

## Trust, Financial literacy and Financial Market Participation

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### Abstract

We consider the roles of trust and financial literacy in engaging with financial markets – both the number of ways in which people engage and their individual preferences for how to engage. We find that both trust and financial literacy are strongly related to financial market participation but that the two channels work differently. Trust is more uniformly related to increases in financial market participation, with only the rate of increase changing over the scale. In contrast and in line with the old saw “a little knowledge can be a dangerous thing,” we find that increases in financial literacy from low-to-mid levels are associated with an initial decline in financial market participation but that subsequently an increasingly positive relationship emerges. Our findings suggest that trust and financial literacy play different roles, but each is related to investment behaviors in important ways.

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## 1.0 Introduction

This paper considers the role of two key factors, trust and financial literacy, in financial engagement. Scholars continue to research and debate the factors that affect financial market participation. With a growing reliance in the United States on voluntary self-directed retirement savings, the capacity and willingness of individual Americans to save and invest appropriately has taken on an important policy dimension. Some studies have raised concerns that Americans save and invest too little for retirement (Gillers, et al. 2018), while others suggest that Americans are roughly on track (Scholz, Seshadri and Khitatram, 2006; Brady, 2016). Regardless of where one comes down on this issue, a better understanding of the factors that contribute to promoting saving and investment can inform both public policy and private sector practice.

Intuitively, use of financial products and services implies trust in markets, trust in counterparties, and trust in the suitability of investments being sold. This is no less true over long horizon lifecycle saving and in connection with investment objectives such as saving for retirement. Studies show that levels of trust are correlated with willingness to invest (Sapienza and Zingales 2012). And, generally it can be argued that a society's level of trust is an important driver of economic activity (Evans and Krueger, 2009; Hilsenrath, 2013).

At the same time, an extensive literature documents widespread financial illiteracy and correlated failures in saving and investing (Lusardi, 2004; Lusardi Mitchel and Curto, 2010; Lusardi and Mitchell, 2014). Saving and investing are difficult tasks that involve complex financial products (Marte 2017). Financial literacy may enhance the ability of individuals to engage in these tasks and manage investments. Financial literacy may also help investors to monitor intermediaries' use of financial products and to ensure that this use is consistent with their investment goals. In this way, financial literacy may increase willingness to invest in financial markets, whether independently or through an intermediary.

If both trust and financial literacy each play a role in facilitating investment, as the literature finds, a natural further question is whether there is a relationship between the two. By working with both attributes, we are able to offer some perspective on whether and how the two

attributes relate to each other. This is important for two reasons. If financial literacy is correlated with trust, they are likely to complement each other, encouraging financial market participation, and enabling investors to engage effectively. If, however, trusting investors lack financial literacy, they may be particularly vulnerable to poor financial advice or even fraud.

Our data consist of survey results from a cross section of Amazon Mechanical Turk (MTurk) workers. We constructed our survey to explore trust, financial literacy and attitudes regarding investing. We explore both existing and new measures of trust. We employ these measures to examine the relationship between trust and financial market participation. We also refine a measure of financial literacy, working from a battery of previously proven financial literacy questions. We explore the relationship between all three attributes and individuals' participation in investment markets.

We first observe that both trust and financial literacy have highly non-linear impacts. We also find that they work differently. Increases in trust are consistently correlated with increases in financial market participation. By contrast, and in line with the old saw, "*a little knowledge can be a dangerous thing*," we find that increases in financial literacy from low to middle levels are associated with declines in average levels of financial market participation. From middle to high levels of financial literacy, rates of financial market participation increase strongly.

We further explore preferences for types of financial market participation. We find that trust is associated with an increased preference for financial advice, and, specifically, a preference for human advice rather than algorithmic (robo) advice. We observe higher levels of financial literacy among those who prefer to work more autonomously and less through any type of intermediary. Regression analysis indicates that, although both trust and financial literacy contribute to market participation, trust is more fundamental.

Exploring the relationship between our variables of interest and various subject demographics, we identify age as positively related to all three major elements in our study: trust, financial literacy, and financial market participation. Controlling for age, we find that both trust and financial literacy are positively related to financial market participation. Our findings are

consistent with work finding that younger subjects may rationally limit their investments in financial literacy (Lusardi, Mitchell and Curto, 2010). Focusing on a high-education sample, Richardson, Seligman and Davis (forthcoming), find evidence that students with relatively long planning horizons facing scarce time budgets invest in more urgent and more productive income enhancing activities, leaving financial education for a later period when, presumably, they will have more income and wealth.

## **2.0 Literature Summary**

Our work builds upon research into the role of both trust and financial literacy in investment decision-making.

### *2.1 Understanding and Measuring Trust*

One challenge for research seeking to understand the role of trust is the range of methodologies that have been used to assess trust. One of the most common measures is the generalized trust question contained in the World Values Survey (WVS) that asks subjects “Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?” (Banerjee 2018).<sup>1</sup> An extensive literature uses this question, particularly for purposes of cross-country comparisons. (E.g. Georgarakos and Inderst, 2014). Notably several studies have used the WVS question to identify a correlation between trust and stock market participation (for example in: Guiso, Sapienza, and Zingales, 2008; and Georgarakos and Pasini, 2011). These studies do not, however, explore the role of inter-personal variations in levels of trust.

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<sup>1</sup> The World Values Survey is a questionnaire that has been fielded since 1981 to collect information about a variety of cultural values, attitudes and beliefs around the world. The most recent questionnaire consists of 290 questions. See <http://www.worldvaluessurvey.org/WVSContents.jsp?CMSID=QuestDevelopment>.

The question from the World Values Survey (WVS) is based on a similar question from the General Social Survey (GSS) which has been fielded in the United States since 1972 and was most recently fielded in 2016.<sup>2</sup> The survey data from this question reveals a meaningful erosion in trust.<sup>3</sup> The percentage of respondents reporting a general distrust, has increased from half (50 percent) in 1972 to nearly two-thirds (64 percent) in 2016 (Figure 1). This downward trend causes our finding that trust is positively correlated with financial market participation, to be of concern.

[Figure 1 here]

The Trust Game, which is based on the work of Berg, Dickhaut and McCabe (1995) , is another common tool for measuring trust. This work has spawned an entire class of experiments with a similar methodology in which subjects pass money to unknown partners and may or may not receive a financial benefit from doing so. We refer to these experiments as BDM-type games. Brulhart and Usunier (2012) document that BDM-type games all follow similar patterns and interpret the amount passed by the first mover as a measure of trust and the amount passed by the second mover as a measure of trustworthiness. Other scholars however have questioned the effectiveness of BDM games in measuring trust. Bicchieri et al. (2011) conclude that the game measures a norm of reciprocity and claim that there is no independent norm of trust.

Our own exploratory work with a BDM-type game found consistent patterns in the behavior of first and second movers that seemed to signal that players had varying types of norms about sharing, reciprocity and punishment. We also found evidence that participants adjusted their behavior to perceived signals about the norms associated with the game. We did not, however, observe any distinguishable relationship between game play and financial literacy or use of financial products.<sup>4</sup>

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<sup>2</sup> See: <https://gssdataexplorer.norc.umd.edu/variables/441/vshow> for survey data from this question.

<sup>3</sup> Id.

<sup>4</sup> Regarding the traditional trust measure, giving in the first round of the game (from \$0 to \$5), financial literacy stays in a narrow range of +6 to -8 percent of the sample average, with no consistent up-or-down pattern as

Scholars have also distinguished between generalized trust and trust in institutions such as banks, Wall Street, or the government. The most extensive work in this area has been done by Sapienza and Zingales who report levels of trust of a variety of people and institutions based on an annual survey conducted since 2008. For example, Guiso, Sapienza, and Luigi Zingales (2008) look at trust in institutions; and Sapienza and Zingales (2012) consider trust in individuals versus trust in banks. Asgharian, Liu, and Lundtofte (2017) contrast trust as measured by the WVS and a component of trust that is related to institutional quality.

Other research identifies alternative approaches to measuring trust. Frazier, Johnson and Fainshmidt (2013) survey the literature on the measurement of trust and construct a propensity-to-trust scale building from work in Mayer and Davis, 1999; Lee and Truban, 2001; McKnight et al., 2002; Huff and Kelly, 2003; and Goldberg et al., 2006. They employ factor analysis of previous authors' questions, which are somewhat proximate to the WVS and GSS questions in that they are relatively broad and generic.<sup>5</sup>

We note that many survey questions used to measure trust are abstract, which is to say that they do not distinguish professional or transactional context when measuring trust. This level of abstraction in trust-related survey research is consistent with long used measures from the GSS

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players increase in "trust" (generosity). Variation about the mean use of financial products is greater (+49 to -19 percent), however, use patterns are similarly trend-free.

In a regression setting, the BDM-type measure suffers further from a strong bimodal response pattern whereby nearly one quarter (23 percent) of the sample give nothing, and nearly half (45 percent) give all they can. Despite the extreme difference in responses in the trust game, these two polarized groups of responses are very similar in terms of financial literacy, on average scoring seven out of 10 – roughly average. Both groups also hold less than two equities accounts, again similar to the overall average. Because of weak results with the trust game in work with a sample of 488, we dropped the trust game from later survey rounds (see section 3 for more on data collection methods).

<sup>5</sup> Specifically, the four questions they find to have the most salience are:

- i- *I usually trust people until they give me a reason not to trust them.*
- ii- *Trusting another person is not difficult for me.*
- iii- *My typical approach is to trust new acquaintances until they prove I should not trust them.*
- iv- *My tendency to trust others is high.*

critiqued in Glaeser et al., 2000.<sup>6</sup> These authors point out that abstract measures may be good for measuring macro- or state-level differences but may fail to identify transaction-relevant cues which vary from person to person and even from context to context, for the same person.

Our work is also motivated by recent studies of the impact of mistrust on financial market participation. Giannetti and Wang (2016) find that revelations of corporate fraud are followed by reductions in households' use of equity markets. The work of Vohs, Baumeister, and Chin (2007) investigates mistrust more abstractly, specifically fears of exploitation and related mistrust. They find mistrust to be increasing in a person's perception that another can take advantage of them – in short, that it is related to a sense of vulnerability. We posit that this sort of mistrust, whether or not it is justified, may lead to lower levels of financial market participation, or a greater inclination towards self-managed finances. An interesting related question is whether mistrust might be related to increased financial literacy, in that it might motivate individuals to seek to increase their financial literacy to reduce their potential vulnerability.

We pioneer a more expansive evaluation of trust using both the standard measures and a variety of contextual questions that explore trust in situations, trust in institutions and assessment of people in specific contexts. Through early rounds of field work, we explored the correlation among these measures and developed a multi-dimensional measure of for trust-in-people. We find that the multidimensional scale for our trust-in-people measure performs similarly to the GSS and WVS measures. An advantage of our measure is that it affords greater contextual depth for relating trust to financial market participation, addressing the critique in Glaeser et al., 2000.

Studies have also sought to identify the demographic factors that contribute to varying levels of trust. Among these factors, a number of studies show race to be an important determinant of trust (Smith 2010). Age has been found to have a strong, positive, nonlinear correlation with trust, and people with more education have been documented as being more trusting (Uslaner

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<sup>6</sup> Also see Figure 1 and footnote 2, earlier in this paper.

2002). In line with these findings we collect and control for age, race and educational level, as well as other demographic variables.

## 2.2 *Trust and Financial Market Participation,*

A variety of scholars, most prominently Sapienza and Zingales, have studied levels of trust in Wall Street and financial institutions as well as the relationship between trust and investing. Guiso, Sapienza and Zingales (2013) find that “trust has a positive and large effect on stock market participation as well as on the share invested in stocks.” Haman (2015) explores levels of institutional and individual trust across 15 countries and concludes that trust explains differences in levels of stock market participation. Asgharian, Liu, and Lundtofte (2017) consider institutional trust more broadly and, in cross-country work, find that “the part of trust related to institutional quality is particularly relevant to stock-market participation and that the effect of related trust on stock-market participation cannot be captured by other country-level variables.”

Gennaioli, Shleifer and Vishny (2015) provide a theoretical framework for the relationship between trust and investing. Their model predicts that trust reduces investor anxiety, and the authors conclude that investors may be willing to accept higher fees and lower performance in order to reduce that anxiety. The work of Sun et al (2016) similarly finds that investors are more willing to follow the advice of financial advisors whom they trust, even when those advisors charge higher fees. Germann, Loos, and Weber (2018) also study the role of trust in investing. They utilize a BDM-type game to measure trust and trustworthiness and again find that investors take greater risk when investing through trustworthy money managers and are willing to pay more to do so. The work in these three papers differs in one important way from our own they take financial market participation as given. In our work, financial market participation is not a given.

