatment effect on treated women is 0.23 compared to 0.08 for men (Col 5, p-value of difference: 0.058). Estimating treatment effects separately for the male and female samples, thus allowing the controls to vary by gender, yields similar effect sizes (0.09 for men and 0.21 for women, Cols 6-7).

The controls in Columns 2-7 are also informative. Not surprisingly, otherwise similar individuals that had actively traded in the stock market in the six months before the study have significantly higher FCI. Similarly, pre-treatment willingness to take risks is also correlated with higher FCI. Interestingly, FCI is significantly correlated with family

Table 4: **Treatment Effects: Financial Confidence Index**

	Full Sample					Males	Females
	ITT	ITT	TOT	ITT	TOT	TOT	TOT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment	0.152***	0.142***	0.150***			0.094**	0.214***
	(0.049)	(0.036)	(0.035)			(0.043)	(0.058)
Treatment x Male				0.084*	0.083*		
				(0.044)	(0.045)		
Treatment x Female				0.208***	0.232***		
				(0.057)	(0.061)		
Male		0.234***	0.229***	0.322***	0.317***		
		(0.078)	(0.073)	(0.091)	(0.085)		
Bought/Sold Shares in Last 6 Mths [0/1]		0.407***	0.401***	0.404***	0.398***	0.315***	0.645***
		(0.064)	(0.060)	(0.064)	(0.060)	(0.112)	(0.140)
Age [Yrs]		-0.008	-0.008	-0.008	-0.008	-0.013	-0.005
		(0.013)	(0.012)	(0.013)	(0.012)	(0.016)	(0.018)
Age [Yrs] Squared		0.000	0.000	0.000	0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Post Secondary Education		0.031	0.029	0.031	0.028	-0.035	0.133*
		(0.054)	(0.050)	(0.053)	(0.050)	(0.068)	(0.076)
BA Student		0.020	0.019	0.021	0.019	0.053	-0.041
		(0.064)	(0.060)	(0.064)	(0.061)	(0.083)	(0.092)
BA Graduate and Above		0.015	0.018	0.014	0.016	0.072	-0.016
		(0.049)	(0.046)	(0.049)	(0.046)	(0.066)	(0.065)
Married		0.042	0.041	0.044	0.043	-0.010	0.118**
		(0.037)	(0.035)	(0.037)	(0.035)	(0.049)	(0.053)
Family Income [10,000s NIS]		0.053	0.049	0.051	0.047	0.074*	0.002
		(0.034)	(0.032)	(0.034)	(0.032)	(0.042)	(0.051)
Traditional		0.050	0.053	0.045	0.049	-0.095*	0.170**
		(0.048)	(0.045)	(0.049)	(0.046)	(0.055)	(0.071)
Religious		-0.069	-0.070	-0.071	-0.072	-0.086	-0.090
		(0.070)	(0.065)	(0.069)	(0.065)	(0.090)	(0.093)
Ultra-Orthodox		-0.039	-0.044	-0.044	-0.046	0.033	-0.082
		(0.095)	(0.090)	(0.094)	(0.089)	(0.100)	(0.177)
Tel Aviv		0.047	0.050	0.053	0.055	0.008	0.067
		(0.054)	(0.051)	(0.054)	(0.051)	(0.065)	(0.088)
Willing to Take Risks [1-10]		0.089***	0.089***	0.089***	0.088***	0.070***	0.115***
		(0.007)	(0.007)	(0.007)	(0.007)	(0.009)	(0.011)
Time preference above median		-0.000	-0.000	-0.001	0.002	0.031	-0.008
		(0.034)	(0.032)	(0.034)	(0.032)	(0.041)	(0.051)
Pre-Treat Financial Literacy Score FEs	No	Yes	Yes	Yes	Yes	Yes	Yes
p-value (Treatment [x Male= x Female])				0.0856	0.0577		
Mean Dependent Variable (Control Group)	0.00	0.00	0.00	0.00	0.00	0.269	-0.291
SD	0.679	0.679	0.679	0.679	0.679	0.598	0.643
R-squared	0.009	0.582	0.579	0.583	0.384	0.358	0.374
Observations	1,037	1,037	1,037	1,037	1,037	555	482

Notes: This table shows the Intent to Treat (ITT: OLS, Cols 1, 2,4) and Treatment Effect On the Treated (TOT: 2SLS, Cols 3, 5-7) estimates of financial asset exposure on a Z-Score Index containing the following four post-treatment elements: financial literacy score, self-assessed financial knowledge, willingness to take risks and an indicator for financial investment (measured in July). Apart from the latter, these were measured in the March- April post-treatment surveys, supplemented by their July equivalents for missing respondents. We also show the treatment effect interacted with gender (Col 4-5), and separately by gender sub-sample (Cols 6 and 7) . All the demographic and other controls were measured pre-treatment. In addition to the controls above, Cols 2-7 also include 104 strata fixed effects, 4 religiosity categories, and 6 location categories (the excluded category is the Center District), and a dummy variable for respondents appearing in the July survey.The p-value in cols 4-5 is from a test of equality between the coefficients on Treatment x Male and Treatment x Female. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

income among men (Col 6), but not among women (Col 7). This pattern—where relatively affluent women are not much more financially confident than other women—also appears consistent with our hypothesized perception-participation-confidence trap.[22]

The rest of this section explores these patterns in detail, closely examining the different components of the FCI.

4.1 Financial Literacy

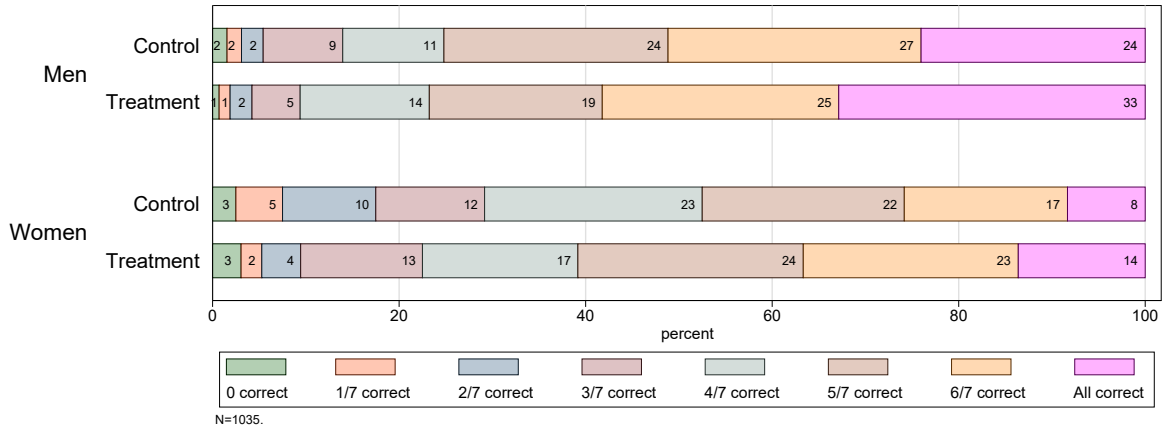
Figure 5 depicts the raw distributions of post-treatment performance in the financial literacy test, by treatment and gender. Specifically, it shows the distribution of the number of questions answered correctly, out of the seven questions listed in Table 3. Looking at the control group, the distribution for men is strikingly more skewed to the right compared to that of women (a Mann-Whitney test strongly rejects equality of the distribution, with $p < 0.001$). The gender gap is still apparent and highly significant in the treatment group. However, the difference between treatment and control among women is striking (and significant at $p = 0.008$). 37% of women in the treatment group answer more than six questions correctly, compared to less than 26% in the control. Among men, the numbers are 58% in the treatment and 51% in the control (with equality of distributions rejected at $p = 0.084$).[23]

Table 5 estimates treatment effects on financial literacy—measured by the percent of questions answered correctly—controlling for the full set of covariates from Table 4. The Treatment Effect on the Treated (TOT, col 1) on average across men and women is 4.9 percentage points (p-value=0.0003), relative to an average score of 68.22% among the control. As Column 2 reveals, the effect on treated women is 8pp, compared to 2.3pp for men (p-value of equality: 0.06). Estimating treatment effects separately for the male

[22]It is interesting to note, in contrast, that in the Israeli context, religion and marriage have the opposite pattern: while religiously traditional men are less financially confident than secular men, their female counterparts are more so. Similarly, married women are more confident than other women.

[23]Mann-Whitney tests do not reject equality of the pre-treatment distributions (for the same sample), either for women ($p = 0.286$) or for men ($p = 0.259$).

Figure 5: **Financial Literacy by Gender and Treatment**



and female samples (cols 5-6) yields similar effect sizes.[24]

4.1.1 Literacy Scores: Learning and Confidence

The treatment effect we find on financial literacy test scores could reflect both acquisition of new knowledge and gains in one's confidence in existing knowledge. To unpack this, we look more closely at how men and women respond to the literacy questions. Specifically, the extent to which respondents choose to answer that they "don't know" (DK) the answer to a question, rather than risking getting a question wrong (Bucher-Koenen et al., 2017). At baseline women are twice more likely than men to say they do not know the answer to a question (11.9% compared to 5.7%, Table 2, Cols 1-2, third item from the top). Table 6, Columns 1-4, estimate the treatment effect on the percent of "do not know" answers, controlling for pre-treatment percent of DK responses, as well as the full battery of controls from Table 5. Overall, the TOT estimate shows a 2.9 point reduction in the percent of DK's in the treatment relative to the control (Col 1). As Column 2 shows, this reflects a negative (statistically insignificant) 1.2pp effect among men and a negative 5pp effect among women. The difference is statistically significant at 8%.

[24]In terms of effect sizes, the uncontrolled *Hedge's g* measure for the ITT is 0.22 on the percentage of financial literacy questions answered correctly (0.27 for women and 0.17 for men). These effect sizes are comparable to those gleaned from experiments randomizing the assignment of financial education classes (see e.g., Kaiser and Menkhoff 2016).

Table 5: **Treatment Effects: Financial Literacy**

	All		Males	Females
	TOT	TOT	TOT	TOT
	(1)	(2)	(3)	(4)
Treatment	4.887***		2.809*	7.930***
	(1.342)		(1.599)	(2.246)
Treatment x Male		2.327		
		(1.643)		
Treatment x Female		7.966***		
		(2.369)		
Male	3.951	7.294**		
	(2.848)	(3.363)		
p-value (χ^2: Treatment [x Male= x Female])		0.0600		
Mean Dependent Variable (Control Group)	68.22	68.22	75.19	60.71
SD	24.63	24.63	22.48	24.73
R-squared	0.533	0.432	0.522	0.364
Observations	1,035	1,035	555	480

Notes: This table shows the Treatment Effect On the Treated (TOT: 2SLS) estimates of financial asset exposure on the % of 7 financial literacy questions answered correctly in our March- April post-treatment surveys, supplemented by their July equivalents for missing respondents. We also show the TOT interacted by gender (Col 2), and by gender sub-sample (Cols 3 and 4) . All regressions include the full set of controls from Table 4, Col 2.The p-values are from a $\chi 2$ test of equality between the coefficients on Treatment x Male and Treatment x Female. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

Looking within male and female subsamples (Column 3-4) again yields similar results. Taken together, this seems to suggest that trading in financial assets makes participants—and especially female participants—more willing to venture an answer. This can be taken as an indication of higher confidence in one's financial knowledge.

