The Needs and Wants in Financial Advice: Human versus Robo-advising

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Abstract

We use a broad survey to elicit investor needs and their satisfaction in the context of financial advice. We provide evidence that traditionally-advised individuals do not hire financial advisors mainly to maximize portfolio returns. They instead hire financial advisors to satisfy a broader set of needs. These needs include acquiring "peace of mind," having access to the opinions of an expert and delegating financial decisions. We also show the majority of investors do not know how much they pay for financial advice, but the miscalculation of the costs of financial advice are unlikely to drive the decision to hire financial advisors. Robo-advised investors are more interested in the financial performance of their portfolio. They also view robo-advising as an empowering tool that can contribute to their own self-improvement. Even robo-advised investors, however, value greatly the possibility to reach out and interact with humans. Our results provide novel evidence on why individual investors choose to hire financial advisors. They also inform on the optimal design of robo-advisers.

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Introduction

Financial advisors are ubiquitous in the US and all over the world. They represent a multi-billion dollar industry and account for the majority of individual investors mutual fund transactions. A common concern among those analyzing the performance of financial advisors is that they are rather expensive and often ineffective in helping their clients maximize their investment returns, see—among others—Foerster, Linnainmaa, Melzer, and Previtero (2017), Linnainmaa, Melzer, and Previtero (Forthcoming), Linnainmaa, Melzer, Previtero, and Foerster (2018), Chalmers and Reuter (2012).

The disconnect between the poor performance financial advisors deliver and the continued willingness of investors to sign up for advisory services raises the concern that investors value aspects of financial advice that are unrelated to the performance of their investment portfolios. These aspects are also likely to be intangible and difficult to measure using standard administrative data. Gennaioli, Shleifer, and Vishny (2015) highlight the importance of the role of trust, which describes the confidence in the financial advisor that is based—among others— on factors such as personal relationships, familiarity, personal connections, and communication. In their model, financial advice is similar to medicine. Investors have very little knowledge about how to invest in the same way patients have very little knowledge about how to get treated. Financial advisors are treated as money doctors who help investors make investment decisions and are trusted to do so, even if their advice is costly, generic, and not always in the investors' best interest.

Another—potentially complementary— hypothesis is investors do not fully understand how much they pay for their financial advisors (Linnainmaa, Melzer, Previtero, and Foerster, 2018). In many cases, advisors' compensation can be complicated and investors may be unable to estimate how much they pay for their advisory services and, as a result, overestimate their satisfaction with the service.

In this paper, we provide survey evidence on the wants and needs of individuals when they hire financial advisors. We provide evidence that traditionally-advised individuals do not hire financial advisors mainly to maximize portfolio returns. They instead hire financial advisors to satisfy a broader set of needs. These needs include purchasing "peace of mind," having access

to the opinions of an expert and delegating financial decisions. We also show the majority of investors do not know how much they pay for financial advice, but the miscalculation of the costs of financial advice are unlikely to drive the decision to hire financial advisors as the majority of investors overestimate how much they pay for financial advice. Also, we do not find any relation between the perceived cost of financial advice and investor satisfaction.

Robo-advised investors are more interested in the financial performance of their portfolio. They also view robo-advising as an empowering tool that can contribute to their own self-improvement. Even robo-advised investors, however, value greatly the possibility to reach out and interact with humans.

Our sample includes approximately 3,000 individuals and comprises clients of human financial advisers, of robo-advisers, as well as unadvised individuals. The sample is also representative as it elicited responses from customers representing a large number of financial management houses. The survey is extremely detailed and contains in excess of 200 questions covering different domains. The main features of the survey can be summarized as follows.

First, and crucial for the questions posed in this paper, the survey dissects the process of providing financial advice into 24 activities or "needs." These needs cover various aspects ranging from budgeting and risk-management to mediating financial controversies between spouses and having a personal connection with the advisor. In addition to asking each respondent the importance of each need, the survey asks the relative weighting of the needs the investors deem important and—for the advised investors— it elicits whether each need is satisfied by the human or robo-advisor. The survey also asks the subjects what emotions they experience—both positive and negative—when they interact with their advisor.