On the importance of financial market participation, Seligman and Bose (2012) find that participation in workplace financial literacy seminars, combined with some degree of active

portfolio selection in a defined contribution plan lead to increased financial market activity outside of the workplace and increased household wealth at retirement. Fichtner and Seligman (2018) find that active participation in the equities market was an important predictor of wealth preservation for retired households over the 2008 – 2014 period. These papers suggest that helping households become comfortable making portfolio decisions in equity markets is important for building and preserving household wealth over both work and retirement years. However, neither of these papers considers the role of trust in facilitating financial market participation. In a series of articles based on surveys of US households, Holden et al (2018, 2019) relate trust to financial market participation, finding that high frequency investment through defined contribution plans reduces individuals' worry with the short-term performance of their investments.

### 2.3 *Financial literacy, Financial market participation, and Trust*

Several studies of financial literacy in the American population (including Lusardi 2008, Lusardi and Mitchell 2007, 2014; Lusardi, Mitchell, and Curto 2010; Hilgert, Hogarth, and Beverly 2003) have concluded both that: (1), levels of financial literacy are low in the American population and (2), that these levels should be improved. Research also explores the relationship between financial literacy and wealth. For example, Van Rooij, Lusardi, and Alessie (2012) document a positive relationship between financial literacy and wealth.

Lusardi and Mitchell's work since the turn of the century has developed three key financial literacy questions on compounding, inflation, and the impact of diversification on risk. While some scholars have observed that these measures are "quite crude." (Ricci & Carratelli 2017), the questions are used quite broadly in research. That these questions are relatively simple may be seen as a virtue.<sup>7</sup> Indeed, the ubiquity of these measures in studies analyzing financial

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<sup>7</sup> "Crudeness" may be a positive attribute of the questions. To the extent the "Big Three" are relatively easy, they set a low bar for success; by this logic, it follows that failure to answer the questions correctly is more concerning than getting a more difficult question wrong.

literacy supports their use. None of this is to say that other measures incorporating more advanced questions are not valuable, however.

Because our work interrogates the relationship between trust and financial literacy, we build upon prior research exploring financial literacy as well as other more detailed studies. (Knoll and Houts (2012), Schmeiser and Seligman (2013), Lusardi, Mitchell and Curto (2014), Fisch, Wilkinson-Ryan, and Firth (2016)). We use this work to construct and field test a ten-question measure, as described further in Section 3.

Very few other studies have looked at both trust and financial literacy. Agnew et al. (2012) explore the relationship between trust and plan knowledge in 401(k) plan participation using telephone survey data of 817 401(k) plan members and a single question measuring trust in financial institutions.<sup>8</sup> They find that plan knowledge is related to voluntary enrollment in 401(k) plans. Turning to participants who are automatically enrolled, they find trust and understanding the employer's policy for matching employee contributions are related to participation (in this case staying in the plan). Similarly, Georgarakos and Inderst (2014) find that household use of financial advice is related to both trust and financial capability.

Balloch, Nicolae and Phillip (2015) use data from the American Life Panel and find that "stock market literacy" is most important for participation in equity markets, while trust (sociability) further helps explain the level of market participation, in equities.<sup>9</sup> We build upon this study's methodology in constructing our measure of financial market participation, through an approach that we explain in section 3.<sup>10</sup>

Ricci and Caratelli (2017) use the Bank of Italy's Survey on Household Income and Wealth data to explore the relationship between trust, financial literacy, and retirement planning. These authors find financial literacy and a proxy for trust are positively related to decisions to

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<sup>8</sup> The trust question used measures the degree of agreement with the statement, "*For the most part, financial institutions are trustworthy.*"

<sup>9</sup> They write, "households that trust the stock market have a lower threshold level for the proportion of stock market investment below which participation is not worthwhile and hence participate more in the stock market."

<sup>10</sup> We do not ask respondents to reveal their wealth or what proportion of it is invested in financial markets.

participate in voluntary pensions and to move deferred compensation balances to these pension accounts.

Notably, Ricci and Caratelli (2017) express concerns with the endogeneity of reports of trust and financial literacy. As a result, they use a regional indicator of social capital as a proxy for trust rather than relying on individual survey responses. Given the limits of their proxy, they end by suggesting work with more targeted survey questionnaires.<sup>11</sup> Our methodology responds directly to this invitation. Using a targeted questionnaire, we find that general levels of trust-in-people and financial literacy are not related to each other.<sup>12</sup> When we look at trust in financial advisors specifically, we find a mild decline in trust of financial advisors as financial literacy increases (Figure 2). This may be related to the idea of mistrust described earlier in Vohs, Baumeister and Chin (2007). However, the variation we observe is mild and it is bounded within the positive region of trust.

[Figure 2: Patterns of Trust and Financial literacy]

### 3.0 Data Collection Methods and Survey Design

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<sup>11</sup> Specifically, they write, “The main limitation of this work is related to the use of secondary data ... The impact of trust undoubtedly deserves further investigation, possibly using /ad hoc/ questionnaires to collect more information on individual choices...”

<sup>12</sup> We find that average reported levels of trust across the spectrum of type of people we enquire about, hovers just above a neutral level of “3” at 3.07, regardless of level of financial literacy. We find the range of trust values that are reported is very narrow, across financial literacy scores ranging from an average of 2.95 to 3.36 for those with a much broader range of financial literacy scores. We further find that the standard deviation in reported levels of trust by score also sit in a very narrow range from 0.53 to 0.79. Finally, there is no discernable pattern to variation in the mean level of trust-in-people by financial literacy score. Neither the mean level of trust, nor variation in the level of trust increase increase, decrease, or have any parabolic relationship with financial literacy in our survey sample.

Data collection and survey development occurred over three distinct field research periods. In an initial period in late 2017, we developed and fielded an independent financial literacy survey. The second survey period occurred over the spring of 2018. Over this period, we integrated the selected financial literacy questions with a large selection of questions targeting trust. Data were collected in several weekly bursts, which afforded the opportunity to validate the survey mechanics. Towards the end of this period, we engaged in power analysis estimation exercises to begin to decide a stopping point for field research.<sup>13</sup> Subsequently we entered data collection phase three which collected an additional 312 observations to add to the spring collection of 550. With subsequent adjustments, effective sample sizes used in analysis are consistently over 700, which meets work objectives.

### 3.1 *Data Collection Methods*

Our data collection environment consists of a survey developed and presented in the Qualtrics survey design tool. Our sample was engaged, surveyed, quality checked, and paid using the Mechanical Turk (MTurk) survey collection tool, including associated user-contributed scripts. We limited participation to MTurk Expert Workers (the label “Expert” is conferred by Amazon). Our scripting within the MTurk environment ensured wsurvey respondents were limited to a single response,<sup>14</sup> that they were paid relatively well (\$2.50 per completed survey), and in a timely manner (within 7 days). We also incorporated an attention check question to determine whether respondents read the survey carefully, before answering questions.<sup>15</sup>

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<sup>13</sup> Power analysis describes work to discern the minimum sample sizes required to discern the percent deviation at which a sample is capable of rejecting a null hypothesis, or a set of related nulls. The UCLA Institute for Digital Research and Education provides a useful introduction to the subject. <https://stats.idre.ucla.edu/other/mult-pkg/seminars/intro-power/> See Appendix 2 for more on our work for this project.

<sup>14</sup> See Ott, 2018.

<sup>15</sup> Respondents that failed the attention check were stopped mid-survey, their responses were discarded, and they were not paid.

### 3.2 *Survey Development*

We handled question development in phases. Beginning with financial literacy questions, we drew upon prior research including Fisch, Wilkinson-Ryan and Firth (2016); Lusardi, Mitchell and Curto (2014); Schmeiser and Seligman (2013); and Knoll and Houts (2012) to construct an initial set of 30 financial literacy questions. These were fielded and questions that were redundant (high correlation with another question), or ineffective (low correlation with overall score) or found to be off-topic were eliminated. This method generated a core battery of 10 questions for our financial literacy scale measure.<sup>16</sup>

We also relied on recent work by the Consumer Financial Protection Bureau (CFPB) which has developed questions targeting financial wellbeing.<sup>17</sup> We incorporated two of these new complementary, psychometrically validated measures. The first is an emotive measure which speaks to money concerns, the second is a more direct measure of income adequacy.<sup>18</sup>

In the next phase, we surveyed the literature to develop a battery of trust questions, which we fielded informally, and then increasingly formally. We developed four types of questions as follows: questions about trust in specific types of people {persons like yourself, financial advisors, reporters, government officials, employers, CEOs, doctors, and car salesmen}; a four item measure of trust in the financial sector; a series of context-specific trust questions (e.g.: airports, elections, tax reporting), and a three-item series from the established BDM-type trust game.

Our measure of financial market participation expands upon the work of Balloch, Nicolae and Phillip (2015). We provide subjects with a list of types of financial accounts and measure financial market participation by the number of types that they report to have. Our list includes

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<sup>16</sup> See questions F1 – F10 in the survey included as an appendix to this paper.

<sup>17</sup> The CFPB recently underwent a name change to become the Bureau of Consumer Financial Protection (BCFP). For more detail on financial wellbeing measures see: <https://www.consumerfinance.gov/data-research/research-reports/financial-wellbeing-scale/>

<sup>18</sup> See questions CFPB1 and CFPB2 in the survey included as an appendix to this paper.

employer sponsored retirement accounts, brokerage accounts and a few others.<sup>19</sup> Our measure, like others may have some drawbacks, including our inability to verify the reported data as well as potential investor confusion about the categories of accounts.

We find a non-linearity in account use which is important to keep in mind for work in regression settings. The data suggest those with a very large number of accounts may be more naive and less engaged than their counterparts. Consistent with this idea, those who hold the maximum number of accounts we can count, seven, have the highest overall trust-in-people scores and lowest financial literacy scores of any group, including those holding no accounts.<sup>20</sup> That noted, we have no view as to the ideal number of accounts a person should hold.

In phase two, we formally field the survey, including questions related to a BDM-type trust game. Analysis at the end of phase two included univariate, bivariate, and preliminary regression analysis, along with the power analysis mentioned earlier. These efforts suggested that the research would benefit from a greater number of observations and that the BDM-type trust responses were not informative (see footnote four for more detail). Ahead of phase three, we added the WVS / GSS general trust question to our survey, to test the comparability of our constructed composite of various person-trust measures with the broader and more generic question. By the end of phase two, although certain trust questions yielded answers that made sense on their own, preliminary work suggested they were not strongly correlated with financial literacy or financial market participation.<sup>21</sup> These variables were generally left in the

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<sup>19</sup> See appendix, question D6, for the full list of assets and financial products we ask about.

<sup>20</sup> Regarding trust: those holding the maximum number of accounts consistently offer trust ratings among the highest across all types of other people and are the only group to offer a better than neutral trust score for car sales types.

Regarding financial literacy: those with the maximum number of accounts average financial literacy scores under 50 percent, while the others we survey average over 70 percent. Those holding no accounts have the second lowest financial literacy scores and the lowest trust scores in our group. Scores of 70 percent or above are observed for those holding between two and six accounts.

<sup>21</sup> For example, respondents tended to respond that they trust bomb-sniffing dogs in airports but were not willing to trust their bag to a stranger in order to use the airport restroom. As well respondents were more likely to have faith in Democracy in the United States than in Russia. While the results make sense, they do not have anything to do with measures of interest in this paper.

phase three survey, though in the end they were of little use. The final survey instrument is presented as an appendix for the interested reader.

Along with data related to our research we obtain socio-economic data as controls. Our respondents report a broader range of income, age, political, and educational backgrounds than is typically found in academic sample studies targeting trust in social and principal-agent contexts.<sup>22</sup>

## 4.0 Analysis and Findings

### 4.1 *Basic Patterns in the Survey Data*

Our sample, which combines phases 2 and 3 data includes over 700 complete surveys. Table 3 offers summary statistics for our regression sample. It also compares the composite trust-in-people variable with a WVS / GSS type trust question,<sup>23</sup> a comparison that is only available for the relatively smaller number of subjects in phase 3. In fact, we find that the two measures have roughly identical means that are both just slightly above a neutral (neither trust nor distrust) reading. The composite person-type measure has lower standard deviation.<sup>24</sup>

[Table 1: Summary Statistics for The Regression Sample and Related Samples]

While the composite trust-in-people measure performed very well, trust varied meaningfully across archetypes, for example a paired t-test strongly rejects the idea that trust responses for

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<sup>22</sup> For example, Brulhart and Usunier (2012) use a sample of students from the University of Lausanne. Glaeser, Laibson, Scheinkman and Souttern (2000) engage a sample of first year students from a single introductory course at Harvard University.