It is possible, that while treated individuals are more willing to provide an answer, they are actually providing wrong answers. Columns 5-8 in Table 6 estimate the treatment effect on the percent of literacy questions for which a flat-out wrong answer was given (i.e. neither correct nor DK). We find no evidence of an increase in wrong answers: if anything, the point estimates are negative.

Taken together, Tables 5 and 6 suggest that, especially among women, trading stocks improves the standard measure of financial literacy partly via increased willingness to

Table 6: **Treatment Effects: "Don't Know" and Incorrect Responses**

	% "Don't Knows"				% Wrong (Neither Correct nor DK)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	All	All	Males	Females	All	All	Males	Females
Treatment	-2.943***		-1.528	-5.087***	-1.718		-1.184	-2.471
	(0.983)		(1.075)	(1.594)	(1.169)		(1.464)	(1.918)
Treatment x Male		-1.204				-0.864		
		(1.176)				(1.481)		
Treatment x Female		-5.036***				-2.745		
		(1.755)				(2.002)		
Male	-6.079***	-8.349***			1.800	0.686		
	(1.797)	(2.305)			(2.290)	(2.768)		
Mean Dependent Variable (Control Group)	10.79	10.79	6.202	15.71	21.00	21.00	18.60	23.57
SD	19.03	19.03	14.71	21.79	18.72	18.72	17.18	20.00
p-value (χ^2:Treatment [x Male= x Female])		0.0805				0.466		
Observations	1,034	1,034	555	479	1,034	1,034	555	479
R-squared	0.401	0.401	0.291	0.482	0.302	0.302	0.391	0.236

Notes: Dependent variable are: the percent of financial literacy questions answered "don't know" (Cols 1-4); and the percent answered neither correctly nor "don't know" (Cols 5-8) . All outcomes are measured in Mar - April 2015, supplemented by their July equivalents for missing respondents. This table shows the treatment effect on the treated (TOT) (Cols 1,5), interacted by gender (Cols 2,6), and by gender sub-sample (Cols 3-4, 7-8). All regressions include the full set of controls from Table 4, as well as the pre-treatment dependent variable. The p-values in columns 2 and 6 are from a $\chi 2$ test of equality between the coefficients on (Treatment x Male) and (Treatment x Female). Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1.

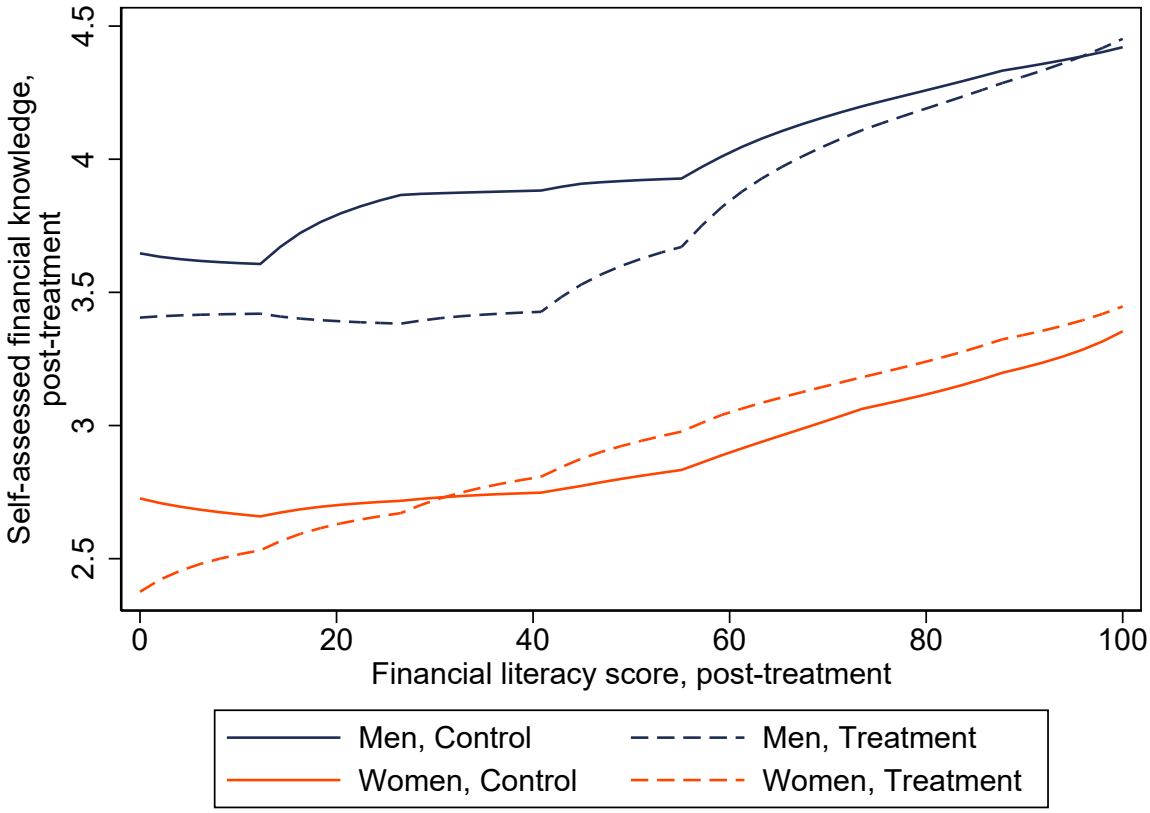
provide an answer. This indicates more self-confidence.

4.2 Self-Assessed Financial Knowledge

Figure 6 plots participants' post-treatment self-assessments of their financial knowledge, against the post-treatment financial literacy scores. Solid curves represent the control group, while dashed curves represent the treatment. Three patterns stand out. First, as expected, all the curves are upward sloping: individuals with higher financial literacy tend to have more confidence in their financial knowledge. Second, for any given level of objectively-measured financial literacy, men have higher confidence in their financial knowledge compared to women. Third, trading in financial assets appears to improve the confidence of high-performing women, and reduce the confidence of low-performing men. The result is a compression of the gender gap in self-assessments.

Table 7 shows the estimated treatment effects (TOT) on self-assessed financial knowledge, controlling for the full set of controls from Table 4. In the sample as a whole, the

Figure 6: **Self-Assessed Financial Knowledge by Gender and Treatment**



Note: Kernel-weighted local polynomial regressions. Dashed lines are for the treatment group, the control is solid. Financial literacy score is the % correct responses to a battery of financial questions (see Table 3). Self-assessed financial knowledge is the response to: "On a scale of 1 to 7, how would you rate your financial knowledge?"

estimated treatment effect is statistically indistinguishable from zero (Column 1). However, this masks a differential effect between men and women. Consistent with the raw patterns seen in Figure 3, the treatment somewhat improves women's self-assessed financial knowledge but, if anything, decreases that of men (Column 2). (The difference in the treatment effect between men and women is significant at 7.5%; the p-value of an increase in self-assessed knowledge for women relative to men is 0.038). In other words, the treatment not only raises the willingness of women to answer financial literacy questions relative to men, but may also narrow the gap in their self-assessed financial knowledge.

Table 7: **Treatment Effects: Self-Assessed Financial Knowledge**

	All		Males	Females
	(1)	(2)	(3)	(4)
Treatment	0.058		-0.107	0.208
	(0.089)		(0.117)	(0.139)
Treatment x Male		-0.103		
		(0.119)		
Treatment x Female		0.250*		
		(0.148)		
Male	0.689***	0.898***		
	(0.192)	(0.221)		
p-value (Treatment [x Male]=[x Female])		0.0751		
R-squared	0.130	0.130	0.098	0.133
Mean Dependent Variable (Control Gp)	3.639	3.639	4.225	3.008
SD	1.450	1.450	1.258	1.381
Observations	1,033	1,033	555	478

Notes: This table shows the treatment effect on the treated (TOT) (Col 1) on an individuals self-assessment of their financial knowledge [on a scale of 1-7], interacted by gender (Col 2), and by gender sub-sample (Cols 3 and 4). All the demographic and other controls above were measured pre-treatment. All columns include 104 strata fixed effects, 4 religiosity categories, and 6 location categories. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

4.3 Willingness to Take Risks

An important debate in psychology and economics concerns the extent to which women tend to be more risk averse than men, and whether this may help explain the gender wage gap (see, e.g. Niederle and Vesterlund, 2011 and Blau and Kahn, 2017.) While women are more risk-averse than men in the general population (Croson and Gneezy, 2009, Falk et al., 2018), studies of financial professionals and entrepreneurs tend to find more muted gender differences in risk tolerance. However, as Blau and Kahn (2017) note: "it is not possible to know whether such findings are due to the type of selection we have just discussed (with more risk-taking individuals of both sexes choosing to enter or remain in particular fields) or learning (people who initially differ in their risk propensities may learn from their professional environment)." Our randomized experiment allows us to

Table 8: **Treatment Effects: Willingness to Take Risks [1-10]**

	All		Males	Females
	(1)	(2)	(3)	(4)
Treatment	0.516***		0.462***	0.639***
	(0.136)		(0.178)	(0.203)
Treatment x Male		0.399**		
		(0.187)		
Treatment x Female		0.657***		
		(0.217)		
Male	0.357	0.511		
	(0.288)	(0.340)		
p-value (χ^2: Treatment [x Male= x Female])		0.385		
R-squared	0.355	0.354	0.350	0.366
Mean Dependent Var (Control Group)	*4.365*	*4.365*	*4.907*	*3.783*
SD	*2.166*	*2.166*	*2.127*	*2.063*
Observations	1,036	1,036	555	481

Notes: Dependent variable is the answer to the question (from Dohmen et al. 2011): ``Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? [from 0: 'not at all willing to take risks' to 10: 'very willing to take risks'], measured post-treatment. All regressions include the full set of controls as Table 4, Col 2. The p-value in Col 2 is from a $\chi 2$ test of equality between the coefficients on the interaction of the treatment with male and the interaction with female. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

isolate learning from selection.

Table 8 estimates the treatment effect on willingness to take risks (on a scale from 1 to 10). Note first that in the control group, women on average report lower willingness to take risks than men (3.8 vs 4.9 on the 10 point scale). The treatment effect is positive for both men and women. However, the point estimates suggest a slightly stronger effect on women. Treated men increase their risk tolerance by between 0.4-0.46 (relative to a mean of 4.9 in the control) while treated women increase their risk tolerance by 0.64-0.66 (relative to 3.8 in the control). The increase in risk tolerance for both men and women (and the possible compression of the gap in risk tolerance) even after a short 4-7 week trading intervention, provide suggestive evidence that learning and experience may be important channels shaping the gender gap in risk tolerance more generally.

4.4 Investment Behavior

Our fourth measure of financial confidence is actual investment in financial markets. An influential body of observational research suggests that *familiarity breeds investment* (e.g. Huberman, 2001). Relatedly, Anagol, Balasubramaniam and Ramadorai (2018) show that investors who won a lottery for specific stocks continue to hold those stocks. We now examine whether experimentally-induced familiarity with the stock market in general has similar effects. We use two measures: investment via our platform; and self-reported investment in the months following the experiment, which constitutes the fourth component of the FCI.

At the end of the study, we gave participants in the long exposure (seven weeks) treatment the option to either cash out their entire portfolios, or to re-invest some of the money they had earned during the experiment in the Tel-Aviv 25 index for another month: until the beginning of May. For context, the top panel of Table 9 shows the proportion of men and women that either bought or sold any stocks in the six months before the experiment. In the full pre-treatment sample (including noncompliers), 44% of the men and 27% of the women had invested. The proportions are very similar among the compliers in the long exposure treatment: 47% and 26%, respectively.