Second, the survey asks traditionally-advised investors whether they would be interested in adopting robo-advising in the future, and what would be the main reasons for not adopting robo-advising. It asks robo-advised investors whether they would be interested in adopting human advising in the future, and what are the main reasons for not adopting human advising. Lastly, it asks unadvised individuals whether they hired human financial advisors in the past, whether they would be interested in adopting human advising in the future, and what are the main reasons for not adopting human or robo-advising.

Third, the survey collects a host of additional information, including investors' demographic

characteristics, their financial knowledge and sophistication, the type and frequency of interactions they have with their financial advisor, and the payment structure underlying the client-advisor relation.

The first part of the paper provides novel facts about investor needs for traditionally-advised, robo-advised and unadvised individuals. We classify investor needs into five categories: the need for knowledge, trust, personal improvement, delegation, and investment performance. Across all investors, the most important need is trust, followed by self-improvement and knowledge. The least important "need" is investment performance. When we decompose the analysis into traditionally-advised, robo-advised and unadvised investors, we find the first two behave very similarly along all dimensions. Unadvised investors are different in that they value less trust and more the need of self-improvement.

We then relate investor needs to the perceived value of advice, which we interpret as investors' subjective utility of receiving advice. In univariate cross-sectional relations, we find a very strong and positive relation between the need for trust and the overall value of advice. That is, individuals with a higher need for trust value financial advice more. We find the same for knowledge, personal improvement and delegation. We instead do not find a clear monotonic pattern between the perceived value of advice and investors' "need" for portfolio performance.

We complement the univariate cross-sectional relations with multivariate linear regressions estimating the joint relation between investor needs and value of advice, controlling for demographic characteristics such as age, gender, race, risk-tolerance, technological attitude levels, investable assets, as well as the length of the advisor-client relation. Traditionally-advised investors value the need to acquire knowledge, trust and delegation and do not value maximizing their investment returns. The results for robo-advised investors are different. These investors do not value having access to expert opinions and do not have a high need for trust. They instead view robo-advising as an empowering tool that can contribute to their own self-improvement and they value the performance of their investment portfolio. For unadvised investors, the value of a prospective financial advisory relation is positively related to the need to acquire knowledge and delegate financial decisions.

For advised investors, our survey also elicits whether investor needs are satisfied by their current advisory relation as well as the emotions they experience when they interact with their

human or robo-advisers. For both types of investors, we find that the factors significantly related to the value of advice are the satisfaction of trust, self-improvement, and delegation. On the other hand, knowledge and the satisfaction of investment needs do not appear significant. Positive and negative emotions are also very strongly related to value of advice. Both regressors have a very large economic and statistical effects. Economically, negative emotions looms larger than positive ones. The negative emotions regression coefficients are almost three times as large as the ones on positive emotions—in absolute terms.

Taken together, these results show that individuals do not care about maximizing their investment performance when they hire a financial advisor. If anything, they are more concerned about purchasing "peace of mind."

We complete the picture by analyzing the perceived costs of financial advice. We find the large majority of investors do not know how much they pay for financial advice, with a few investors responding they pay unrealistically little and many investors responding they pay unrealistically large amounts for advice. The miscalculations of the costs of financial advice, however, are unlikely to drive the decision to hire financial advisors as 1) the majority of investors overestimate how much they pay for financial advice and 2) we do not find any relation between the perceived cost of financial advice and either perceived value of advice or overall satisfaction with financial advice.

In the second part of the paper, we analyze which traditionally-advised and unadvised investors are more likely to consider signing up for robo-advising. Unlike the results for value of advice, we find individuals interested in acquiring knowledge and improving their investment allocation functions are the most likely to consider robo-advising. On the other hand, individuals that wish to completely delegate their investment decisions, and therefore have a need for trust, are more reluctant to consider robo-advising. These results are robust to controlling for demographic characteristics.

When we focus on the needs satisfied, we find instead that almost all the coefficients on the needs variables are insignificant, suggesting that the quality of traditional advice is not strongly related to investors' willingness to try robo-advising. The only exception is the regressor related to the positive emotions experienced when interacting with the financial advisor, that is very significant and strongly negatively related to the willingness to adopt robo-advising.