<sup>23</sup> question T0b in the survey – see appendix

<sup>24</sup> A paired sample t-test (run in Stata) confirms the strong similarity in these two measures. The test resoundingly fails to reject the hypothesis that they are equal and in particular that the composite person measure yields a more trusting report than the WVS/GSS question type.

doctors and car sales people are equivalent. Similarly, financial advisors are significantly distinguished from other person types by way of t-test comparisons. The only exceptions to the very discrete responses by person-type are between (1) doctors and persons-like-yourself and, (2) to a lesser extent, between CEOs and government officials.<sup>25</sup>

Moving next to aspects of trust in Wall Street and financial advisors, we take care to place some of our questions in a reversed (negative) frame, to control for any agreeability bias.<sup>26</sup> When we build a composite of these measures, which is increasing in trust, we find that the sample averages a better than neutral sentiment overall. The overall sentiment level is very consistent with that for Financial Advisors, when measured as a type of person (3.31 as compared to 3.38).

We find a very clear positive correlation between reports of trust in the financial advisor person-type and in answers for our four-question battery on financial sector trust. This acts to cross validate both measures and lends credibility to our sample's ability to report attitudes consistently in very different frames and contexts.<sup>27</sup>

The results of our test of financial literacy are roughly in line with those reported in other studies, averaging below a grade of 70 percent. Standard deviations suggest a good amount of variation in scores across the sample, which is also roughly consistent with other survey results.

Table 2 compares results of our financial literacy questions with prior work that sampled both an MTurk survey group and group of Financial Industry Regulatory Authority (FINRA) registered

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<sup>25</sup> This result by itself may be of interest to some readers, the idea of variation in trustworthiness by profession would appear to build in other characteristics such as income incentives, institutional/ethical capital and even perhaps attributes of education and career training.

<sup>26</sup> Looking at the overall battery of T11, T12, T13 and T15, in the survey (see appendix), the interested reader will notice that T11 and T13 are framed to be negative statements while T12 and T15 are scaled so that higher valued reports disagree with positive statements. A potential framing bias in questions may be described for the reader using two questions: [T12- Financial advisors help clients successfully invest in complex financial products] and [T13- Financial advisors offer complex products in order to justify charging high fees]. Average scores for T12, which emphasizes value-added by advisors, are nearly dead-on "Somewhat Agree." By comparison, the average for T13 which asks about a potentially concerning business practice, is closer to neutral but remains shaded towards agreement with the negatively framed statement.

<sup>27</sup> Specifically, as trust in financial advisors increases from 1 – 5, the composite measure for the financial sector increases monotonically from 2.6 to 3.6. The average report for the composite is 3.5 among the 335 respondents offering the modal response for trust in financial advisors, 4, "tend to trust them."

professional advisors.<sup>28</sup> Where comparable, respondents to our survey generally score somewhere between the prior MTurk and FINRA populations with few exceptions.

[Table 2: Comparison of Financial literacy Question Responses Across Three Samples]

The bivariate relationships between financial literacy and our three dependent variable measures are shown in Figure 3. Those with lower scores on the test have fewer types of accounts on average and there is a great deal of variation in the amount of financial market participation among them. As scores increase, initially, both the average number of types of accounts and variation for the population with that score decline. Finally, as scores move above seven (roughly the sample average), the number of types of accounts held increases and variation in that number continues to decline.

The bivariate relationship between financial literacy and delegation is much more straightforward. Increases in financial literacy are correlated with higher preferences for autonomy in decision making. Conditional on seeking advice, preferences for working with a human advisor rise and then fall, mildly, as financial literacy improves.

[Figure 3: Financial literacy in the Context of Three Dependent Variables]

Wellbeing is measured through reports on end of the month cash and concerns of depleting savings using questions from the CFPB survey.<sup>29</sup> On average, the sample reports having money at the end of the month between ‘sometimes’ and ‘often,’ and reports average concerns between ‘very concerned’ and ‘somewhat concerned’ that money saved will not last. Variation in response here is higher than, for example, levels of trust across different types of people. Other characteristics of the sample related to financial wellbeing include use of checking accounts, and defined benefit (DB) pensions that pay consistent flows of income or services in retirement. Eighty-eight percent of the sample have experience with a checking account, just

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<sup>28</sup> Results from that effort are reproduced here with permission from Fisch, Wilkinson-Ryan and Firth, 2016.

<sup>29</sup> See questions CFPB1 and CFPB2 in the survey included as an appendix.

under half with home ownership, and roughly one in five has participated in a defined benefit pension plan.

The average level of education in the sample is between an associate and a four-year postsecondary degree. The average is skewed a bit low, as demonstrated by the fact that 55 percent have graduated from college. Eleven percent have a masters or more advanced degree. The average age of a respondent is roughly in the mid to late 30s but again skews low, suggesting that some respondents may not be done with their education. Figure 4 illustrates the upward trends in financial literacy, trust, and market participation, across age groups. While trust appears to continue to increase in the oldest segment of our sample, the same cannot be said for financial literacy or the number of accounts with which one can trade in equities. The mild declines in financial literacy scores for the oldest members of our sample are consistent with the work of Agarwal, et al. 2009, which document a mild decline in mental function beginning roughly in the mid-fifties or thereabouts.

The decline in the number of types of accounts for those age 66 and older may simply be due to consolidation around the time of retirement. Respondents in this age group are observed to be much more likely to hold IRA, DB and DC account types, and less likely to hold college savings and brokerage type accounts in these data.

[Figure 4: Financial literacy, Trust and Market participation, by Age Group]

The average reported income is roughly two-thirds through the \$50,000-75,000 income group. The remaining variables function mainly as controls.

## 4.2 Regression Results

Regressions focus on financial market participation and consider correlations with trust and financial literacy. To this end, regressions target three related dependent variables. We first explore the *amount of financial market participation*. In two subsequent tables, we then explore the *manner of market participation*, by first assessing the preferred degree of

delegation in portfolio allocation decisions and additionally, preferences for working with a human advisor as opposed to a robo-advisor.

Beginning with a look at factors related to market participation, the pattern of account holding in these data is skewed in a manner that suggests work with a Negative Binomial or a Poisson regression model. Figure 5 illustrates the distribution of this dependent variable. Given the high number of zeros and, considering age as a form of exposure (see Figure 4), the Poisson Regression model is chosen for presented results.<sup>30</sup>

[Figure 5: Sample Distribution of Financial Market Participation]

Working with the number of account types, our composite measure of trust across all types of people is consistently positively related with increases in account-type holdings. When we separate out types of people, CEO and car sales person are identified as weakly more significant than other types. A look at the summary statistics confirms that these two types are associated with some of the lowest levels of trust, which is consistent with the idea that broad trust is again important for market participation. Incidentally, the lack of statistical significance and low magnitude of coefficient significance for the government official here and in other regressions, is consistent with a lack of relationship with several other political participation variables that were collected.<sup>31</sup>

Turning next to elements of trust in the financial sector, the relationship appears to be opposite of that for trust-in-people. People with more positive sentiments towards Wall Street and financial advisors hold fewer types of accounts. Once the composite score is deconstructed, the result appears driven by disagreement with the survey question, “financial advisors offer

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<sup>30</sup> Early work with a two-sided Tobit [0,7] documents 159 lower limit and 16 upper limit censored observations. This further emphasizes the zero account observations as an important part of the distribution. The Tobit model yielded results that were similar in direction and statistical significance, though magnitudes on coefficients were higher. Work with a Negative Binomial model further helped get a sense of sensitivity of results to regression model. Again, patterns of results were not dissimilar, though the relative values of coefficients changed a bit. Regarding the Poisson model, as is common in work with survey data, we employ a robust estimation procedure. Reassuringly, results do not change meaningfully based on this choice.

<sup>31</sup> See footnote 21.

complex products to justify high fees.” Increases in disagreement are negatively related to the number of accounts, though the coefficient is quite small.<sup>32</sup> In partial contrast, agreement with the idea that robo-advisors are better than humans is associated with an increase in the number of types of accounts. Here the estimated magnitudes are a bit larger. This finding is consistent with the idea that robo-platforms simply make it easier to manage a variety of account types.

Given the curvilinear relationship between financial literacy and market participation shown in Figure 3, we include a squared term in our regression specification. We find that a four-point improvement in literacy score is associated with about a one-account decline, while the square term works in the opposite direction at a rate a bit less than 1/10<sup>th</sup> as large. For lower levels of financial literacy, the linear term dominates, while for higher levels the positive squared term is increasingly relevant. This is consistent with the shape of the relationship seen in Figure 3. Both terms are statistically significant at the 99 percent confidence level.

Both included measures of financial wellbeing are positively related with increased financial market participation. The first, signaling the likelihood of having money at the end of the month is statistically significant and points to a role for budgeting being important for financial participation.

Other measures of financial product participation, checking, housing, and DB pension participation are all strongly positively related to our market participation measure, with the result for home ownership being the strongest among these. Education is also correlated with improved financial market participation, albeit with attenuation. The negative coefficient for advanced degrees, and the related result when a squared term is substituted for the binary variables for more advanced degrees, are both consistent with an attenuation dynamic. As with the financial sector result, observed attenuation does not mean that people with higher

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<sup>32</sup> A four-point improvement from strongly agree to strongly disagree, is estimated to lower the number of type of accounts by roughly one quarter of an account type.

degrees have fewer assets, they may simply consolidate accounts across fewer types of accounts, either independently or with professional help.

Other demographic controls show that being white or female is associated with holding slightly fewer accounts on average. Being married or reporting a (partial) retirement is associated with holding a slightly greater number, on average, though these results are statistically a bit more tenuous.

[Table 3: Number of account types in which one can purchase equities (as a measure of market engagement)]

The second regression table, Table 4, focuses on the degree of preference for delegating decision making versus autonomy.<sup>33</sup>

Considering preferences for delegation versus autonomy in decision making, we find that increasing trust in “a person like yourself” is correlated with preferences for greater autonomy, whereas increases in trust for other types are more correlated with increased preference to delegate investment decisions. The most important people to trust, in terms of explaining a preference to delegate, are financial advisors and employers. These results are consistent with the institutional landscape as both advisors and employers help steward investment decisions for many households. (In the case of employers this takes place through their decisions related to default investments and investment choices in defined contribution plans.) Thus, these results suggest that people do employ trust and judgement when delegating financial decision-making tasks between themselves and others.

Similarly, results regarding aspects of financial markets and advisors indicate that more positive sentiments are related with more affinity for delegation. In particular, agreement with the idea

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<sup>33</sup> The dependent variables in both Tables 4 and 5 rely on a degree of preference scale, for which preference intensity can vary along the scale (i.e. the meaning of moving from one to two on the scale may be quite different than moving from three to four). To contend with these dependent variable characteristics, we employ Ordered Probit regression. In each case we report marginal step coefficients for the dependent variable along with other standard correlation results.

that financial advisors help clients contend with complex products is positively related to affinity for delegation.

We also find that, after controlling for other relationships in the data, increases in financial literacy are correlated with increased preference for autonomy. This confirms the bivariate pattern seen in Figure 3.

Delegating to a robo-advisor is correlated with an increased preference for delegating decision making. Increased concern that money saved will run out is weakly associated with a more autonomous hands-on approach. Home ownership and marriage also relate to increases in preferences for autonomy. Retirement is related to increased preference for delegation. Because wealth tends to increase over the lifecycle, the result for retirement may be consistent with wealth leading to an increased appetite for purchasing services, but the coefficients and statistical strength of most of these findings are not strong, and they are best considered simply as controls in this setting. Finally, the bottom panel lends strong support for our choice of regression model, as step distances differ meaningfully along the preference nodes of our measure for delegation.

[Table 4: Degree of Delegation -- higher values signal a preference for more autonomy]

Our final regression panel focuses on differences in the preferred form of delegation. We explore whether and when robo-advisors may be preferred to human advisors. Whether or how this relates to financial literacy and trust is not currently well understood. In fact, it is possible that exposure to robo-advice is still limited. For this reason, we explicitly defined the term when asking about it.<sup>34</sup> Our question posits a preference for robo-advice, *“I would feel more comfortable using a robo advisor than a human financial advisor,”* and responses are measured in terms of their level of agreement or disagreement, increasing in disagreement. Thus, increasing disagreement suggests a stronger preference for humans over the robo-type of delegation.

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<sup>34</sup> See survey question T14 in the included appendix.

Relating to trust-in-people, the broad generic composite returns no meaningful results. However we find that differences across types of people trusted do relate to preferences for the form of delegation. Trust in people like yourself and trust in financial advisors are correlated with increased preference for human advisors; the result for advisors is statistically strongest between them. Increased trust in journalists and car sales people appears more correlated with preference for a robo-advisor. Regarding the journalist result, it may be that respondents sense the need for accurate news because this news is fed into the algorithms that robo-platforms rely on to make allocation decisions. The result for the car sales people does not have an obvious explanation, perhaps those who trust car sales people may be more accepting of standard pre-packaged advice, generally.