The lower panels of Table 9 show the post-treatment behavior of this same sample. The share of women that chose to re-invest some of their earnings in the TA-25 after the study was a remarkable 41% (compared to 26% who reported trading pre-treatment), while the share among men was 48%, only slightly higher than the 47% pre-treatment. The net result is a much smaller gender gap in stock market participation in this group.

Furthermore, in the July followup financial survey, we resurveyed these individuals, asking them if they had actively invested in financial assets in the two months since May. According to these self-reports, the increased propensities of both female and male participants to invest seem to persist over time, and to extend beyond investment via our platform: around 56% of men and 38% of women in both the long exposure group and

Table 9: **Investment Behavior by Gender**

	Sample	Men		Women	
		Obs	%	Obs	%
Pre-Experiment:					
Bought/ Sold Any Stocks within 6 Mths Prior to Expt. (July 2014- Feb 2015)	Full	579	44.39%	533	26.64%
	Long Exposure Compliers	368	46.74%	289	25.95%
Post-Experiment:					
Re-Invested Any of Portfolio in TA25 (Apr- May 2015)	Long Exposure Compliers	368	48.10%	289	40.83%
(Self- Reported) Actively Invested in Financial Assets (May - July 2015)	Long Exposure Compliers	326	56.40%	250	38.00%
	Full	500	55.40%	433	37.64%

Notes: In April 2015, at the end of the trading experiment, we asked compliers within the long (7 weeks) exposure condition whether they would like to re-invest a portion of their portfolios in the TA 25 index for a month, or instead divest entirely. The second and third rows compare the responses of men and women in the long exposure complier sample to the pre-experimental shares that reported investing in any stocks. The fourth and fifth row show data from the July 2015 follow-up survey. They show the share that reported that they had invested since May (after the experiment) in both the long exposure complier sample and in the full sample.

the full sample reported having actively invested in that two month period. A gender gap is still apparent, but is less pronounced than the pre-treatment gap.[25]

Table 10 estimates the treatment effect on individuals' propensity to invest within the two months after the treatment. This question—collected from both the treated and control groups—forms the fourth component of the FCI. The overall probability that individuals report investing in any financial asset after the experiment increased by about 7.9 percentage points among the treated, relative to an average of 42% in the control (Col 1; the p-value on the t-test of an increase in propensity to invest is 0.008). This treatment effect is very similar in magnitude for both men and women (Col 2), and comparing within samples of otherwise similar men and women (Cols 3-4), but is imprecisely estimated for women. Due to the lower propensities to invest among women on average, these point estimates imply a 16% increase for men but a 21-23% increase

[25]Another indication of increased participation is evident in our weekly surveys. Each week, we traced whether individuals reported buying or selling stocks *outside* the experiment. As shown in Appendix Figure A5, there was a steady weakly increase in the proportion engaging in external trading over the course of the experiment among both men and women, though the initial levels were higher for men.

Table 10: **Active Investment in Financial Assets After the Experiment**

	All		Males	Females
	(1)	(2)	(3)	(4)
Treatment	0.079**		0.079*	0.070
	(0.033)		(0.042)	(0.051)
Treatment x Male		0.079*		
		(0.044)		
Treatment x Female		0.078		
		(0.053)		
Male	0.053	0.052		
	(0.079)	(0.091)		
p-value (t[Treatment>0])	0.00820		0.0309	0.0841
R-squared	0.130	0.130	0.098	0.133
Mean Dependent Var (Control Group)	*0.421*	*0.421*	*0.505*	*0.333*
SD	*0.495*	*0.495*	*0.502*	*0.474*
Observations	933	933	500	433

Notes: This table shows the treatment effect on the treated (TOT) (Col 1) on the propensity to invest in financial assets one-two months after the experiment- between May and July 2015- interacted by gender (Col 2), and by gender sub-sample (Cols 3 and 4). The precise question was ``*In the past couple of months (that is, since May 2015), have you invested in stocks, bonds, mutual funds or other financial assets (not including any possible investments made by your pension or provident fund)?*" All regressions include the full set of controls as Table 4, Col 2. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

for women relative to the control.

Given the importance of investment activity as an outcome in its own right, before concluding this section it might be of interest to ask which of the three other components—financial literacy, self-assessments and risk tolerance—can best explain the treatment effect on the propensity to invest in stocks. This exercise suggests that the change in women's self-assessments of their financial knowledge is the most influential and the change in risk tolerance the least.

To sum up, a combination of indicators—both survey and behavior-based—suggest that trading in stocks raises financial confidence and compresses the gender gap. Treated women are more willing to answer financial literacy questions, and answer them correctly; they have higher self-assessments of their own knowledge; report higher willingness to

take risks; and ultimately are more likely to invest in stocks. Most of these effects also show up for men, but tend to be smaller in size.

5 Mechanisms

Recall from Table A2 that our treatment had several (cross-randomized) conditions, varying different dimensions of the intensity of the treatment: how much stake you have in the game ($50 or $100), for how long (four weeks with three decisions or seven weeks with six decisions); and how much of that stake is in stocks (depending on whether participants were initially assigned stocks or vouchers to invest in stocks).[26] In this section we exploit these variations to try to better understand which aspects of the treatment drive the results. We also use data from the weekly financial surveys (available for compliers in the treatment group), to examine gender differences in engagement with the treatment. Finally, we examine differences in patterns of financial advice-seeking in the treatment and control. The analysis in this section is exploratory and suggestive in nature, but it may help shed light on the processes underlying our main result.

5.1 Treatment Intensity

Table 11 examines the relative effects of receiving more intense treatments on the FCI.[27] The first thing to note is that, by and large, the lion's share of the treatment effect is realized even with the less intensive treatments, i.e. with $50 of assets, four weeks of exposure, or portfolios that are less exposed to stocks (the voucher treatment). This is important when thinking about possibly implementing this method for improving women's financial confidence at scale, as it suggests that meaningful gains can be achieved at relatively low cost. Having higher endowments of stocks—either because the portfolio

[26] Recall that participants in the voucher treatment started out with zero stocks in their portfolio and could at most use 10% of the portfolio to buy stocks each week. The reverse was true for the stock treatment who started with 100% stocks.

[27] Appendix Table A10 reports the results for each of the four components of the FCI.

Table 11: **Treatment Intensity and Financial Confidence**

	All	Male	Female	All	Male	Female	All	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$50 Endowment	0.119***	0.071	0.150**						
	(0.041)	(0.049)	(0.067)						
$100 Endowment	0.178***	0.115**	0.275***						
	(0.039)	(0.048)	(0.066)						
Four Week Exposure				0.183***	0.150***	0.221***			
				(0.041)	(0.050)	(0.067)			
Seven Week Exposure				0.132***	0.064	0.210***			
				(0.039)	(0.047)	(0.064)			
Voucher Treatment							0.153***	0.122**	0.153*
							(0.048)	(0.057)	(0.083)
Stock Treatment							0.149***	0.086*	0.228***
							(0.037)	(0.045)	(0.060)
R-squared	0.385	0.358	0.378	0.386	0.362	0.375	0.385	0.359	0.377
Prob>p [Equality of Sub-Treatment Coeffs.]	0.111	0.321	0.0512	0.165	0.0480	0.855	0.929	0.481	0.309
Mean Dependent Var (Control Group)	-0.001	0.269	-0.291	-0.001	0.269	-0.291	-0.001	0.269	-0.291
SD	0.679	0.598	0.643	0.679	0.598	0.643	0.679	0.598	0.643
Observations	1,037	555	482	1,037	555	482	1,037	555	482

Notes: Dependent variable is the the Financial Confidence Index. Treatment Effect On the Treated (TOT: 2SLS) estimates of different sub-treatments. All regressions include the full set of controls from Table 4, Col 2. The p-value is from a chi-squared test of equality of the sub-treatment coefficients. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1.

has a higher initial value or a higher initial exposure to stocks—does appear to increase financial confidence somewhat more for women, but the incremental gains from the more intensive treatments are statistically significant only in the former case.

Interestingly, while women show similar gains in financial confidence following short and long durations of treatment, men's gains are concentrated in the short duration and largely disappear following a longer duration. This is consistent with the patterns seen in Section 4.1 and the notion that, left to their own devices, men might actually be overconfident about their financial prowess (Barber and Odean, 2001). Longer experience may, however, help temper such tendencies.

In Appendix Table A12 we also explore the possible differential effects of being assigned different assets. By randomly assigning each individual to an asset, we exoge-

nously assign individuals to assets that increase or decrease in price, and that have different volatilities. Assets may also be domestic or foreign. By and large the treatment effects on financial confidence are quite similar across the different assets. In Appendix Table A13 we examine whether exposure to index funds might teach individuals more about asset diversification than exposure to an individual stock. The point estimates are consistent with this possibility.[28]

5.2 Engagement with the Stock Market

To shed further light on the mechanism, we can see if men and women in the treatment group show different levels of engagement, achieve different returns, and ultimately receive different feedback during the study.

Table 12 shows differences between otherwise similar female and male compliers that we summarize in a Z-Score index (Col 1), before breaking it down into each individual measure (Cols 2-6). It would be curious if women invested less time and engaged less with the study but ended up gaining more confidence. Instead, we find that women were more engaged in the study overall (Col 1). Not only did women spend more time on the surveys (Col 2), they were also more likely to get more factual questions on their assigned asset correct (Col 3; the questions were administered before participants received our summary of the performance of their portfolio in the past week, and asked about the sector of their assigned asset and about its past performance). In fact, as the table shows,

[28] Although many individuals have a conceptual understanding of the importance of portfolio diversification (81% of our sample at baseline (Table 3), understanding how to practically apply this concept has proven among the most difficult to teach (Lusardi and Mitchell, 2014). Thus, two months after the experiment, in the July followup survey, we add the following from Lusardi and Mitchell's 2014 *Big Three* questions: "True or False: Buying a single company's stock usually provides a safer return than a stock mutual fund." (The other two are the basic numeracy and compound interest questions from Table 3). Appendix Table A13 shows that both company stocks and index funds have large effects on increasing the probability that treated individuals get all *Big Three* questions correct, by 8.1pp when exposed to company stocks and 12.4pp when exposed to index funds, relative to an average of 34.3% who got all questions correct in the control. These effects are reflected in the relative riskiness of stocks question as well. Once again, the point estimates are more marked for women, with an increase of 18.3pp among women exposed to index funds and 13.9pp for those exposed to company stocks. These are large effects considering that only 31.7% of women in the control group got this answer correct.