We ask both traditionally-advised and unadvised investors the main reasons for not adopting robo-advising. For traditionally-advised, the main obstacle to robo-advising is that individuals want to be able to speak to a person about their finances. The second and third reasons, are that individuals want their money managed by humans and they do not trust computer algorithms. The remaining reasons are instead that individuals want to be in control and think they are better off investing money by themselves. Because algorithmic-aversion is likely a function of age, we repeat the analysis for different age groups. The results suggest that the underlying motives for not adopting robo-advising across various age groups is algorithmic aversion. However, algorithmic aversion is much less present in the younger generations and more dominant on the older ones. Only 40% of the advised investors in the first age quartile (average age of 39 years) choose it as one reason for not adopting robo-advising, while almost 65% of the advised investors in the fourth quartile (average age of 74 years) selects it as a prominent reason.

Unadvised investors are different. Algorithmic-aversion is a minor concern for unadvised investors, which seem to be more concerned with being in control of how their wealth is invested and having direct control over it. A second motive is that unadvised individuals think they need to be tech-savvy in order to use robo-advising, not realizing many robo-advisers do not require any technological skills to operate.

One of the main reasons traditionally advised investors do not switch to robo-advising is the inability to interact with a human. Many robo-advisers, however, are hybrid in nature, in that they allow investors to access either dedicated human advisors or human advisors that change across different interactions. In both univariate and multivariate regressions that control for investors' demographic characteristics we find that having access to human advisors increases significantly the perceived value of advice for robo-advised investors. We also find a positive relation between value of advice and the ability to meet consistently with the same dedicated advisor or a rotating advisor among a restricted group.

A number of studies have shown that advisor-related products underperform unadvised products. Bergstresser, Chalmers, and Tufano (2008) and Christoffersen, Evans, and Musto (2013) show brokered mutual funds underperform unbrokered mutual funds. Chalmers and Reuter (2012) show that advised investors underperform Target Date Funds (TDFs), mainly because they charge higher fees. Hackethal, Haliassos, and Jappelli (2012) show that advised accounts

perform worse than self-managed accounts. Finally, Linnainmaa, Melzer, Previtero, and Foerster (2018) show that the higher risks taken by advised investors do not compensate for the higher costs of advice. We contribute to this literature by showing investors do not focus on financial performance when they enter financial advisory relations and the satisfaction of other needs is more important. We also show that investors are, in many cases, unaware of how much they pay for advice, but that the fees paid are unrelated to the customers' perceived value of advice.

Our results also contribute to understanding the role of trust in financial markets. Gennaioli, Shleifer, and Vishny (2015) develop a theoretical model highlighting the role of trust in the client-advisor relation and argue more trusting investors should be willing to take more risk in financial markets. Our results test one of the key mechanisms in their model. At the extensive margin, we show advised investors are more risk-tolerant. At the intensive margin, we find those investors who rank higher in their satisfaction for the need for trust are also more risk-tolerant. Taken together, these results suggest the trust instilled by financial advisors allow investors to take more risks.

Relatedly, Guiso, Sapienza, and Zingales (2008) study the role of trust in financial institutions and stock market participation. They show less trusting individuals are less likely to buy stocks and, conditional on buying stocks, they are likely to buy less of it. D'Acunto (2017) show causal evidence that exposure to anti-market rhetoric leads individuals to invest less often and less money in risky opportunities. D'Acunto, Prokopczuk, and Weber (Forthcoming) show households in counties where historical antisemitism was higher distrust the financial sector more, documenting that a cultural externality such as historical antisemitism can have real economic effects, such as reducing wealth accumulation in the long-run. Our results show that trust is the single most important aspect individuals care about, in employing a financial advisor. Mullainathan, Noeth, and Schoar (2012) find that advisors cater to investors' biases and encourage them to chase past returns and purchase actively managed mutual funds. Finally, Bhattacharya, Hackethal, Kaesler, Loos, and Meyer (2012) show individuals rarely follow unbiased—and beneficial—financial advice. Our results show trust plays a very large role in the client-advisor relation. Trusting individuals may be easily induced to follow advice that is detrimental to their own finances by their advisor. To the contrary, they may not follow beneficial advice simply because they do not trust the source of it.