Results regarding aspects of financial markets and advisors show a strong correlation between positive attitudes and a preference for human advisors. Breaking down that result into its components, agreement with the 'advisors help' question and disagreement with the 'fees as motivation' question are driving the affinity result. There is some spottier evidence that those who think it good to give advisors financial information are more inclined to prefer autonomous robo-advisor platforms. Conditional on preferring more autonomy, one is more likely to prefer the robo-platform to the human advisor when choosing a method for delegation.

Financial literacy is quite strongly correlated with preferences for either human or robo-advisors. Again, the relationship appears non-linear. Starting at low levels of literacy, data show marginal increases in literacy are correlated with a greater preference for human advice, but the preference relationship attenuates as financial literacy improves. This result is consistent with the idea that investors expect human advice to come with more coaching and orientation than robo-products. For example, less financially literate investors who are interested in learning may feel more confident in their ability to understand human-advisor services because a discussion offers opportunities to ask a series of related or clarifying questions.

Otherwise results show that preferences for robo-advisors are correlated with holding fewer accounts. Those with children demonstrate a preference for human advisors, that is larger in magnitude and statistically stronger than the milder opposing preference for robo-platforms

among married respondents in our sample. These last two results are consistent with the pattern of preferences observed in the more generic analysis on delegation (last table). They all may relate somewhat to age, and again, we are comfortable simply considering these as controls. The bottom panel highlights a strong non-linearity in preferences within our dependent variable, again affirming our choice of regression model.

[Table 5 Degree of Preference for a Human rather than an a "Robo"-Advisor]

## **5.0 Conclusions**

In exploring the roles played by trust and financial literacy in forming preferences for financial market participation, work here suggests that all three are related in several ways. Trust in both people and financial markets is strongly and positively related to financial market participation. Financial literacy, unlike trust, does not display a linear relationship with financial market participation. Increasing levels of financial literacy are initially correlated with a decrease in market participation, but this relationship is reversed as literacy continues to increase.

Finally, both financial literacy and trust strongly affect the way our subjects engage with the financial markets. Increasing levels of trust in others are positively related to the tendency to delegate decision making to professionals while trust in people like oneself is correlated with a preference for autonomous decision making. When considering the difference between financial advisors and automated platforms, we find that those with more trust in human financial advisors are more inclined to use them. More financially literate people show comfort with greater levels of financial autonomy in decision making. When choosing a form of delegation, those with lower levels of financial literacy show a greater inclination for human-based advice than others.

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Table 1: Summary Statistics for The Regression Sample and Related Samples

Variable	N	Mean	Std Dev	Min	Max
<b>Dependent Variables</b>					
Number of ways one can buy equities	721	1.94	1.72	0	7
- Preferred Degree of Delegation in Investment Decisions	721	3.40	1.10	1	5
- More comfortable using a robo advisor	721	3.36	1.11	1	5
<b>Trust in People</b>					
Average Trust In All Types of People (composite)	721	3.07	0.61	1	4.75
Doctor	721	4.04	0.90	1	5
Person Like Yourself	721	4.02	0.84	1	5
Your Employer	721	3.47	0.95	1	5
Financial Advisor	721	3.38	0.94	1	5
Journalist	721	2.90	1.08	1	5
CEO	721	2.47	1.02	1	5
Government Official	721	2.41	1.06	1	5
Car Sales Person	721	1.86	0.90	1	5
<b>Trust in Financial Sector</b>					
Attitudes towards Wall Street and Financial Advisors (composite)	721	3.31	0.61	1.5	5
- Wall Street is stacked against the average investor	721	2.31	1.09	1	5
- Financial advisors help clients with complex products	721	2.03	0.84	1	5
- Financial advisors offer complex products to justify high fees	721	2.67	1.07	1	5
- It is good to give financial advisors your financial information	721	1.71	0.89	1	5
<b>Financial Literacy and Wellbeing</b>					
Score on financial literacy quiz	721	6.86	1.82	0	10
<b>CFPB Wellbeing Measures</b>					
- Have money left over at the end of the month	721	3.42	1.22	1	5
Concerned money saved will run out	721	2.50	1.26	1	5
<b>Experience with assets (other than equities)</b>					
Checking Account Ownership	721	0.88	binary	0	1
Home Ownership	721	0.46	binary	0	1
Defined Benefit Plan Participation	721	0.19	binary	0	1
<b>Demographic and Socioeconomic Attributes</b>					
Education - categorical 1-8: { < high school, ..., doctoral degree }	721	4.37	1.48	1	8
College graduate	721	0.55	binary	0	1
Masters graduate	721	0.11	binary	0	1
Age & Income (interacted)	721	7.22	5.15	1	40
Income - categorical 1-6: { <25K - 250K > }	721	2.64	1.41	1	8
Income below sample median	721	0.53		0	1
Age - categorical 1-6: {18yr - 66+}	721	2.72	1.01	1	6
Retired - stepped: (not-0.0, partially-0.5, fully-1.0)	721	0.43	binary	0	1
White/Caucasian	721	0.66	binary	0	1
Female	721	0.44	binary	0	1
Married	721	0.42	binary	0	1
Parent of Child/Children	721	0.43	binary	0	1
<b>Matched Phase 3 Sample for comparison of composite person-trust</b>					
WVS / GSS Trust question	273	3.029	1.206	1	5
Average Trust In All Types of People	273	3.024	0.642	1	4.5

- Question is intentionally placed in a negative frame.

- Inverted scale: values increase in level of disagreement -- Corrected in data as presented

Table 2: Comparison of Financial literacy Question Responses Across Three Samples

Question	MTurk panels		
	Fisch & Seligman	Fisch, Wilkinson-Ryan, Firth (2016)*	FINRA*
<i>Lusardi &amp; Mitchell -- "Big 3:"</i>			
LM1: Compounding	<b>92%</b>	90%	98%
LM2: Inflation & Savings	<b>84%</b>	84%	98%
LM3: Safety of Stocks vs. Mutual Funds	<b>90%</b>	80%	96%
<i>Other Multiple Choice:</i>			
MC: Mutual Funds can diversify	<b>60%</b>		
MC: Compare the returns of two projects	<b>61%</b>		
<i>Other True False:</i>			
TF: DC Plan Payments Fixed?	<b>41%</b>		
TF: Relationship between risk and return in long run	<b>80%</b>	48%	73%
TF: Index funds vary based on manager experience	<b>21%</b>	35%	68%
TF: Possible to lose money in mutual fund	<b>86%</b>	89%	100%
TF: Diversification reduces variability	<b>72%</b>	44%	67%
Average Total Score:	<b>69%</b>	65%	89%
Average Across all Common Items:	<b>74%</b>	67%	86%
Average for "Big 3" Scores	<b>89%</b>	83%	97%
<i>Sample Size</i>	<b>721</b>	146	60
		201	

*Table Notes:*

\*: Results taken from Fisch, Wilkinson-Ryan, and Firth (2016) Table 3.

FINRA column documents percentage of voluntary FINRA respondents getting question correct.

Table 3:

	Poisson Regression									
	1	2	3	4	5	6	7	8	9	10
Number of account types in which one can purchase equities (as a measure of market engagement)										
Average trust in all types of people presented (1 - 5, increasing in degree of trust)	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.13</b>	<b>0.14</b>	<b>0.14</b>			<b>0.12</b>
Trust - Doctor	2.26 **	2.36 **	2.37 **	2.40 **	2.39 **	2.48 **	2.48 **			2.03 **
Trust - Person Like Yourself								-0.04	-0.05	
Trust - Your Employer								-1.14	-1.31	
Trust - Financial Advisor								0.01	0.01	
Trust - Journalist								0.33	0.28	
Trust - CEO								0.00	-0.01	
Trust - Government Official								0.00	-0.01	
Trust - Car Sales Person								0.02	-0.32	
								0.01	0.01	
								0.30	0.37	
								0.06	<b>0.06</b>	
								1.63	1.70 *	
								0.02	0.02	
								0.57	0.58	
								<b>0.06</b>	<b>0.06</b>	
								1.70 *	1.71 *	
Attitudes towards Wall Street and Financial Advisors (composite) (average of next four items - increases represent more positive sentiments)	<b>-0.10</b>	<b>-0.09</b>	<b>-0.10</b>	<b>-0.10</b>	<b>-0.10</b>	<b>-0.10</b>	<b>-0.10</b>	<b>-0.10</b>	<b>-0.08</b>	
Wall Street is stacked against avg investor (1 - 5, increasing in level of disagreement)	-1.71 *	-1.63	-1.73 *	-1.75 *	-1.84 *	-1.86 *	-1.73 *	-1.34		-0.03 -0.01
Financial advisors help clients with complex products (1 - 5 increasing in level of agreement)										-1.08 -0.46
Financial advisors offer complex products to justify high fees (1 - 5, increasing in level of disagreement)										0.01 -0.01
It is good to give financial advisors your financial information (1 - 5 increasing in level of agreement)										0.29 -0.19
										<b>-0.05 -0.06</b>
										-1.66 * -2.08 **
										0.01 -0.01
										0.33 -0.14
More comfortable using a robo advisor (1 - 5, from strongly prefer robo, to strongly disagree that robo is preferable)	<b>-0.08</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.08</b>	<b>-0.07</b>	<b>-0.08</b>	<b>-0.07</b>	<b>-0.06</b>	<b>-0.07</b>
When investing, prefer more autonomy (1 - 5, ranging from complete delegation to autonomy)	-3.08 ***	-2.96 ***	-2.96 ***	-2.95 ***	-2.96 ***	-2.84 ***	-2.95 ***	-2.59 ***	-2.42 **	-2.77 ***
Financial literacy - quiz score (0 - 10, including guessed answers)	<b>-0.24</b>	<b>-0.25</b>	<b>-0.26</b>	<b>-0.26</b>	<b>-0.26</b>	<b>-0.26</b>	<b>-0.25</b>	<b>-0.22</b>	<b>-0.21</b>	<b>-0.24</b>
Financial literacy - square of quiz score squared values of the above	-2.97 ***	-2.99 ***	-3.17 ***	-3.17 ***	-3.14 ***	-3.14 ***	-2.97 ***	-2.58 ***	-2.43 **	-2.80 ***
Have money left over at the end of the month (1 - 5, ranging from "never," to "always")	<b>0.06</b>	<b>0.07</b>	<b>0.06</b>							
Concerned money saved will run out (1 - 5, ranging from "completely," to "not at all")	2.13 **	2.20 **	2.14 **	2.15 **	2.13 **	2.14 **	1.97 **	2.18 **	2.22 **	1.99 **
Has or had a Defined Benefit type employer pension (0, 1 - for whether the respondent has this type of pension)	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
Has or had a home or condo (0, 1 - for whether the respondent has this type of asset)	0.60	0.54	0.58	0.53	0.57	0.50	0.54	0.65	0.93	0.67
Has or had a checking account (0, 1 - for whether the respondent has this type of account)	<b>0.36</b>	<b>0.36</b>	<b>0.36</b>	<b>0.36</b>	<b>0.36</b>	<b>0.36</b>	<b>0.39</b>	<b>0.37</b>	<b>0.37</b>	<b>0.39</b>
Level of education categorical 1-8: { < high school, ..., doctoral degree}	4.72 ***	4.70 ***	4.80 ***	4.81 ***	4.80 ***	4.78 ***	5.15 ***	4.86 ***	4.82 ***	5.17 ***
College graduate (0, 1 - for whether the respondent has graduated college)	<b>0.39</b>	<b>0.39</b>	<b>0.40</b>	<b>0.40</b>	<b>0.41</b>	<b>0.41</b>	<b>0.47</b>	<b>0.45</b>	<b>0.44</b>	<b>0.46</b>
Masters or doctoral degree (0, 1 - for whether the respondent has an advanced degree)	5.67 ***	5.68 ***	5.75 ***	5.74 ***	5.90 ***	6.07 ***	7.21 ***	6.93 ***	6.77 ***	6.97 ***
Level of education, squared picks up attenuation, past college more continuously across categories	<b>0.30</b>	<b>0.29</b>	<b>0.28</b>	<b>0.28</b>	<b>0.28</b>	<b>0.29</b>	<b>0.27</b>	<b>0.29</b>	<b>0.28</b>	<b>0.27</b>
Income categorical 1-6: {<25K - 250K>}	2.35 **	2.28 **	2.23 **	2.23 **	2.22 **	2.32 **	2.12 **	2.31 **	2.22 **	2.10 **
Income lower than median <50K> (0, 1 - for whether the respondent has relatively low income)	1.92 *	1.95 *	4.22 ***	4.23 ***	4.27 ***	4.26 ***	4.34 ***	4.46 ***	4.23 ***	4.18 ***
Interaction term - age by income (age x income)	0.05	0.05								
Age categorical 1-6: {18yr - 66+}	0.39	0.40								
Age squared squared values of the above	<b>-0.37</b>	<b>-0.37</b>								
Retired - in degrees, partial & full (0, 1/2, 1, partially retired have a lower number of accounts)	-2.66 ***	-2.69 ***	<b>-0.04</b>							
White / Caucasian (0, 1 - for whether the respondent is white/cucasian)			-3.81 ***	-3.81 ***	-3.87 ***	-3.89 ***	-4.02 ***	-4.16 ***	-3.91 ***	-3.85 ***
Female (0, 1 - for whether the respondent is female)	<b>0.11</b>	<b>0.11</b>	<b>0.11</b>	<b>0.10</b>	<b>0.07</b>	<b>0.07</b>	<b>0.08</b>	<b>0.09</b>	<b>0.08</b>	<b>0.08</b>
Currently married (0, 1 - for whether the respondent is married)	1.89 *	1.93 *	1.88 *	1.83 *	3.28 ***	3.43 ***	4.35 ***	4.51 ***	4.39 ***	4.18 ***
Children (0, 1 - for whether the respondent has one or more)	0.04	0.04	0.03							
Constant	0.48	0.46	0.42							
Observations	-0.01	-0.01	-0.01	-0.01						
	-0.86	-0.88	-0.73	-0.69						
	<b>0.27</b>	<b>0.27</b>	<b>0.24</b>	<b>0.24</b>	0.21	<b>0.07</b>	<b>0.08</b>	<b>0.08</b>	<b>0.09</b>	<b>0.08</b>
	1.93 *	1.92 *	1.68 *	1.68 *	1.52	2.67 ***	2.86 ***	2.94 ***	3.08 ***	2.96 ***
	-0.03	-0.03	-0.02	-0.02	-0.02					
	-1.30	-1.28	-1.05	-1.06	-1.13					
	<b>0.26</b>	<b>0.27</b>	<b>0.27</b>	<b>0.27</b>	<b>0.27</b>	<b>0.29</b>	<b>0.33</b>	<b>0.31</b>	<b>0.32</b>	<b>0.33</b>
	1.95 *	2.05 **	2.05 **	2.05 **	2.04 **	2.14 **	2.45 **	2.36 **	2.36 **	2.42 **
	<b>-0.24</b>	<b>-0.24</b>	<b>-0.23</b>	<b>-0.23</b>	<b>-0.24</b>	<b>-0.24</b>	<b>-0.25</b>	<b>-0.21</b>	<b>-0.22</b>	<b>-0.26</b>
	-4.00 ***	-3.99 ***	-3.87 ***	-3.89 ***	-3.95 ***	-3.92 ***	-4.16 ***	-3.46 ***	-3.54 ***	-4.26 ***
	<b>-0.19</b>	<b>-0.19</b>	<b>-0.19</b>	<b>-0.19</b>	<b>-0.20</b>	<b>-0.19</b>	<b>-0.15</b>	<b>-0.16</b>	<b>-0.15</b>	<b>-0.15</b>
	-3.30 ***	-3.22 ***	-3.39 ***	-3.44 ***	-3.47 ***	-3.38 ***	-2.78 ***	-2.89 ***	-2.74 ***	-2.70 ***
	<b>0.13</b>	<b>0.12</b>	<b>0.12</b>	<b>0.12</b>	<b>0.12</b>	<b>0.19</b>				
	1.88 *	1.79 *	1.82 *	1.80 *	1.86 *	2.85 ***				
	0.11	0.11	0.09	0.10	0.09					
	1.59	1.64	1.43	1.46	1.42					
	<b>-0.38</b>	<b>-0.49</b>	<b>-0.91</b>	<b>-0.86</b>	<b>-0.78</b>	<b>-0.59</b>	<b>-0.65</b>	<b>-0.70</b>	<b>-0.82</b>	<b>-0.72</b>
	-0.80	-1.09	-1.96 **	-1.91 *	-1.78 *	-1.50	-1.65 *	-1.72 *	-1.95 *	-1.77