Table 12: **Engagement and Performance**

	(1) Engagement Index (Z-Score)	(2) Cum. Time Spent on Surveys	(3) Asset Past Performance: Facts Correct [0-3]	(4) Next Week's Price Prediction Strictly Wrong	(5) # Decisions Registered [0-3]	(6) # Non-Zero Trades [0-3]	(7) % Excess Return over Passive Investment
Time-Span	by Mar 4	by Mar 4	on Mar 4	on Mar 4	by Mar 4	by Mar 4	Endline (Mar/ Apr)
Female	0.334***	0.782*	0.452**	-0.198*	0.161	0.184	0.589
	(0.128)	(0.404)	(0.182)	(0.115)	(0.125)	(0.260)	(2.183)
Pre-Treat Fin. Literacy [1-7]	0.043**	0.118**	0.115***	-0.010	0.032	-0.006	0.572
	(0.021)	(0.057)	(0.032)	(0.015)	(0.022)	(0.035)	(0.374)
Mean Dep Var (Males)	*0.0577*	*7.239*	*1.907*	*0.353*	*2.718*	*1.929*	*-6.857*
SD	*0.636*	*1.864*	*0.984*	*0.478*	*0.671*	*1.193*	*11.11*
Observations	700	700	700	700	700	700	700
R-squared	0.267	0.211	0.235	0.182	0.277	0.200	0.258

Notes: Each column reports an OLS regression among compliers. All regressions include the same controls and strata fixed effects as Table 4, Col 2 except we replace pre-treatment financial literacy score dummy variables with the single 1-7 variable above for ease of interpretation. Cols 1-6 examine participant engagement as of March 4, the last date at which both short and long duration participants took the same survey. The Dependent variable in Col 1 (Engagement Index) is a Z-Score index of the measures in Columns 2-6. These include: Col 2: the cumulative time spent on the investment surveys over three surveys (converted into deciles). Col 3: the number of correct responses to the following three questions about the individual's assigned asset: (A) which sector was the stock, (B) what was its price movement (up/ down/ flat) over the past week, and (C) over the past three years. Col 4: a strictly wrong prediction of the stock's movement the following week. Col 5: the number of decisions registered before March 4 (including hold decisions). Col 6: the number of active buy or sell decisions. The dependent variable in Col 7 is the % excess return on each complier's experimentally assigned portfolio over an investor with the same asset who registered a hold decision on the stock every week, calculated at the time of divestment (March 12 or April 2). Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

in their levels of engagement and knowledge of asset performance, women are mimicking the behaviour of those with higher pre-treatment financial literacy. Men in contrast, tend to get fewer answers right and hence receive more negative feedback on their knowledge, even controlling for ex-ante financial literacy. Moreover, men are also 20pp more likely to make incorrect predictions of the asset's subsequent performance (Col 4).[29] These differences can help explain why women in the study gained confidence in their financial knowledge, while men became more reserved in their self-assessments.

To some extent, women's engagement in the study is also reflected in the number of trades they undertake. Women in our study do not trade less than men—if anything they trade slightly more often (Cols 5-6). Finally, Column 7 in Table 12 examines the

[29]Part of this may reflect the fact that men tend to be 10pp-20pp more likely to be over-optimistic about their asset's performance each week than women assigned the same asset, though this attenuates by the end of the study (see Appendix Figure A6). This appears consistent with the patterns noted by Eckel and Fullbrün (2015).

excess returns attributable to participant trading decisions by the end of the study. Here too, women do at least as well as otherwise similar men, if not slightly better.

5.3 Self Reliance and Seeking Financial Advice

In principle, financial advice could be a complement or a substitute to an individual's own financial knowledge (Collins, 2012, Von Gaudecker, 2015). In the post-treatment financial survey, we asked each individual: "When you made investment decisions in the past, whom did you consult?" allowing individuals to tick all possibilities that applied.

Table 13, Panel A examines the likelihood that individuals consult other people in their financial decisions. Both treated men and treated women become much less likely than their control equivalents to consult other people. Treated men and women reduce their propensities to consult family members by around 23pp, while men also reduce their propensities to consult friends by 26.2pp and women by 12.6 pp, magnitudes the approach the entire shares that consulted friends in the control. Importantly, treated individuals become 41.6pp less likely to consult professional financial advisors as well, this effect reflecting a decrease of 36.5pp in the probability for treated men and 45pp for treated women. These effects are particularly worth noting in light of an increasing body of work that suggests that financial advisors often steer clients, particularly women, towards more costly financial products (Hackethal, Haliassos and Jappelli, 2012, Inderst and Ottaviani, 2012, Mullainathan, Noeth and Schoar, 2012).

Panel B examines how the treatment affects individuals' propensities to consult online and published sources of financial information on their own. Relative to the control, about 15 pp more of both treated men and treated women reported consulting the *investing.com* website that we had repeatedly referred them to during the experimental investment period (note that hardly anyone in the control group used this site). Investing.com appears to substitute for other financial news websites, but not newspapers. In Jha and Shayo (2019), we further confirm that treated individuals increased the number

Table 13: **Whom Did you Consult?**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. People	Family			Friends			Financial Advisor		
	All	Males	Females	All	Males	Females	All	Males	Females
Treatment	-0.234***	-0.259***	-0.211***	-0.223***	-0.262***	-0.126***	-0.416***	-0.365***	-0.450***
	(0.033)	(0.041)	(0.051)	(0.029)	(0.042)	(0.036)	(0.031)	(0.043)	(0.042)
Male	-0.152**			0.118**			-0.102*		
	(0.066)			(0.059)			(0.060)		
R-squared	0.120	0.188	0.139	0.149	0.211	0.117	0.326	0.295	0.413
Mean DV (Control)	*0.382*	*0.341*	*0.425*	*0.277*	*0.357*	*0.192*	*0.438*	*0.403*	*0.475*
SD	*0.487*	*0.476*	*0.496*	*0.448*	*0.481*	*0.395*	*0.497*	*0.492*	*0.501*
B. Sources	Investing.com			Other Web Financial Newsites			Newspapers		
	All	Males	Females	All	Males	Females	All	Males	Females
Treatment	0.149***	0.169***	0.136***	-0.157***	-0.187***	-0.100***	-0.028	-0.034	-0.002
	(0.016)	(0.022)	(0.024)	(0.030)	(0.043)	(0.037)	(0.021)	(0.032)	(0.026)
Male	0.003			0.063			0.040		
	(0.048)			(0.057)			(0.045)		
R-squared	0.077	0.102	0.132	0.066	0.109	0.068	0.040	0.065	0.067
Mean DV (Control)	*0.00402*	*0*	*0.00833*	*0.269*	*0.364*	*0.167*	*0.100*	*0.140*	*0.0583*
SD	*0.0634*	*0*	*0.0913*	*0.444*	*0.483*	*0.374*	*0.301*	*0.348*	*0.235*
C. Other/None	Other News Sites			Other			No One		
	All	Males	Females	All	Males	Females	All	Males	Females
Treatment	-0.036	-0.061	-0.007	-0.009	-0.020	-0.005	0.435***	0.421***	0.414***
	(0.024)	(0.037)	(0.028)	(0.009)	(0.014)	(0.010)	(0.032)	(0.043)	(0.049)
Male	0.017			-0.014			0.099		
	(0.045)			(0.026)			(0.064)		
R-squared	0.023	0.032	0.073	0.047	0.100	0.080	0.215	0.256	0.220
Mean DV (Control)	*0.124*	*0.163*	*0.0833*	*0.0161*	*0.0233*	*0.00833*	*0.185*	*0.171*	*0.200*
SD	*0.331*	*0.371*	*0.278*	*0.126*	*0.151*	*0.0913*	*0.389*	*0.378*	*0.402*
Observations	1,037	555	482	1,037	555	482	1,037	555	482

This table shows the treatment effect on the treated (TOT: 2SLS) estimates on the probability an individual selected the particular source in each column in response to the question: ``when you made investment decisions in the past, whom did you consult? Please choose all that apply." All regressions include the full set of controls as Table 4, Col 2. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

of financial news sources they read, and become more aware of the performance of the stock market, even without changing their consumption of news more generally, or their knowledge of other salient economic and political facts. We also find that this increased propensity to follow financial news lasts even a year after the study. Finally, for completeness, Panel C examines whether the effect is causing a substitution to other sources

of information not already mentioned. There does not seem to be a significant effect for either men or women consulting other sources. Both treated women and men were more than 40pp more likely to say they consulted *no one* in their financial decisions.

Taken together, Table 13 suggests that the treatment made both men and women more self-reliant and more willing to access financial information on their own rather than depending on the advice of others.

6 Conclusion

Gender gaps in financial confidence, knowledge and participation have remained stubbornly persistent, despite important advances made by women in educational attainment and in the labor market. Since participation, confidence in one's own abilities, and knowledge are probably mutually-reinforcing, an intervention that increases one of these elements may increase the others as well. We conduct the first experiment outside a classroom setting to assign individuals incentives, opportunities and nudges to trade in actual financial assets. Results suggest that this not only encourages subjects to participate and learn, but does so in a manner that helps compress the gender gap in confidence and subsequent financial market participation.

Increases in economic and political uncertainty (Baker, Bloom, Davis and Kost, 2019), coupled with strained social safety nets, have accentuated the importance of managing risks, and thus of developing basic understanding and capabilities to participate in financial markets. Our research design indicates a potentially fruitful way to achieve these goals, even among time-constrained and hard to reach working-age populations. Indeed, the increases in financial literacy we observe are comparable in size to those of more standard educational programs.

More generally, stock market participation, carefully designed to encourage learning, may affect broader social tendencies. As we have seen, it can affect willingness to take risks. And as Jha and Shayo (2019) and Margalit and Shayo (2020) show, it can, at times,

also shape (contentious) social values and attitudes towards economic policies. Last but not least, it may help individuals focus upon and share in the common economic gains to society from specific policies, and provide non-partisan metrics for evaluating them, thereby potentially mitigating political polarization and conflict (Jha, 2012, 2015, Jha and Shayo, 2019).

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SUPPLEMENTAL APPENDIX (FOR ONLINE PUBLICATION)
SAUMITRA JHA AND MOSES SHAYO

Note: All survey instruments used in this study are available on our websites. See e.g.: `web.stanford.edu/~saumitra/papers/JhaShayo_Finance_SurveyInstruments.pdf`.

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Figure A1: Initial Allocation Screen: Example.

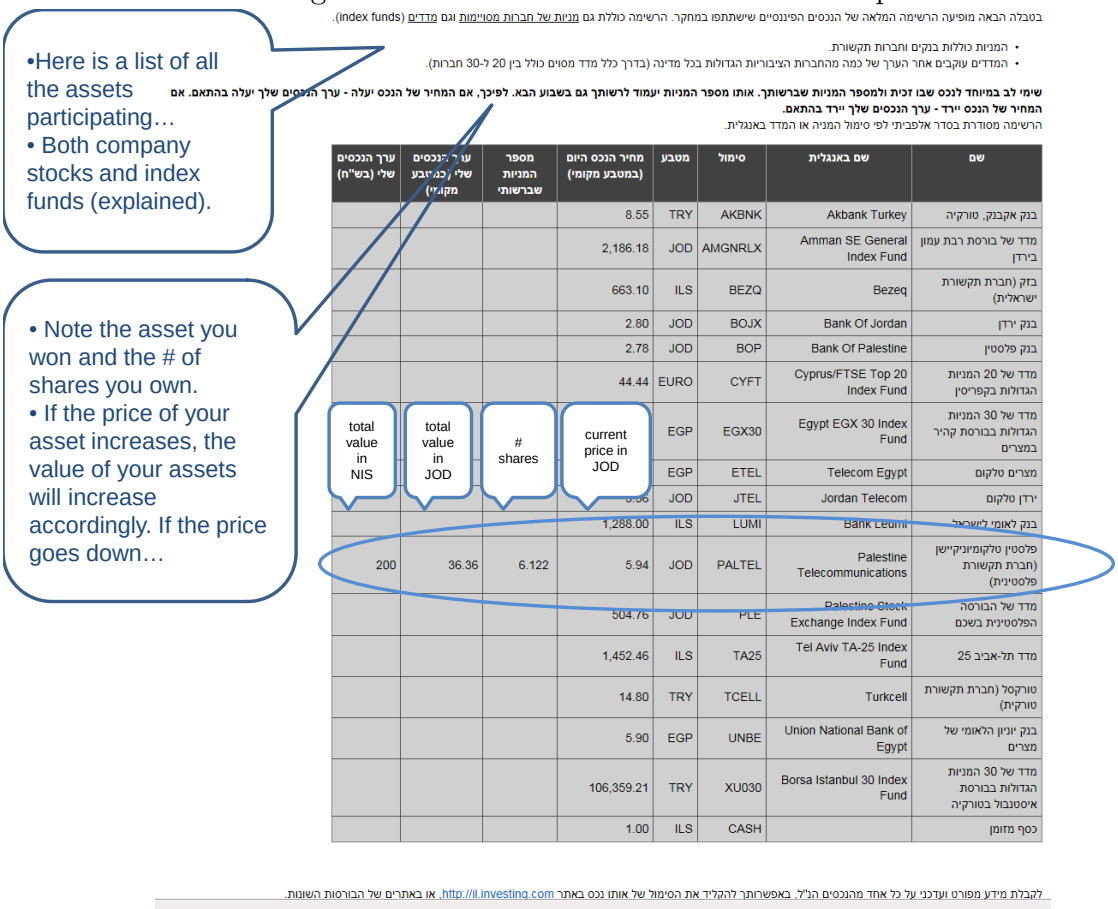


Figure A2: Weekly Trading Screen: Example.

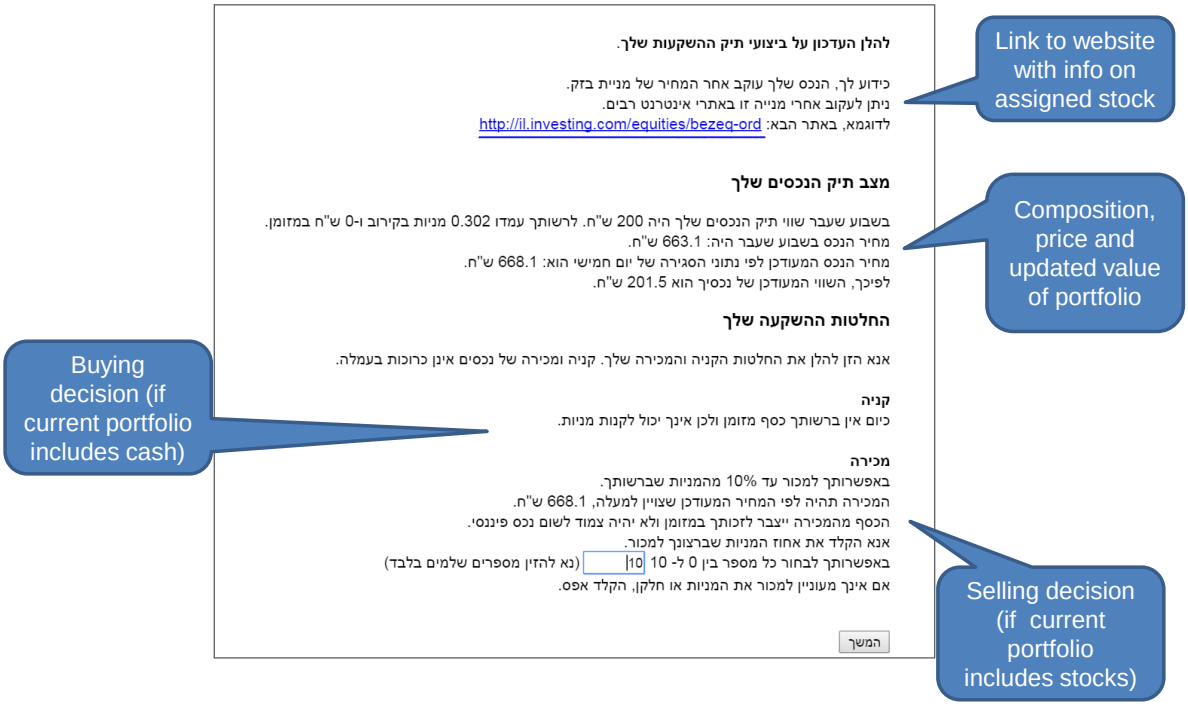
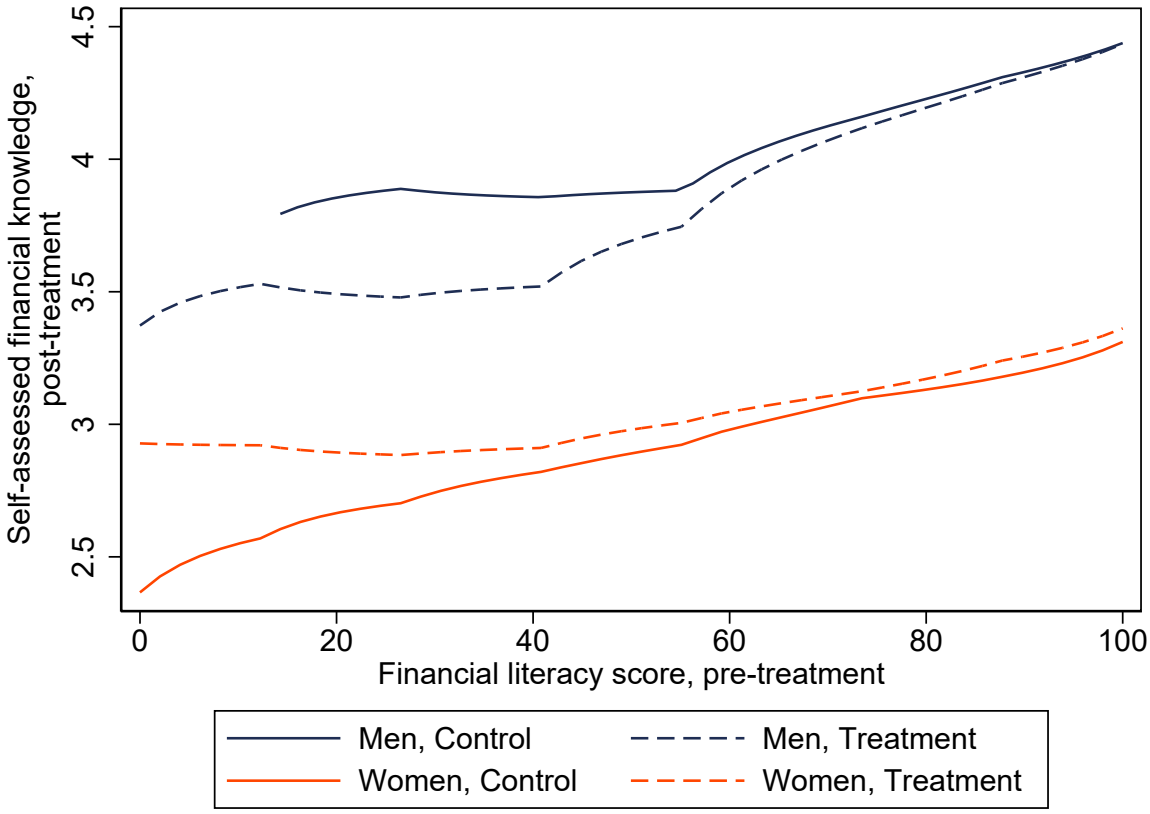


Figure A3: Open Question: What did you learn from this study?

Note: Responses to an open-ended question at the end of the trading period (e.g. March 12 or April 2): "What did you learn from the study?" Respondents include only the compliers.

Figure A4: Self-Assessed Financial Knowledge by Gender and Pre-Treatment Literacy



The figure compares self-assessed financial knowledge among treatment and control plotted against their *pre-treatment* financial literacy scores. Dashed lines represent kernel-weighted local polynomial regression for the treatment group, with solid lines for the control.

Figure A5: Did Compliers Buy and Sell Outside Stocks During the Experiment?

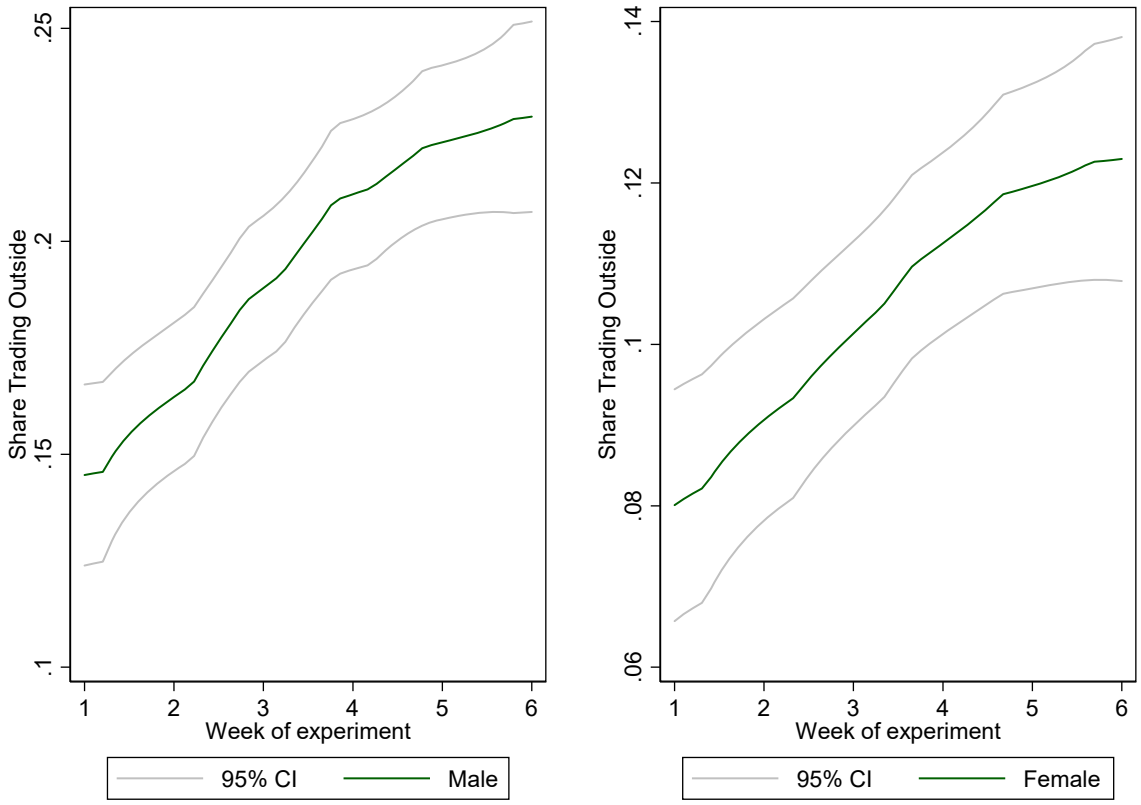
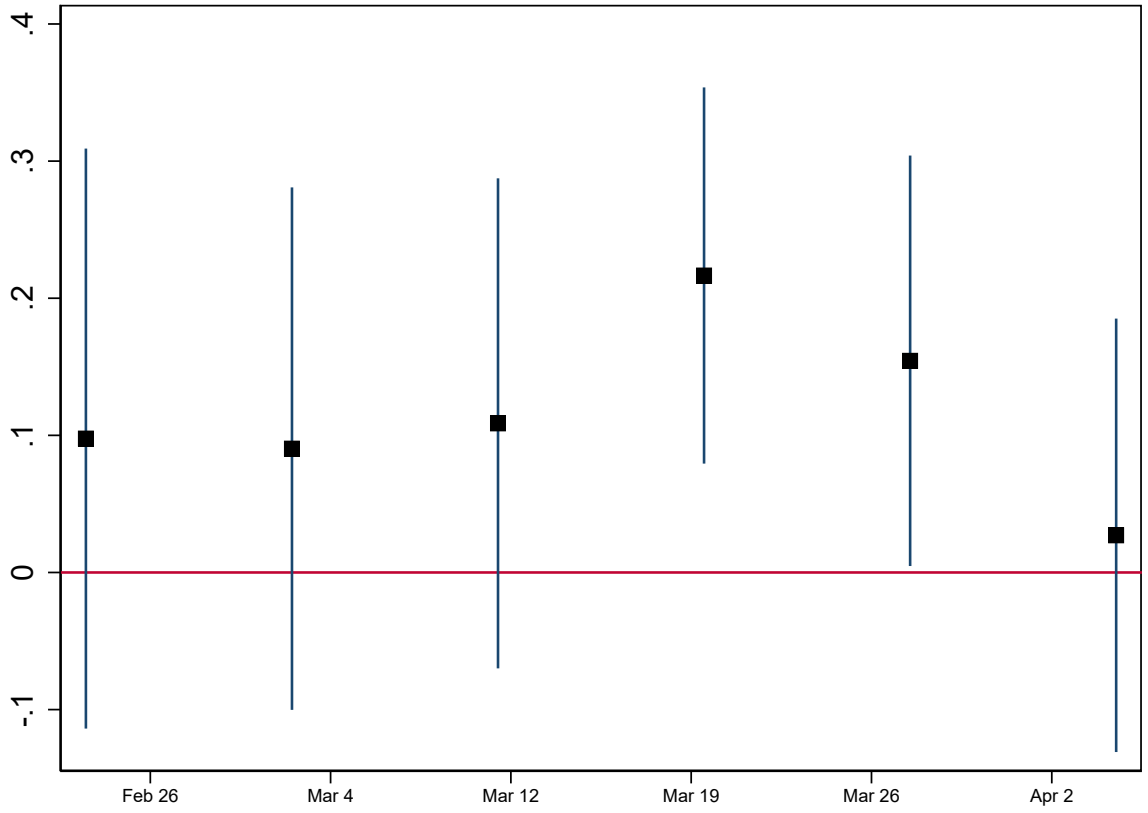