Robust z-statistics in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4:

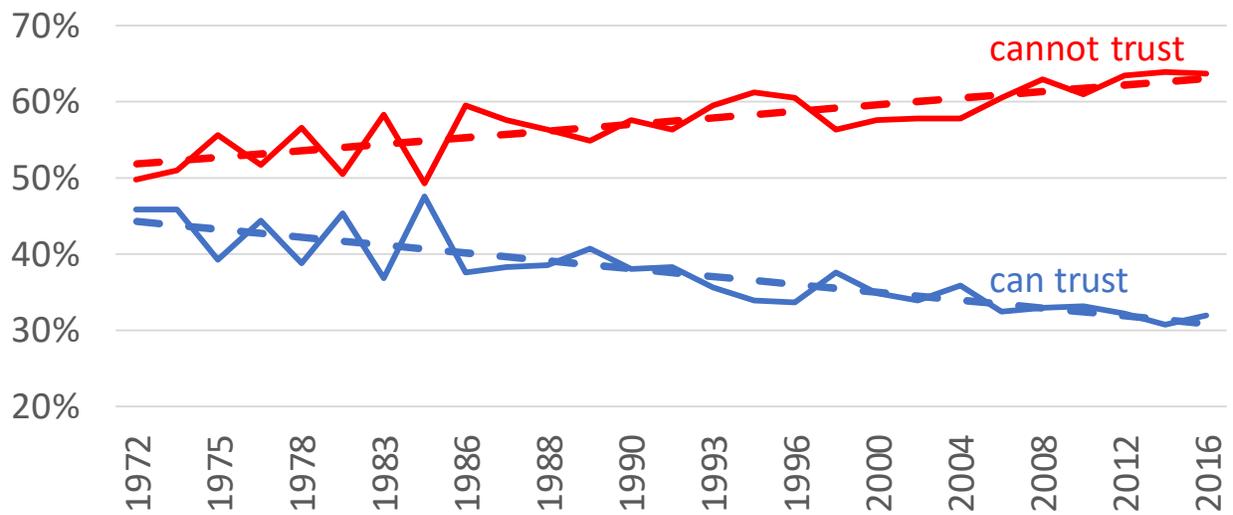
Degree of Delegation -- higher values signal a preference for more autonomy	Ordered Probit Regressions									
	1	2	3	4	5	6	7	8	9	10
Average Trust In All Types of People <i>(1 - 5, increasing in degree of trust)</i>	-0.25	-0.25	-0.24	-0.25	-0.25	-0.25	-0.25	-0.25		-0.22
Trust - Doctor	-3.27 ***	-3.27 ***	-3.13 ***	-3.26 ***	-3.29 ***	-3.30 ***	-3.34 ***		-0.08	-0.07
Trust - Person Like Yourself									-1.56	-1.29
Trust - Your Employer									0.15	0.16
Trust - Financial Advisor									2.81 ***	2.89 ***
Trust - Journalist									-0.12	-0.10
Trust - CEO									-2.15 **	-1.84 *
Trust - Government Official									-0.21	-0.16
Trust - Car Sales Person									-3.66 ***	-2.68 ***
Attitudes towards Wall Street and Financial Advisors (composite) <i>(average of next four items - increases represent more positive sentiments)</i>	-0.28	-0.28	-0.29	-0.28	-0.28	-0.28	-0.26	-0.18		
Wall Street is stacked against avg investor <i>(1 - 5, increasing in level of disagreement)</i>	-3.71 ***	-3.71 ***	-3.81 ***	-3.69 ***	-3.68 ***	-3.67 ***	-3.46 ***	-2.24 **	0.04	0.06
Financial advisors help clients with complex products <i>(1 - 5 increasing in level of agreement)</i>									0.90	1.45
Financial advisors offer complex products to justify high fees <i>(1 - 5, increasing in level of disagreement)</i>									-0.20	-0.23
It is good to give financial advisors your financial information <i>(1 - 5 increasing in level of agreement)</i>									-3.22 ***	-3.96 ***
More comfortable using a robo advisor <i>(1 - 5, from strongly prefer robo, to strongly disagree that robo is preferable)</i>	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.11	-0.11	-0.11
Financial Literacy - quiz score <i>(0 - 10, including guessed answers)</i>	6.20 ***	6.20 ***	6.12 ***	6.15 ***	6.35 ***	6.37 ***	6.84 ***	6.34 ***	6.04 ***	6.56 ***
Have money left over at the end of the month <i>(1 - 5, ranging from "never," to "always")</i>	-0.07	-0.07	-0.06	-0.06	-0.07	-0.06	-0.06	-0.05	-0.05	-0.05
Concerned money saved will run out <i>(1 - 5, ranging from "completely," to "not at all")</i>	1.72 *	1.72 *	1.85 *	1.75 *	1.75 *	1.77 *	1.64	1.54	1.18	1.02
Number of ways one can buy equities <i>(0 - 7, options include DC plans, brokerage accounts, etc.)</i>	-0.02	-0.02	-0.03	-0.02	-0.02	-0.02	-0.02	-0.03	-0.02	-0.01
Has or had a Defined Benefit type employer pension <i>(0, 1 - for whether the respondent has this type of pension)</i>	-0.03	-0.03	-0.02	-0.03						
Has or had a home or condo <i>(0, 1 - for whether the respondent has this type of asset)</i>	0.27	0.27	0.27	0.27	0.27	0.28				
Has or had a checking account <i>(0, 1 - for whether the respondent has this type of account)</i>	0.03	0.03	0.04	0.03	0.03					
Level of education <i>categorical 1-8: { &lt; high school, ..., doctoral degree}</i>	-0.08	-0.08	0.01	-0.21	-0.21	-0.21	-0.22	-0.21	-0.19	-0.18
College graduate <i>(0, 1 - for whether the respondent has graduated college)</i>	-1.13	-1.13	0.16	-1.56	-1.56	-1.57	-1.63	-1.58	-1.38	-1.36
Masters or doctoral degree <i>(0, 1 - for whether the respondent has an advanced degree)</i>	0.03	0.03	-0.13							
Level of education, squared <i>picks up attenuation, post college more continuously across categories</i>	0.34	0.34		0.02	0.02	0.02	0.02	0.02	0.02	0.02
Income <i>categorical 1-6: {&lt;25K - 250K}</i>	1.68 *	1.68 *		1.40	1.39	1.41	1.48	1.38	1.20	1.22
Income lower than median <50K <i>(0, 1 - for whether the respondent has relatively low income)</i>	-0.14	-0.14	-0.15	-0.14	-0.14	-0.14	-0.14	-0.13	-0.12	-0.13
Interaction term - age by income <i>(age x income)</i>	-1.40	-1.40	-1.49	-1.44	-1.43	-1.41	-1.42	-1.54	-1.42	-1.58
Age <i>categorical 1-6: {18yr - 66+}</i>	0.05	0.05	0.05	0.05	0.05	0.05	0.04			
Age squared <i>squared values of the above</i>	0.34	0.34	0.39	0.36	0.36	0.34	0.29			
Retired - in degrees, partial & full <i>(0, 1/2, 1, partially retired have a lower number of accounts)</i>	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02
White / Caucasian <i>(0, 1 - for whether the respondent is white/caucasian)</i>	1.08	1.08	1.23	1.09	1.08	1.07	1.07	1.00	0.78	0.82
Female <i>(0, 1 - for whether the respondent is female)</i>	0.09	0.09	0.10	0.11	0.11	0.11	0.14	0.19	0.24	0.25
Currently married <i>(0, 1 - for whether the respondent is married)</i>	0.42	0.42	0.47	0.50	0.51	0.51	0.68	0.92	1.13	1.17
Children <i>(0, 1 - for whether the respondent has one or more)</i>	-0.03	-0.03	-0.03	-0.04	-0.04	-0.03	-0.04	-0.05	-0.06	-0.05
/cut1 <i>from complete delegation to periodic review of advisor decisions</i>	-1.07	-1.07	-1.13	-1.16	-1.17	-1.16	-1.33	-1.66 *	-1.81 *	-1.76 *
/cut2 <i>from periodic review to speak with advisor as an equal, then have them transa</i>	-0.39	-0.39	-0.37	-0.39	-0.39	-0.39	-0.39	-0.45	-0.45	-0.42
/cut3 <i>from adviser as equal, to receive input &amp; make own decisions</i>	-1.77 *	-1.77 *	-1.71 *	-1.78 *	-1.78 *	-1.79 *	-1.80 *	-2.05 **	-2.03 **	-1.92 *
/cut4 <i>from advisor input to decisions to preference for using a website on own</i>	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.12	-0.06	-0.07	-0.11
Observations	-1.29	-1.29	-1.34	-1.32	-1.31	-1.29	-1.26	-0.64	-0.66	-1.07