Figure A6: Are Male Compliers More Optimistic than Females about Asset Performance?



The figure shows the coefficient (with 90% CI) on being male based upon weekly OLS regressions on whether the individual predicted their stock would go up (versus stay flat or fall) in the subsequent week, controlling for the full set of controls in Table 4, Column 2, a dummy variable for late divestment as well as fixed effects for each stock.

Table A1: **Comparison of the Sample and the Israeli Population**

		Baseline Sample (N = 1345)	Prime-Age Sample (N=1035)	Israeli Jewish Population
1. Region: Jewish Population in District (%)				
	Jerusalem District	9.4	9.7	11.1
	Northern District	9.5	9.8	9.5
	Haifa District	13.7	13.5	10.7
	Central District	29.2	28.9	28.5
	Tel Aviv District	19.8	20.7	20.2
	Southern District	10.6	10.5	14.2
	West Bank	7.8	7	5.8
2. % Female in Jewish Pop., 18+		48.3	46.4	51.4
3. Age (Jewish Population above age 18 (%))				
Male	18-24	10.1	0	14.6
	25-34	29.6	35	20.4
	35-44	28.1	33.7	18.7
	45-54	15	18	14.7
	55-64	9.6	12.1	15.1
	65+	7.6	1.3	16.5
Female	18-24	14.2	0	13.3
	25-34	29.7	35.6	19.2
	35-44	26.3	31.9	17.9
	45-54	14	16.9	14.6
	55-64	10.5	13.8	15.5
	65+	5.4	1.9	19.5
4. Religiosity (Jewish Population, %)				
	Not religious/Secular	63.1	65.1	43.4
	Traditional	16.8	15.9	36.6
	Religious	11.9	11.3	10.6
	Ultra-orthodox	8.2	7.6	9.1
5. Education (Jewish Population level of schooling (%))				
	Less than high school grad (0 to 10 yrs.)	5.8	5.2	13.7
	High school graduate (11 to 12 yrs.)	13.7	12.6	33.3
	Post-secondary/BA Student (13 to 15 yrs.)	38.2	34.7	24.1
	College grad and above (16+ yrs.)	42.3	47.5	28.9
6. Net Monthly Income per Household (NIS)				
	Mean	10766	11283	14,622
	Median	12000	12000	13,122

The prime-age sample includes only participants who completed at least one of the post-treatment financial surveys.

1. Statistical Abstract of Israel 2015, Table 2.15, 2014 Totals

2. Statistical Abstract of Israel 2015, Table 8.72, 2014 Totals

3. Statistical Abstract of Israel 2015, Table 8.72, 2014 Totals

4. Statistical Abstract of Israel 2015, Table 7.6, 2013 Totals. The data for the Israeli population is for age 20 and over.

5. Statistical Abstract of Israel 2015, Table 8.72, 2014 Totals

6. Statistical Abstract of Israel 2015, Table 5.27, 2013 Total (mean). Median is midpoint between 5th and 6th deciles. Data are for entire population, not just Jewish. Survey data represents midpoint of SES categories.

Table A2: **Assignment to Treatments (All-Ages Sample)**

	Total	Short Duration			Long Duration		
		All	NIS 200	NIS 400	All	NIS 200	NIS 400
Treatment	1036						
Voucher to Invest	206	64	32	32	142	71	71
Domestic Stocks	414	141	70	71	273	136	137
Foreign Stocks	416	141	71	70	275	137	138
Control	309						

Table A3: **Treatment Effects: Financial Confidence Index (All-Ages Sample)**

	Full Sample					Males	Females
	ITT	ITT	TOT	ITT	TOT	TOT	TOT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment	0.120***	0.115***	0.122***			0.061	0.194***
	(0.045)	(0.033)	(0.033)			(0.041)	(0.053)
Treatment x Male				0.064	0.061		
				(0.042)	(0.042)		
Treatment x Female				0.173***	0.195***		
				(0.051)	(0.055)		
Male		0.205***	0.201***	0.284***	0.283***		
		(0.079)	(0.074)	(0.090)	(0.085)		
Bought/Sold Shares in Last 6 Mths [0/1]		0.414***	0.409***	0.410***	0.406***	0.277***	0.675***
		(0.060)	(0.057)	(0.060)	(0.057)	(0.101)	(0.130)
Age [Yrs]		-0.012	-0.012	-0.012	-0.011	-0.009	-0.015
		(0.008)	(0.008)	(0.008)	(0.008)	(0.010)	(0.013)
Age [Yrs] Squared		0.000*	0.000*	0.000	0.000*	0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Post Secondary Education		0.021	0.021	0.020	0.018	-0.028	0.079
		(0.048)	(0.045)	(0.048)	(0.045)	(0.062)	(0.068)
BA Student		0.035	0.037	0.035	0.034	0.011	0.047
		(0.053)	(0.050)	(0.053)	(0.051)	(0.073)	(0.073)
BA Graduate and Above		0.013	0.016	0.009	0.011	0.061	-0.026
		(0.044)	(0.041)	(0.044)	(0.042)	(0.058)	(0.060)
Married		0.062*	0.060*	0.063*	0.061*	-0.008	0.145***
		(0.034)	(0.032)	(0.034)	(0.032)	(0.045)	(0.047)
Family Income [10,000s NIS]		0.043	0.040	0.042	0.040	0.058	0.015
		(0.029)	(0.027)	(0.029)	(0.028)	(0.036)	(0.044)
Traditional		0.057	0.060	0.053	0.055	-0.024	0.120*
		(0.043)	(0.041)	(0.043)	(0.041)	(0.050)	(0.064)
Religious		0.026	0.026	0.023	0.024	0.065	-0.013
		(0.063)	(0.059)	(0.062)	(0.059)	(0.084)	(0.084)
Ultra-Orthodox		0.025	0.021	0.020	0.017	0.121	0.016
		(0.087)	(0.082)	(0.086)	(0.082)	(0.096)	(0.135)
Tel Aviv		0.061	0.063	0.067	0.069	0.016	0.105
		(0.050)	(0.048)	(0.050)	(0.048)	(0.062)	(0.083)
Willing to Take Risks [1-10]		0.078***	0.078***	0.078***	0.077***	0.065***	0.094***
		(0.007)	(0.007)	(0.007)	(0.007)	(0.009)	(0.010)
Time preference above median		0.026	0.027	0.026	0.029	0.051	0.002
		(0.032)	(0.030)	(0.032)	(0.030)	(0.039)	(0.047)
Pre-Treat Financial Literacy Score FEs	No	Yes	Yes	Yes	Yes	Yes	Yes
p-value (Treatment [x Male= x Female])				0.0972	0.0667		
Mean Dependent Variable (Control Group)	-0.00167	-0.00167	-0.00167	-0.00167	-0.00167	0.274	-0.294
SD	0.682	0.682	0.682	0.682	0.682	0.594	0.648
R-squared	0.006	0.556	0.554	0.557	0.359	0.336	0.341
Observations	1,247	1,247	1,247	1,247	1,247	658	589

Notes: This table shows the Intent to Treat (ITT: OLS, Cols 1, 2,4) and Treatment Effect On the Treated (TOT: 2SLS, Cols 3, 5-7) estimates of financial asset exposure on a Z-Score Index containing the following four post-treatment elements: financial literacy score, self-assessed financial knowledge, willingness to take risks and an indicator for financial investment (measured in July). Apart from the latter, these were measured in the March- April post-treatment surveys, supplemented by their July equivalents for missing respondents. We also show the treatment effect interacted with gender (Col 4-5), and separately by gender sub-sample (Cols 6 and 7) . All the demographic and other controls were measured pre-treatment. In addition to the controls above, Cols 2-7 also include 104 strata fixed effects, 4 religiosity categories, and 6 location categories (the excluded category is the Center District), and a dummy variable for respondents appearing in the July survey.The p-value in cols 4-5 is from a test of equality between the coefficients on Treatment x Male and Treatment x Female. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

Table A4: **Treatment Effects: Financial Literacy (All-Ages Sample)**

% Correct Financial Literacy Test, Post-Treatment	(1) All TOT	(2) All TOT	(3) Males TOT	(4) Females TOT
Treatment	4.942***		3.199**	7.377***
	(1.224)		(1.434)	(2.098)
Treatment x Male		3.066**		
		(1.497)		
Treatment x Female		7.162***		
		(2.161)		
Male	3.418	5.923*		
	(2.721)	(3.177)		
Pre-Treat Financial Literacy Score Fixed Effects	Yes	Yes	Yes	Yes
p-value (χ^2: Treatment [x Male= x Female])		0.134		
Mean of the Dependent Variable	72.42	72.42	77.96	66.19
SD	23.61	23.61	21.26	24.55
R-squared	0.512	0.415	0.499	0.358
Observations	1,244	1,244	658	586

asset exposure on the % of 7 financial literacy questions answered correctly in our March- April post-treatment surveys, supplemented by their July equivalents for missing respondents. We also show the TOT interacted by gender (Col 2), and by gender sub-sample (Cols 3 and 4) . All the demographic and other controls above were measured pre-treatment. All regressions include the full set of controls as Table 4, Col 2. The p-values are from a $\chi 2$ test of equality between the coefficients on Treatment x Male and Treatment x Female. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

Table A5: **Treatment Effects: "Don't Knows" and Incorrect Responses (All-Ages Sample)**

	% "Don't Knows"				% Wrong (Neither Correct nor DK)			
	(1) All	(2) All	(3) Males	(4) Females	(5) All	(6) All	(7) Males	(8) Females
Treatment	-2.936***		-1.774*	-4.475***	-1.875*		-1.409	-2.735
	(0.888)		(0.984)	(1.471)	(1.039)		(1.297)	(1.748)
Treatment x Male		-1.543				-1.361		
		(1.075)				(1.319)		
Treatment x Female		-4.588***				-2.485		
		(1.588)				(1.776)		
Male	-5.524***	-7.382***			1.842	1.156		
	(1.723)	(2.206)			(2.256)	(2.647)		
Mean Dependent Variable (Control Group)	*10.73*	*10.73*	*5.882*	*15.87*	*20.25*	*20.25*	*17.93*	*22.72*
SD	*19.14*	*19.14*	*13.86*	*22.42*	*18.16*	*18.16*	*16.67*	*19.37*
p-value (χ^2: Treatment [x Male= x Female])		0.128				0.624		
Observations	1,243	1,243	658	585	1,243	1,243	658	585
R-squared	0.403	0.403	0.239	0.489	0.305	0.305	0.391	0.241

Notes: Dependent variable are: the percent of financial literacy questions answered "don't know" (Cols 1-4); and the percent answered neither correctly nor "don't know" (Cols 5-8) . All outcomes are measured in Mar - April 2015, supplemented by their July equivalents for missing respondents. This table shows the treatment effect on the treated (TOT) (Cols 1,5), interacted by gender (Cols 2,6), and by gender sub-sample (Cols 3-4, 7-8). All regressions include the full set of controls from Table 4, as well as the pre-treatment dependent variable. The p-values in columns 2 and 6 are from a $\chi 2$ test of equality between the coefficients on (Treatment x Male) and (Treatment x Female). Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1.

Table A6: **Treatment Effects on Self-Assessed Financial Knowledge (All-Ages Sample)**

	All		Males	Females
	(1)	(2)	(3)	(4)
Treatment	-0.027		-0.216**	0.160
	(0.083)		(0.110)	(0.130)
Treatment x Male		-0.210*		
		(0.114)		
Treatment x Female		0.189		
		(0.135)		
Male	0.642***	0.886***		
	(0.196)	(0.222)		
p-value (Treatment [x Male]=[x Female])		0.0307		
R-squared	0.389	0.198	0.171	0.207
Mean Dep Var (Control Group)	*3.690*	*3.690*	*4.301*	*3.042*
SD	*1.463*	*1.463*	*1.262*	*1.384*
Observations	1,242	1,242	658	584

Notes: This table shows the treatment effect on the treated (TOT) (Col 1) on an individuals self-assessment of their financial knowledge [on a scale of 1-7], interacted by gender (Col 2), and by gender sub-sample (Cols 3 and 4). All the demographic and other controls above were measured pre-treatment. All columns include 104 strata fixed effects, 4 religiosity categories, and 6 location categories. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

Table A7: **Active Investment in Financial Assets After Experiment (All-Ages Sample)**

Full Sample	All		Males	Females
	(1)	(2)	(3)	(4)
Treatment	0.054*		0.050	0.056
	(0.031)		(0.039)	(0.047)
Treatment x Male		0.058		
		(0.041)		
Treatment x Female		0.050		
		(0.050)		
Male	0.012	0.007		
	(0.076)	(0.088)		
p-value (t[Treatment>0])	0.0380		0.101	0.120
p-value ($\chi^{2:}$Treatment [x Male= x Female])		0.896		
R-squared	0.123	0.123	0.084	0.132
Mean Dependent Variable (Control Group)	*0.447*	*0.447*	*0.530*	*0.360*
SD	*0.498*	*0.498*	*0.501*	*0.482*
Observations	1,118	1,118	588	530

Notes: This table shows the treatment effect on the treated (TOT) (Col 1) on the propensity to invest in financial assets one-two months after the experiment- between May and July 2015- interacted by gender (Col 2), and by gender sub-sample (Cols 3 and 4). The precise question was ``*In the past couple of months (that is, since May 2015), have you invested in stocks, bonds, mutual funds or other financial assets (not including any possible investments made by your pension or provident fund)?*" All regressions include the full set of controls as Table 4, Col 2. The p-values are, respectively, from a t-test that the treatment had a positive effect on investment, and from a $\chi 2$ test of equality between the coefficients on the interaction of the treatment with male and the interaction with female. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

Table A8: **Whom Did You Consult? (All-Ages Sample)**

A. People	(1)	(2) Family	(3)	(4)	(5) Friends	(6)	(7)	(8) Financial Advisor	(9)
	All	Males	Females	All	Males	Females	All	Males	Females
Treatment	-0.218***	-0.237***	-0.199***	-0.210***	-0.252***	-0.136***	-0.447***	-0.400***	-0.487***
	(0.030)	(0.038)	(0.047)	(0.027)	(0.037)	(0.036)	(0.029)	(0.040)	(0.041)
Male	-0.142**			0.110*			-0.096*		
	(0.064)			(0.057)			(0.057)		
R-squared	0.116	0.189	0.118	0.130	0.196	0.091	0.330	0.308	0.393
Mean DV (Control)	*0.370*	*0.327*	*0.417*	*0.259*	*0.327*	*0.188*	*0.465*	*0.431*	*0.500*
SD	*0.484*	*0.471*	*0.495*	*0.439*	*0.471*	*0.392*	*0.500*	*0.497*	*0.502*
B. Sources	Investing.com			Other Web Financial Newsites			Newspapers		
	All	Males	Females	All	Males	Females	All	Males	Females
Treatment	0.136***	0.159***	0.112***	-0.139***	-0.173***	-0.090***	-0.039**	-0.046	-0.019
	(0.015)	(0.021)	(0.022)	(0.027)	(0.040)	(0.033)	(0.019)	(0.030)	(0.024)
Male	0.007			0.101*			0.076*		
	(0.044)			(0.055)			(0.046)		
R-squared	0.073	0.103	0.089	0.055	0.099	0.064	0.041	0.056	0.074
Mean DV (Control)	*0.0135*	*0.0131*	*0.0139*	*0.259*	*0.359*	*0.153*	*0.108*	*0.144*	*0.0694*
SD	*0.115*	*0.114*	*0.117*	*0.439*	*0.481*	*0.361*	*0.311*	*0.352*	*0.255*
C. Other/None	Other News Sites			Other			No One		
	All	Males	Females	All	Males	Females	All	Males	Females
Treatment	-0.048**	-0.066**	-0.021	-0.009	-0.022	-0.003	0.432***	0.429***	0.423***
	(0.022)	(0.033)	(0.026)	(0.009)	(0.014)	(0.009)	(0.029)	(0.038)	(0.045)
Male	0.055			-0.019			0.080		
	(0.047)			(0.023)			(0.062)		
R-squared	0.022	0.031	0.052	0.036	0.080	0.059	0.197	0.235	0.198
Mean DV (Control)	*0.131*	*0.170*	*0.0903*	*0.0168*	*0.0261*	*0.00694*	*0.185*	*0.163*	*0.208*
SD	*0.338*	*0.377*	*0.288*	*0.129*	*0.160*	*0.0833*	*0.389*	*0.371*	*0.408*
Observations	1,247	658	589	1,247	658	589	1,247	658	589

This table shows the treatment effect on the treated (TOT/ 2SLS) estimate of the probability an individual selected the particular source in each column in response to the question: ``when you made investment decisions in the past, whom did you consult? Please choose all that apply." The question was answered in July, three to four months after the experiment. All regressions include the same set of controls as Table 4, Col 2. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

Table A9: **Effects on Risk Tolerance (All-Ages Sample)**

	Willingness to Take Risks [1-10]			
	All		Males	Females
	(1)	(2)	(3)	(4)
Treatment	0.479***		0.431***	0.605***
	(0.124)		(0.164)	(0.185)
Treatment x Male		0.395**		
		(0.173)		
Treatment x Female		0.579***		
		(0.195)		
Male	0.446	0.558*		
	(0.279)	(0.322)		
p-value ($\chi^{2:}$Treatment [x Male= x Female])		0.497		
R-squared	0.330	0.330	0.336	0.333
Mean Dependent Var (Control Group)	*4.354*	*4.354*	*4.895*	*3.778*
SD	*2.221*	*2.221*	*2.207*	*2.094*
Observations	1,245	1,245	658	587

Notes: This table shows the treatment effect on the treated (TOT) on individuals' answers to the question (from Dohmen et al. 2011): ``Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? [from 0: 'not at all willing to take risks' to 10: 'very willing to take risks'], measured post-treatment. All regressions include the full set of controls as Table 4, Col 2 as a well as a control for the pre-treatment dependent variable. The p-values are from a $\chi 2$ test of equality between the coefficients on the interaction of the treatment with male and the interaction with female. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1

Table A10: **Treatment Intensity: Effects on Detailed Confidence Components**

	Financial Confidence Index			Literacy Score, % Correct			Subjective Knowledge			Willingness to Take Risks			Invest After Experiment		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A. $50 Endowment	0.119***	0.071	0.150**	4.174***	2.134	6.954***	0.017	-0.127	0.098	0.496***	0.390*	0.627***	0.053	0.077	-0.001
	(0.041)	(0.049)	(0.067)	(1.541)	(1.815)	(2.567)	(0.104)	(0.135)	(0.162)	(0.155)	(0.200)	(0.239)	(0.038)	(0.048)	(0.061)
$100 Endowment	0.178***	0.115**	0.275***	5.518***	3.427**	8.866***	0.094	-0.090	0.314**	0.533***	0.528***	0.651***	0.101***	0.081*	0.127**
	(0.039)	(0.048)	(0.066)	(1.463)	(1.725)	(2.532)	(0.099)	(0.129)	(0.157)	(0.150)	(0.192)	(0.228)	(0.037)	(0.047)	(0.058)
R-squared	0.385	0.358	0.378	0.432	0.522	0.364	0.213	0.181	0.229	0.355	0.351	0.366	0.132	0.098	0.145
Prob>p [Equality of Sub-Treatment Coeffs.]	0.111	0.321	0.0512	0.319	0.396	0.427	0.425	0.756	0.165	0.787	0.393	0.917	0.176	0.933	0.0394
B. Four Week Exposure	0.183***	0.150***	0.221***	5.889***	2.672	10.052***	0.103	0.050	0.122	0.715***	0.696***	0.863***	0.065*	0.098**	0.011
	(0.041)	(0.050)	(0.067)	(1.573)	(1.821)	(2.715)	(0.109)	(0.145)	(0.165)	(0.157)	(0.206)	(0.240)	(0.040)	(0.050)	(0.062)
Seven Week Exposure	0.132***	0.064	0.210***	4.333***	2.882*	6.681***	0.033	-0.192	0.258*	0.406***	0.337*	0.507**	0.086**	0.068	0.105*
	(0.039)	(0.047)	(0.064)	(1.441)	(1.725)	(2.413)	(0.097)	(0.124)	(0.153)	(0.148)	(0.191)	(0.227)	(0.036)	(0.046)	(0.056)
R-squared	0.386	0.362	0.375	0.433	0.522	0.366	0.214	0.185	0.228	0.356	0.353	0.367	0.129	0.099	0.134
Prob>p [Equality of Sub-Treatment Coeffs.]	0.165	0.0480	0.855	0.251	0.891	0.165	0.473	0.0562	0.371	0.0261	0.0368	0.125	0.555	0.501	0.112
C. Voucher Treatment	0.153***	0.122**	0.153*	3.657**	2.469	5.047	0.001	-0.080	-0.026	0.730***	0.888***	0.548*	0.060	0.008	0.122
	(0.048)	(0.057)	(0.083)	(1.853)	(2.163)	(3.129)	(0.129)	(0.164)	(0.215)	(0.201)	(0.238)	(0.329)	(0.046)	(0.057)	(0.077)
Stock Treatment	0.149***	0.086*	0.228***	5.204***	2.901*	8.586***	0.072	-0.115	0.261*	0.461***	0.346*	0.660***	0.083**	0.098**	0.060
	(0.037)	(0.045)	(0.060)	(1.387)	(1.652)	(2.329)	(0.093)	(0.123)	(0.143)	(0.139)	(0.184)	(0.209)	(0.034)	(0.044)	(0.052)
R-squared	0.385	0.359	0.377	0.433	0.522	0.367	0.214	0.182	0.234	0.356	0.359	0.366	0.130	0.102	0.135
Prob>p [Equality of Sub-Treat Coeffs.]	0.929	0.481	0.309	0.342	0.817	0.208	0.546	0.817	0.142	0.133	0.00857	0.715	0.582	0.0884	0.370
Mean Dependent Var (Control Group)	-0.001	0.269	-0.291	68.22	75.19	60.71	3.639	4.225	3.008	4.394	4.891	3.858	0.421	0.505	0.333
SD	0.679	0.598	0.643	24.63	22.48	24.73	1.450	1.258	1.381	2.327	2.195	2.356	0.495	0.502	0.474
Observations	1,037	555	482	1,035	555	480	1,033	555	478	1,036	555	481	933	500	433