Table 5:

Degree of Preference for a Human rather than a "Robo"-advisor	Ordered Probit Regressions									
	1	2	3	4	5	6	7	8	9	10
Average trust in all types of people presented (1 - 5, increasing in degree of trust)	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03		-0.04
Trust - Doctor	-0.36	-0.36	-0.35	-0.34	-0.35	-0.37	-0.41			-0.50
"								0.04	0.04	
Trust - Person Like Yourself								0.68	0.85	
"								1.83 *	1.80 *	
Trust - Your Employer								0.06	0.05	
"								1.16	1.00	
Trust - Financial Advisor								0.11	0.11	
"								1.98 **	1.91 *	
Trust - Journalist								-0.11	-0.12	
"								-2.59 ***	-2.80 ***	
Trust - CEO								0.01	0.00	
"								0.12	0.09	
Trust - Government Official								-0.04	-0.03	
"								-0.84	-0.69	
Trust - Car Sales Person								-0.15	-0.14	
"								-2.66 ***	-2.49 **	
Attitudes towards Wall Street and Financial Advisors (composite) (average of next four items - increases represent more positive sentiments)	0.22	0.22	0.22	0.22	0.22	0.23	0.23	0.15		
Wall Street is (not) stacked against avg investor (1 - 5, increasing in level of disagreement)	2.93 ***	2.93 ***	2.92 ***	2.92 ***	2.96 ***	3.12 ***	3.13 ***	1.91 *		
Financial advisors help clients with complex products (1 - 5 increasing in level of agreement)									0.01	0.00
Financial advisors (don't) offer complex products to justify high fees (1 - 5, increasing in level of disagreement)									0.27	-0.01
It is good to give financial advisors your financial information (1 - 5 increasing in level of agreement)									0.14	0.20
"									2.30 **	3.61 ***
When investing, prefer more autonomy (1 - 5, ranging from complete delegation to autonomy)	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.12	-0.11	-0.11	-0.11
"	-3.11 ***	-3.12 ***	-3.13 ***	-3.13 ***	-3.13 ***	-3.07 ***	-3.07 ***	-2.82 ***	-2.71 ***	-2.74 ***
Financial Literacy - quiz score (0 - 10, including guessed answers)	0.31	0.31	0.31	0.31	0.31	0.32	0.32	0.29	0.27	0.30
Financial Literacy - square of quiz score squared values of the above	2.35 **	2.36 **	2.37 **	2.37 **	2.37 **	2.43 **	2.43 **	2.20 **	2.05 **	2.27 **
Have money left over at the end of the month (1 - 5, ranging from "never," to "always")	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
"	-2.29 **	-2.30 **	-2.30 **	-2.31 **	-2.31 **	-2.33 **	-2.34 **	-2.12 **	-1.89 *	-2.08 **
Concerned money saved will run out (1 - 5, ranging from "completely," to "not at all")	-0.04	-0.04	-0.04	-0.04	-0.04	-0.03	-0.03	-0.05	-0.06	-0.04
"	-0.92	-0.92	-0.91	-0.90	-0.90	-0.84	-0.84	-1.31	-1.38	-0.98
Number of ways one can buy equities (0 - 7, options include DC plans, brokerage accounts, etc.)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.05
"	1.31	1.31	1.35	1.36	1.38	1.32	1.37	1.20	0.89	1.21
Has or had a Defined Benefit type employer pension (0, 1 - for whether the respondent has this type of pension)	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.08	-0.08	-0.10
"	-3.51 ***	-3.52 ***	-3.50 ***	-3.57 ***	-3.62 ***	-3.52 ***	-3.53 ***	-3.02 ***	-2.91 ***	-3.46 ***
Has or had a home or condo (0, 1 - for whether the respondent has this type of asset)	0.01	0.01	0.01							
"	0.11	0.10	0.10	0.03						
Has or had a checking account (0, 1 - for whether the respondent has this type of account)	0.02	0.02	0.02	0.03	0.03	0.04	0.04	0.04	0.03	0.03
"	0.23	0.23	0.24	0.25						
Level of education categorical 1-8: { < high school, ..., doctoral degree }	0.14	0.14	0.14	0.14	0.14	1.19	1.23	1.46	1.15	0.88
"	1.08	1.08	1.06	1.06	1.09					
Income categorical 1-6: {<25K - 250K>}	0.02	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.03
"	0.31	0.41	1.12	1.15	1.17	1.19	1.23	1.46	1.15	0.88
Income lower than median <50K> (0, 1 - for whether the respondent has relatively low income)	0.05	0.05								
"	0.28	0.36								
Interaction term - age by income (age x income)	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
"	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.07	-0.07	-0.07
Age categorical 1-6: {18yr - 66+}	-0.08	-0.08	-0.08	-0.08	-0.07	-0.07	-0.05	-0.07	-0.07	-0.07
"	-0.78	-0.78	-0.78	-0.79	-0.77	-0.78	-0.65	-0.78	-0.86	-0.78
Age squared squared values of the above	-0.05	-0.05	-0.05	-0.05	-0.06	-0.06				
"	-0.38	-0.39	-0.40	-0.40	-0.41	-0.43				
Retired (0, 1 - for whether the respondent is retired)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
"	0.87	0.87	0.87	0.88	0.86	0.87	0.82	0.92	1.13	1.11
White / Caucasian (0, 1 - for whether the respondent is white/caucasian)	0.13	0.13	0.13	0.13	0.13	0.15	0.15	0.00	0.02	0.13
"	0.64	0.64	0.63	0.63	0.63	0.72	0.71	0.01	0.10	0.61
Female (0, 1 - for whether the respondent is female)	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.01	0.00	-0.01
"	-0.27	-0.27	-0.26	-0.26	-0.25	-0.33	-0.31	0.33	0.06	-0.41
Currently married (0, 1 - for whether the respondent is married)	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.02	-0.07	-0.13
"	-0.45	-0.46	-0.44	-0.45	-0.46	-0.46	-0.45	-0.11	-0.31	-0.58
Children (0, 1 - for whether the respondent has one or more)	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.07	-0.05	-0.03
"	-0.51	-0.51	-0.52	-0.53	-0.51	-0.49	-0.49	-0.71	-0.50	-0.34
Observations	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.08	-0.09	-0.07
"	-0.79	-0.79	-0.80	-0.80	-0.80	-0.80	-0.76	-0.86	-1.02	-0.82
Observations	-0.21	-0.21	-0.21	-0.21	-0.20	-0.21	-0.21	-0.20	-0.20	-0.19
"	-1.89 *	-1.89 *	-1.89 *	-1.88 *	-1.87 *	-1.94 *	-1.92 *	-1.85 *	-1.81 *	-1.78 *
Observations	0.30	0.30	0.29	0.29	0.30	0.30	0.30	0.26	0.25	0.28
"	2.66 ***	2.66 ***	2.64 ***	2.64 ***	2.68 ***	2.68 ***	2.67 ***	2.34 **	2.25 **	2.47 **
Observations	-0.31	-0.32	-0.28	-0.29	-0.27	-0.29	-0.21	-0.31	-0.54	-0.35
"	-0.45	-0.47	-0.42	-0.43	-0.41	-0.43	-0.32	-0.47	-0.82	-0.55
Observations	0.70	0.70	0.73	0.73	0.75	0.73	0.81	0.73	0.50	0.67
"	1.02	1.03	1.10	1.09	1.12	1.10	1.27	1.12	0.76	1.04
Observations	1.46	1.45	1.49	1.48	1.50	1.48	1.57	1.49	1.28	1.43
"	2.10 **	2.15 **	2.22 **	2.22 **	2.25 **	2.22 **	2.45 **	2.30 **	1.94 *	2.21 **
Observations	2.49	2.48	2.52	2.51	2.53	2.51	2.59	2.55	2.34	2.47
"	3.56 ***	3.65 ***	3.74 ***	3.74 ***	3.78 ***	3.75 ***	4.04 ***	3.91 ***	3.54 ***	3.79 ***
Observations	721	721	721	721	721	721	721	721	721	721

Figure 1: Trust over time in the U.S.

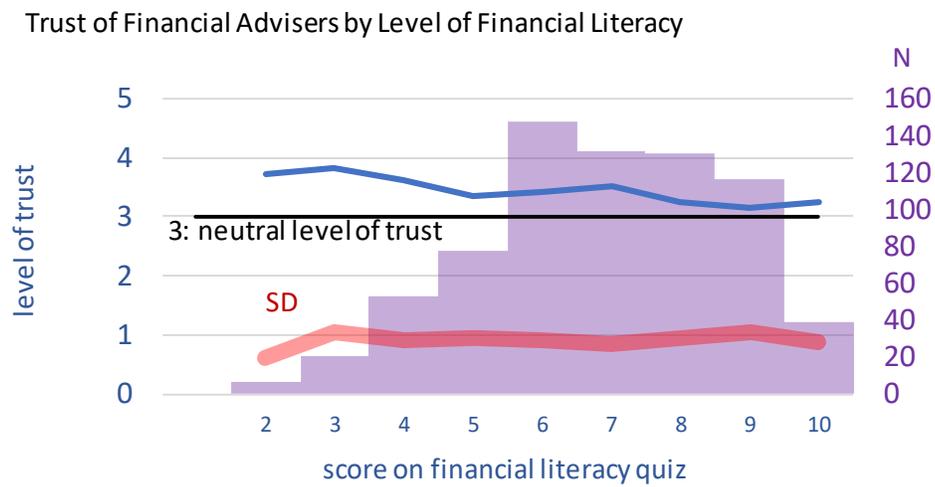
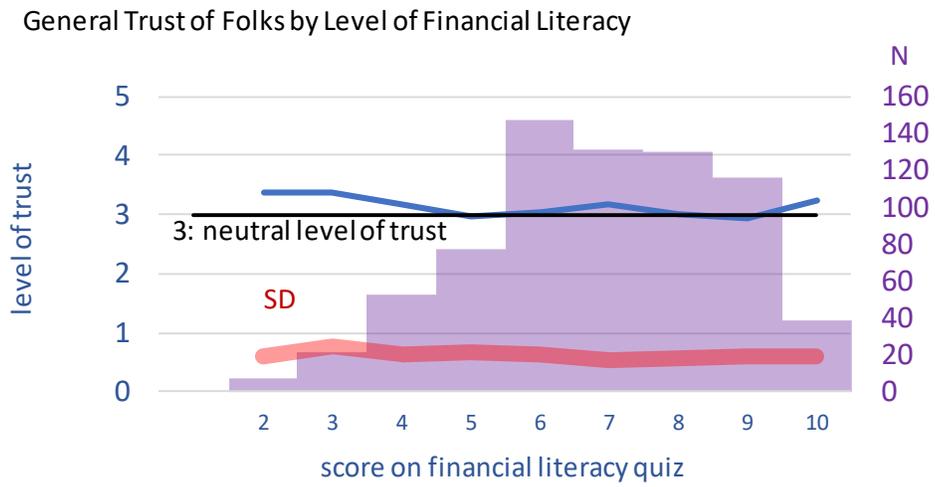
*“Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?”*



Data: NORC General Social Survey, accessed on line 1/10/2019

<https://gssdataexplorer.norc.org/variables/441/vshow>

Figure 2: Patterns of Trust and Financial literacy



Data: Authors' Mechanical Turk Data Collection.

Sample of 721 individuals interviewed in spring and summer of 2018.

Figure 3: Financial literacy in the Context of Three Dependent Variables

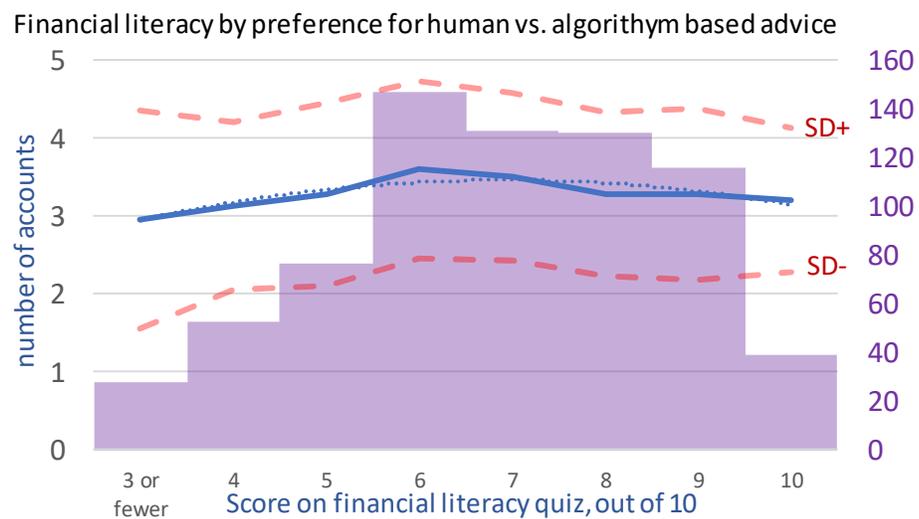
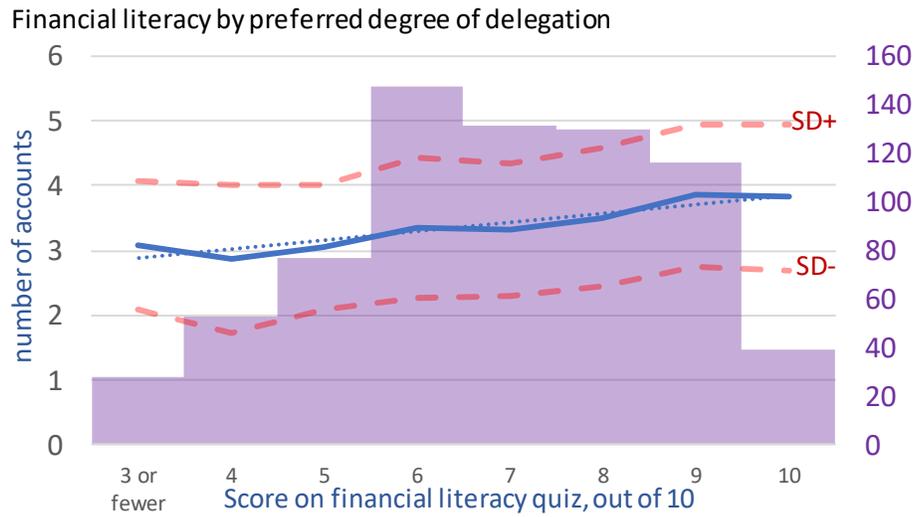
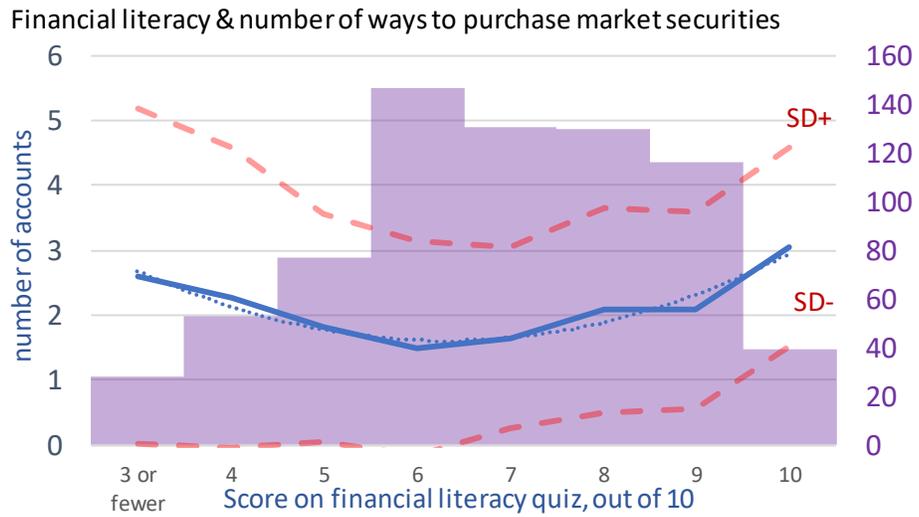
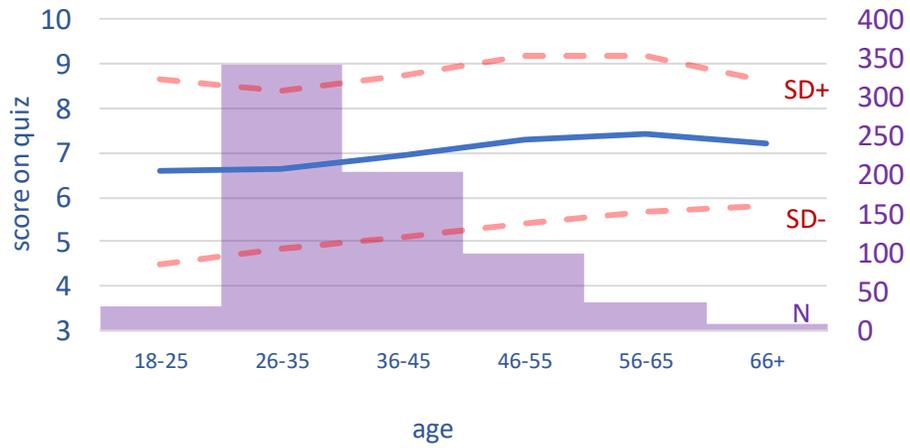
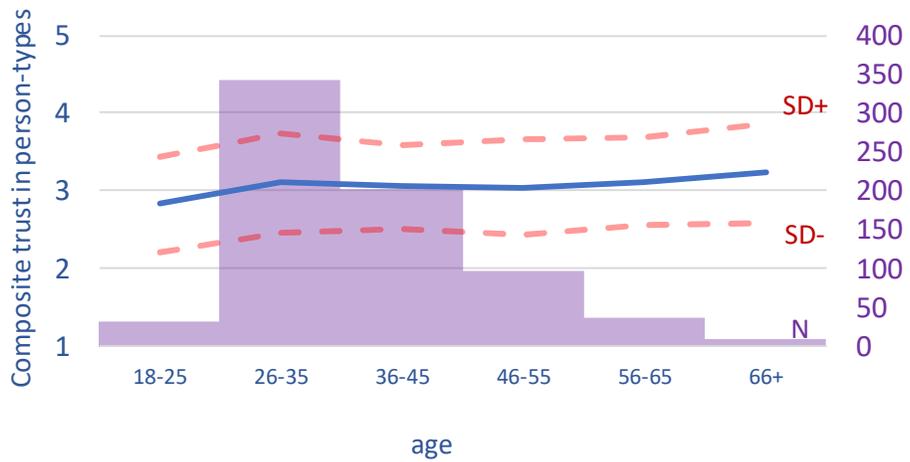


Figure 4: Financial literacy Trust and Number of Accounts, by Age

Financial literacy by age



Trust across all types of folks by age



Number of accounts with which to purchase equities by age

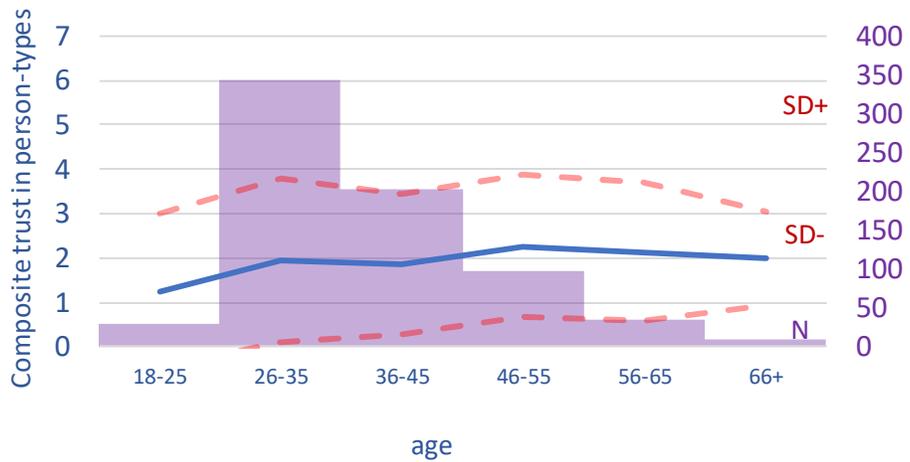
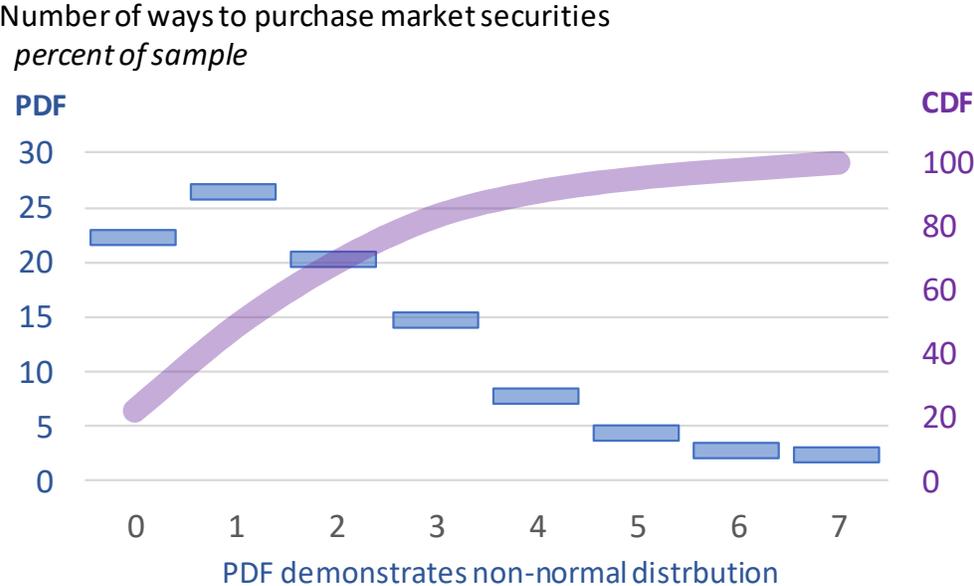


Figure 5: Sample Distribution of Financial market participation, Variable



## Appendix 1: Fisch and Seligman Survey

### Appendix 1: Survey as Fielded – Data Collection Stages two and three:

#### Initiation Block

*welcome.*

You are invited to participate in a study of factors that may influence financial decision-making. If you agree to participate in the study you will be asked to answer a series of questions. The total time required to complete the experiment should be about 20 minutes, but you may take as much time as you need. You will receive \$2.50 for a complete survey.

The foreseeable risks associated with participation in this study are minimal. Any information obtained in connection with this study will be strictly confidential. Your identity will not be provided to the researchers. In any written reports or publications, only aggregate data will be presented.

You must be 18 or older to participate in this study. Your decision whether or not to participate is voluntary. If you decide to participate, you are free to discontinue participation at any time.

Selecting "I agree" below means that you have read this consent form, you are over 18, and you understand that you may stop participating in this study at any time.

Please indicate whether you agree to participate in the study

- Yes, I agree to participate in the study.
- No, I would not like to participate in the study.

*AMTID.* Please input your Amazon Mechanical Turk Worker ID. Remember, you can find your Worker ID by clicking on Your Account --> Dashboard.

*notice.* Note: This site is not compatible with the navigation provided by internet browsers. All movement between pages is provided by custom buttons on the survey

## Appendix 1: Fisch and Seligman Survey

itself.

Please do not click your browser's "Back" button. If you accidentally do so you may see a blank page or an error dialog about how the back button may not be used. If you see a blank page you can try to reload the page. If you see the error dialog you can close the dialog and should be redirected to the page you were on before you hit the Back button.

*ISA-alt.*

Before we begin, how would you rate your knowledge of stock markets and financial products?

- very knowledgeable
- pretty knowledgeable
- normal/average
- less knowledgeable than most
- not knowledgeable

### **Fin Lit**

*F1.*

These questions, which are about financial knowledge, vary in difficulty, and you may not be able to answer all of them. If you are not sure of the answer, please just give us your best guess.

Suppose you had \$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 to grow?

- More than \$102
- Exactly \$102
- Less than \$102
- I do not know

## Appendix 1: Fisch and Seligman Survey

F1g. If you had to guess, which of the following is most likely accurate?

(recall the question: *Suppose you had \$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 to grow?*)

- More than \$102
- Exactly \$102
- Less than \$102

F2. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

- More than today
- Exactly the same as today
- Less than today
- I do not know

F2g. If you had to guess, which would you guess to be correct?

(recall the question: *Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?*)

- More than today
- Exactly the same as today
- Less than today

F3.

Do you think that the following statement is true or false? "Buying a single company stock usually provides a safer return than a stock mutual fund."

## Appendix 1: Fisch and Seligman Survey

- True
- False
- I do not know

F3g.

If you had to guess, would you *guess* that the statement "Buying a single company stock usually provides a safer return than a stock mutual fund," is:

- True
- False

F4. A "Defined Contribution" plan, such as a 401(k) plan, promises to pay participants a fixed amount each month following retirement.