This table shows the Treatment Effect On the Treated (TOT: 2SLS) estimates of different sub-treatments on the Financial Confidence Z Score, % Literacy Test Correct; an individual's self-assessed financial knowledge, ranging from 1: "Terrible", to 7: "Excellent; self-assessed willingness to take risks [1-10], and an indicator for whether an individual reported having invested in stocks two-three months after the experiment. All outcomes are measured post-experiment. All regressions include the full set of controls from Table 4, Col 2. The p-value is from a chi-squared test of equality of the sub-treatment coefficients. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1.

Table A11: **Treatment Intensity: Effects on Detailed Confidence Components (All Ages Sample)**

	Financial Confidence Index			Literacy Score, % Correct			Subjective Knowledge			Willingness to Take Risks			Invest After Experiment		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A. $50 Endowment	0.097**	0.057	0.132**	4.138***	2.540	6.006**	-0.067	-0.197	0.035	0.485***	0.432**	0.578***	0.031	0.051	-0.005
	(0.038)	(0.047)	(0.061)	(1.404)	(1.615)	(2.391)	(0.097)	(0.127)	(0.149)	(0.143)	(0.183)	(0.218)	(0.035)	(0.045)	(0.055)
$100 Endowment	0.146***	0.065	0.255***	5.659***	3.798**	8.693***	0.008	-0.234*	0.281*	0.474***	0.431**	0.631***	0.075**	0.048	0.105**
	(0.036)	(0.046)	(0.060)	(1.340)	(1.560)	(2.337)	(0.092)	(0.121)	(0.145)	(0.136)	(0.176)	(0.207)	(0.034)	(0.044)	(0.053)
R-squared	0.359	0.335	0.348	0.415	0.499	0.360	0.197	0.172	0.211	0.330	0.336	0.333	0.124	0.084	0.141
Prob>p [Equality of Sub-Treatment Coeffs.]	0.155	0.837	0.0297	0.219	0.357	0.219	0.397	0.744	0.0745	0.930	0.994	0.798	0.178	0.944	0.0400
B. Four Week Exposure	0.160***	0.112**	0.211***	5.880***	2.940*	9.046***	0.060	-0.061	0.173	0.605***	0.609***	0.703***	0.047	0.064	0.015
	(0.038)	(0.049)	(0.061)	(1.436)	(1.616)	(2.471)	(0.103)	(0.138)	(0.153)	(0.148)	(0.195)	(0.224)	(0.037)	(0.048)	(0.057)
Seven Week Exposure	0.103***	0.037	0.185***	4.453***	3.326**	6.384***	-0.072	-0.292**	0.152	0.413***	0.344**	0.547***	0.058*	0.043	0.080
	(0.036)	(0.044)	(0.059)	(1.317)	(1.549)	(2.279)	(0.089)	(0.116)	(0.142)	(0.134)	(0.174)	(0.205)	(0.033)	(0.042)	(0.051)
R-squared	0.360	0.338	0.341	0.416	0.498	0.359	0.199	0.175	0.207	0.331	0.338	0.333	0.123	0.084	0.132
Prob>p [Equality of Sub-Treatment Coeffs.]	0.0998	0.0783	0.646	0.252	0.778	0.229	0.149	0.0536	0.879	0.144	0.104	0.471	0.743	0.616	0.209
C. Voucher Treatment	0.107**	0.068	0.135*	4.525***	3.222*	6.098**	-0.135	-0.262*	-0.066	0.630***	0.749***	0.527*	0.026	-0.006	0.075
	(0.044)	(0.055)	(0.074)	(1.674)	(1.916)	(2.945)	(0.117)	(0.150)	(0.188)	(0.180)	(0.219)	(0.290)	(0.042)	(0.053)	(0.069)
Stock Treatment	0.127***	0.060	0.210***	5.052***	3.193**	7.696***	0.002	-0.204*	0.216	0.439***	0.346**	0.625***	0.062*	0.065	0.051
	(0.034)	(0.043)	(0.055)	(1.264)	(1.481)	(2.153)	(0.086)	(0.115)	(0.133)	(0.127)	(0.168)	(0.190)	(0.032)	(0.041)	(0.049)
R-squared	0.359	0.336	0.342	0.415	0.499	0.359	0.198	0.171	0.212	0.331	0.342	0.333	0.123	0.086	0.132
Prob>p [Equality of Sub-Treat Coeffs.]	0.621	0.865	0.242	0.718	0.986	0.532	0.194	0.665	0.0884	0.229	0.0283	0.715	0.342	0.140	0.698
Mean Dependent Var (Control Group)	0.0273	0.304	-0.267	69.02	76.19	61.41	3.690	4.301	3.042	4.391	4.882	3.868	0.447	0.530	0.360
SD	0.685	0.597	0.651	24.65	21.80	25.29	1.463	1.262	1.384	2.334	2.191	2.375	0.498	0.501	0.482
Observations	1,247	658	589	1,244	658	586	1,242	658	584	1,245	658	587	1,118	588	530

This table shows, for the all-age sample, the Treatment Effect On the Treated (TOT: 2SLS) estimates of different sub-treatments on the Financial Confidence Z Score, % Literacy Test Correct; an individual's self-assessed financial knowledge, ranging from 1: "Terrible", to 7: "Excellent; self-assessed willingness to take risks [1-10], and an indicator for whether an individual reported having invested in stocks two-three months after the experiment. All outcomes are measured post-experiment. All regressions include the full set of controls from Table 4, Col 2. The p-value is from a chi-squared test of equality of the sub-treatment coefficients. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1.

Table A12: **Effects of Price Changes, Volatility and Asset Type on the FCI**

	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Positive Price Change	0.154***	0.109**	0.198***									
	(0.038)	(0.046)	(0.062)									
Negative Price Change	0.142***	0.061	0.254***									
	(0.046)	(0.055)	(0.078)									
% Price Change				0.003	0.006	-0.002						
				(0.004)	(0.004)	(0.006)						
Std. Dev. % Price Chge				0.006	-0.027	0.042						
				(0.020)	(0.024)	(0.032)						
Domestic Assets							0.141***	0.069	0.249***			
							(0.043)	(0.051)	(0.073)			
Foreign Assets							0.155***	0.110**	0.195***			
							(0.038)	(0.047)	(0.062)			
Company Stocks										0.152***	0.094*	0.222***
										(0.040)	(0.049)	(0.066)
Index Funds										0.148***	0.094*	0.205***
										(0.040)	(0.049)	(0.067)
R-squared	0.385	0.359	0.373	0.381	0.355	0.370	0.385	0.360	0.373	0.385	0.358	0.375
Prob>p [Equality of Sub-Treatment Coeffs.]	0.783	0.343	0.431	0.905	0.242	0.234	0.719	0.359	0.408	0.931	0.999	0.791
Mean Dependent Var (Control Group)	-0.00120	0.269	-0.291	-0.00120	0.269	-0.291	-0.00120	0.269	-0.291	-0.00120	0.269	-0.291
SD	0.679	0.598	0.643	0.679	0.598	0.643	0.679	0.598	0.643	0.679	0.598	0.643
Observations	1,037	555	482	1,037	555	482	1,037	555	482	1,037	555	482

This table shows the Treatment Effect On the Treated (TOT: 2SLS) estimates of different sub-treatments on the Financial Confidence Z Score Index. Positive and Negative Price Changes are indicators and % Price Change and its Standard Deviation are continuous variables, all of which are calculated over the duration of each individual's experimental exposure. Domestic Assets, Foreign Assets, Company Stocks and Index Funds are all indicator variables for whether the individual was exposed to that type of asset. All regressions include the full set of controls from Table 4, Col 2. The p-value is from a chi-squared test of equality of the sub-treatment coefficients. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1.

Table A13: **Effects on Understanding the Riskiness of Stocks vs Mutual Funds**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	% Augmented Lit. Score Correct			All Big Three Correct [0/1]			Risk: Stocks vs Funds [Correct?]		
	All	Males	Females	All	Males	Females	All	Males	Females
Exposed to Company Stocks	4.803***	4.599***	5.345**	0.081**	0.077	0.094*	0.100**	0.073	0.139**
	(1.502)	(1.716)	(2.597)	(0.039)	(0.053)	(0.057)	(0.042)	(0.055)	(0.060)
Exposed to Index Funds	4.730***	2.923	6.629**	0.124***	0.122**	0.129**	0.143***	0.108**	0.183***
	(1.586)	(1.812)	(2.779)	(0.040)	(0.054)	(0.060)	(0.043)	(0.054)	(0.066)
R-squared	0.414	0.494	0.365	0.167	0.215	0.153	0.106	0.146	0.123
Prob>p [Equality of Sub-Treat Coeffs.]	0.960	0.271	0.614	0.246	0.353	0.536	0.264	0.458	0.476
Mean Dep. Var. (Control Group)	*66.67*	*74.55*	*58.17*	*0.343*	*0.455*	*0.221*	*0.426*	*0.527*	*0.317*
SD	*23.13*	*20.82*	*22.56*	*0.476*	*0.500*	*0.417*	*0.496*	*0.502*	*0.468*
Observations	929	501	428	929	501	428	929	501	428

This table shows the Treatment Effect On the Treated (TOT: 2SLS) estimates of exposure two sub-treatments-- exposure to company stocks and index funds-- on the % Correct on an augmented financial literacy test which includes the question "True or False: Buying a single company's stock usually provides a safer return than a stock mutual fund" (Cols 1-3). Columns 4-6 show the effect of the sub-treatments on the "Big Three" financial literacy questions, which test Numeracy, Compounding and the Riskiness of Stocks vs Mutual Funds. Columns 7-9 estimate the effect on the correct responses to the latter question only. All outcomes are measured in the July 2015 follow-up survey. All regressions include the same set of controls as Table 4, Col 2. The p-value is from a chi-squared test of equality of the sub-treatment coefficients. Robust standard errors in parentheses, significant at *** p<0.01, ** p<0.05, * p<0.1.