- True
- False
- I do not know

F4g. If you had to, would you *guess* that the statement: "A 'Defined Contribution' plan, such as a 401(k) plan, promises to pay participants a fixed amount each month following retirement," is:

- True
- False

F5. Which of the following statements is correct?

- Once you invest in a mutual fund, you cannot withdraw the money for the first year
- Mutual funds can invest in several types of assets, for example, a mutual fund can invest in both stocks and bonds
- Mutual funds pay a guaranteed rate of return which depends on their past performance
- Mutual fund that charge higher fees generally return more, net of those fees.
- All of the above
- None of the above

## Appendix 1: Fisch and Seligman Survey

I do not know

F5g. If you had to, which of the following statements would you *guess* is correct?

- Once you invest in a mutual fund, you cannot withdraw the money for the first year
- Mutual funds can invest in several types of assets, for example, a mutual fund can invest in both stocks and bonds
- Mutual funds pay a guaranteed rate of return which depends on their past performance
- Mutual fund that charge higher fees generally return more, net of those fees.
- All of the above
- None of the above

F6. You are asked to compare two projects:

- Project A will either deliver a return of 10% or 6% with either outcome equally likely.
- Project B will either deliver a return of 12% or 4% with either outcome equally likely.

Which of the following is true? Compared to Project B, Project A has?

- Higher average return and lower risk
- Same average return and lower risk
- Lower average return and higher risk
- I do not know

F6g. If you had to compare:

- Project A will either deliver a return of 10% or 6% with either outcome equally likely.
- Project B will either deliver a return of 12% or 4% with either outcome equally likely.

Which of the following would you *guess* is true? Compared to Project B, Project A has?

- Higher average return and lower risk
- Same average return and lower risk
- Lower average return and higher risk

## Appendix 1: Fisch and Seligman Survey

F7.

In general, investments that are riskier tend to provide higher returns over time than investments with less risk.

- True
- False
- I do not know

F7g.

If you had to, would you *guess* that the statement: "In general, investments that are riskier tend to provide higher returns over time than investments with less risk," is:

- True
- False

F8-10. Please indicate whether the following statements are true or false.

	True	False
Index fund performance can vary substantially depending on the expertise of the fund managers.	<input type="radio"/>	<input type="radio"/>
It is possible to lose money by investing in a mutual fund.	<input type="radio"/>	<input type="radio"/>
Diversification reduces the variability of the returns of my portfolio.	<input type="radio"/>	<input type="radio"/>

### Fin Lit Post Assessment

A1.

The section above contained 10 questions.

## Appendix 1: Fisch and Seligman Survey

Please estimate the number of questions you answered correctly.

*(Please give a number between 0 and 10)*

A2. How many questions do you think the average participant in this study answered correctly?

*(Please give a number between 0 and 10)*

A3.

This study seeks to understand how people process the questions that are being asked to them. There are many aspects of a person's behavior that are related to the way they answer questions.

One aspect is their ability to stay engaged throughout a survey and a person's willingness to read the directions fully. To make sure you are currently paying attention, for the question below we would like you to answer: "None of the above." Which of the following adjectives would you use to describe yourself?

- I am extremely detail oriented
- I am fairly detail oriented
- I am mostly able to focus but sometimes get distracted
- I am easily distracted
- None of the above

Q63.

Your answer to the last question did not comply with question's instructions and prevent us from using your answers. Your participation in the survey is therefore being terminated, and you will not receive a completion code.

You will now be taken to the end of the survey.

**Financial Sector Engagement and Trust**

Appendix 1: Fisch and Seligman Survey

T0b. Generally, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Please tell us what you think, where 1 means you can't be too careful and 5 means most people can be trusted.

	you can't be too careful			most people can be trusted	
	1	2	3	4	5
level of trust in people					

T1-8. Generally when you consider the following people, how much do you trust them?

	do not trust them at all	find it hard to trust them	neutral	tend to trust them	trust them a great deal
Person Like Yourself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CEO	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Doctor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Car Sales Person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial Advisor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your Employer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Journalist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government Official	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

T9. You are waiting at the airport for your flight to board. You had a long walk to the gate, and your carry-on bag is very heavy.

How likely would you be to ask a stranger to watch your bag while you go to the restroom?

- Extremely likely
- Somewhat likely
- Neither likely nor unlikely
- Somewhat unlikely
- Extremely unlikely

## Appendix 1: Fisch and Seligman Survey

*T10.*

Please tell us the extent to which you agree or disagree with the following questions.

I trust bomb-smelling dogs in airports to do a good job.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

*T11.*

Wall Street is stacked against the average investor

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

*T12.*

Financial advisers help their clients to successfully invest in complex financial products

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

*T13.* Financial advisers offer their clients complex financial products in order to justify charging high fees.

- Strongly agree

## Appendix 1: Fisch and Seligman Survey

- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

*T14.* Robo advisors are built by investment companies to help automate and standardize investment advice. I would feel more comfortable using a robo advisor than a human financial advisor.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

*T15.*

When dealing with a financial adviser, it is a good idea to give them as much information as possible about your finances.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

*T16.* You hear an advertisement on the radio for an investment that pays a guaranteed 12 percent return. The offer is likely to be a fraud.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Appendix 1: Fisch and Seligman Survey

T17. It is safe to keep your money in the bank, because the government insures it.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

T18. I review my bank and credit card statements to make sure that they are correct.

- Every month
- Almost every month
- Occasionally
- Rarely
- Never

CFPB1. How often does this statement apply to you?

*"I have money left over at the end of the month"*

- Always
- Often
- Sometimes
- Rarely
- Never

CFPB2. How well does this statement describe you or your situation?

*"I am concerned that the money I have or will save won't last"*

- Completely
- Very well

## Appendix 1: Fisch and Seligman Survey

- Somewhat
- Very little
- Not at all

T19. When investing I would most likely prefer to:  
(choose one)

- completely delegate investment decisions to a financial adviser rather than making them myself
- delegate investment decisions to a financial adviser, but periodically review them myself
- speak with a financial adviser as an equal, then have them make the transactions we agree to.
- receive input from a financial adviser and then make my own decisions
- make my own investments using a website rather than work with a financial adviser

T20. In the next Presidential election, if your preferred candidate ends up losing, would you accept the election results as legitimate?

- Definitely
- Probably
- Unsure
- Probably not
- Definitely not

T21. When it comes to democracy in the United States, what is closest to your view?

- I have faith
- I have lost faith
- I never had faith

T22. When it comes to democracy in [Russia](#), what is closest to your view?

- I have faith
- I have lost faith
- I never had faith

## Appendix 1: Fisch and Seligman Survey

T23. Please estimate the percentage of people in the United States who cheat on their income taxes

### Demographics

D1.

Finally, we'd like to ask you to help us understand a few basic things about your background. Demographic questions help us compare different groups.

If any of these questions is too personal, please check "prefer not to answer."

Please indicate your gender

- Male
- Female
- Other
- Prefer not to answer

D2. Please indicate your age range

- 18-25
- 26-35
- 36-45
- 46-55
- 56-65
- 66+
- Prefer not to answer

D3. Please help us to understand your historical background, your ethnicity

## Appendix 1: Fisch and Seligman Survey

(check all that apply)

- White / Caucasian
- Black / African American
- Native American / American Indian
- Asian / Pacific Islander
- Hispanic / Latino
- Other
- Prefer not to answer

*D4.*

Please tell us, are you now married, widowed, divorced, separated or never married?

- Prefer not to answer
- Separated
- Divorced
- Widowed
- Married
- Never Married

*D5.*

Do you have children?

- Prefer not to answer
- yes
- no

*D5.num.* How many children do you have?

- 1
- 2
- 3
- 4

Appendix 1: Fisch and Seligman Survey

5 or more

D6. Do you now, or have you ever, held the following assets?  
(please check all that apply)

	currently	in the past	never
An employer-sponsored 401(k), 403(b) or other defined contribution retirement plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An Individual Retirement Account (IRA) or Roth IRA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A SEP or SIMPLE type of IRA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An employer-sponsored pension plan with a defined benefit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Any other type of retirement savings account	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A deposit account (checking or savings) with a bank, thrift, or savings and loan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A full-service brokerage account	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A discount brokerage account	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A college savings account on behalf of a child	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A house, condominium or co-op	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

D7. When it comes to voting  
(please check all that apply)

	yes	no	rather not say
I voted in the last (2016) presidential election	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I voted in the 2012 presidential election	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I voted in the 2008 presidential election	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

D8. In terms of political ideology, I generally consider myself

- Strongly conservative
- Conservative
- Moderate

## Appendix 1: Fisch and Seligman Survey

- Liberal
- Strongly liberal
- Prefer not to answer

*D9.*

Please indicate your approximate annual household income

- less than 25,000 dollars
- 25,000 - 50,000 dollars
- 50,000 - 75,000 dollars
- 75,000 - 100,000 dollars
- 100,000 - 150,000 dollars
- 150,000 - 200,000 dollars
- 200,000 - 250,000 dollars
- more than 250,000 dollars
- Prefer not to answer

*D10.* Please indicate your highest educational level

- Completed some high school, but not a GED
- High School Graduate / GED
- Completed some college
- Associates degree or other 2 year college degree
- Bachelor of Arts or Science degree (4-year college graduate)
- Completed some graduate studies but not a degree
- Masters or two year Professional Degree
- Doctoral or Juris Doctorate Degree
- Prefer not to answer

*D11.*

Are you retired from your lifetime occupation?

- Yes

## Appendix 1: Fisch and Seligman Survey

- Partially
- No
- Prefer not to answer

*D12.* Please indicate your employment status

- Full-time student
- Not currently employed
- Employed part-time
- Employed full-time
- Self-employed
- Prefer not to answer

*REMARK.* If you have any comments or feedback or questions about this survey (or any of the particular questions), we invite you to please provide them here:

>>> ENDOFSURVEY<<<

## Appendix 2: Power Analysis and Sample Size

Power analysis offers an incremental way to think about data robustness.<sup>35</sup> Analysis suggested that an effective sample size of 660 would be large enough to generate 95 percent confidence in any detected difference that was 2.5-2.6 percent above or below the general surveyed population, across our three independent variables using as many as 30 independent variables. This was consistent with our expected approach for regression analysis. It however did require heading back into the field for a few more rounds of data collection.

Table 1: Power Analysis of Minimum Detectable Effects for Several Sample Sizes

<i>Dependent variables</i>	Surveyed N	Effective N	Independent variables	Power	Alpha	Delta	Rho2_p
<b>1</b>	500	250	35	0.8	0.05	3.17%	3.07%
	500	250	35	0.95		5.25%	4.98%
	500	330	30	0.8		2.39%	2.34%
		330	30	0.95		3.96%	3.81%
	758	500	30	0.8		1.58%	1.55%
		500	30	0.95		2.61%	2.54%
	1000	660	30	0.8		1.19%	1.18%
		660	30	0.95		1.97%	1.94%
<b>3</b>	500	250	35	0.8	0.05	4.44%	4.25%
				0.95		7.00%	6.54%
	500	330	30	0.8		3.35%	3.24%
		330	30	0.95		5.27%	5.01%
	758	500	30	0.8		2.20%	2.15%
		500	30	0.95		3.46%	3.35%
	1000	660	30	0.8		1.66%	1.64%
		660	30	0.95		2.62%	2.55%

Table Notes:

Definitions:

*Power*: Probability the study will detect a statistically significant effect, when one is present. So, 0.8, --> an 8 in 10 chance, 0.95 --> 19/20 chance, .99 --> 99/100 chance.

*Alpha*: significance level one is looking for to reject the null - default is five percent.

*Delta*: Minimum detectable effect size as a percent difference from the population mean - in a general t-test with a full-population consistent Standard Deviation in the treatment sample.

*Rho2\_p*: Effect size needed to reject null of no difference in sub-population means at specified confidence level & power.

<sup>35</sup> To calculate the final sample size that would be needed, we utilized routines built into the same statistical package that regressions were later run in, Stata (version 15.1 MP). At the time power analysis was done we had 550 survey responses. Because not all survey responders completed all sections of the survey, the effective sample size was roughly 490 observations, given the dependent and independent variables we estimated using at the time. Assuming some adjustment to our regression specifications we estimated that sample size (Effective N) would be no less than two thirds of collected N and that a final sample of roughly 660 would meet our needs. In fact, roughly 88 percent of those who initiated the survey completed it, well above the conservative 67 percent we used in our estimates at the end of phase two.

<https://www.stata.com/manuals13/pss.pdf>

<https://stats.idre.ucla.edu/other/mult-pkg/seminars/intro-power/>