Our results also contribute to the nascent literature on robo-advising. D'Acunto, Prabhala, and Rossi (Forthcoming) and Rossi and Utkus (2018) provide evidence on the effectiveness of various forms of robo-advising for individual stocks and mutual fund investors, respectively. Our results show that, even for robo-advised investors, having access to human advice is important and positively related to customer satisfaction and the perceived value of advice.

1 The Survey

The survey covers a total of 2,994 individuals. The sampling was conducted to obtain a maximum of 1,750 traditionally-advised investors, all with investable assets between $100K and $5M. To increase the representativeness of the sample, the survey targeted a minimum of 120 investors with between with $500K to $1M in investable assets and a minimum of 120 investor with $1M to $5M in investable assets. The minimum quota of robo-advising users was 750: 250 robo-advised investors with assets between $5K and $5M investors—chosen across all platforms—and 500 investors enrolled in the hybrid robo-advisory service from Vanguard. Finally, the survey targeted a minimum of 500 unadvised investors with investable assets between $5K and $5M. The respondents completed the survey between September 11^{th} and September 28^{th}, 2018.

The survey was designed to be broad in terms of the financial advisory firms covered. The final sample of traditionally-advised investors contains 1,744 individuals, representing 367 traditional financial advisors. The left panel of Table 1 reports the most represented financial advisors among the survey respondents. The most represented is Fidelity, the clients of which represent 14.4% of the surveyed individuals, followed by Edward Jones with 8.1%, Ameriprise with 7.9%, Merrill Lynch with 6.6%, and Schwab with 5.6%. The top 10 firms account for approximately 62% of the respondents.

The total number of robo-advised investors is 746, representing 46 robo-advisors. The right panel of Table 1 reports the most represented robo-advisors. The most represented is Vanguard PAS, the clients of which represent 65.1% of the surveyed individuals. This is not surprising as 2/3 of the investors were designed to be Vanguard PAS clients—see above. The second most represented robo-advisor is Fidelity Go, the clients of which represent 9.1% of the clients, Acorns with 3.5%, Betterment with 2.7%, and E*TRADE with 2.4%. This sample is more concentrated.

The top 10 firms account for approximately 89% of the respondents.

The survey comprises an initial screener eliciting gender, age, zip-code, investable assets, and the type of advice received—traditionally-advised, robo-advised, or unadvised. Depending on the type of financial advice, the survey differs slightly in the questions asked.

For the traditionally-advised, the survey asks a number of questions related to the financial context of the individuals. These include, among others, the duration of the relation with the financial advisor, the contact frequency with the financial advisor and the channel — phone, email, etc.... The survey also asks the type of services received from the financial advisor, the payment structure, and the motivation for seeking financial advice. Finally, the survey asks traditionally-advised investors whether they have ever used robo-advising, whether they would be interested in adopting robo-advising in the future, and what would be the main reasons for not adopting robo-advising. The corresponding questions for robo-advised investors are very similar, with the exception of the last few questions that ask robo-advised investors whether they have ever used human advisors, whether they would be interested in adopting human advising in the future, and what would be the main reasons for not adopting human advising. Finally, for unadvised investors this section of the survey only ask whether they hired human financial advisors in the past, whether they would be interested in adopting human advising in the future, and what would be the main reasons for not adopting human advising. It then asks the same questions with respect to robo-advising.

The second part of the survey dissects the process of providing financial advice into 24 activities or "needs." These needs cover various aspects ranging from budgeting and risk-management to mediating financial controversies between spouses and creating a personal connection with the client. In addition to eliciting how important each need is to the investor, the survey also asks the investors to provide a relative weighting of the various needs. An additional set of questions also elicits whether each need is satisfied by the human advisor or the robo-advisor.

The third part of the survey is common to all investors. The survey asks questions related to confidence, knowledge and risk-tolerance in the realm of financial investing. It also asks the subjects how comfortable they are with new technologies and whether they commonly do online shopping, online banking, and other online activities. This part of the survey also asks the subjects what are the emotions they feel when they interact with their advisor.

The last part of the survey elicits demographic characteristics, such as the level of education, whether the individual is employed, the household income, and the type of monthly financial obligations such as student loans, mortgages, etc... The final few questions relate to the number of dependents, the marital status and the ethnicity of the investor. We report the details of the survey, including all the questions, in the Online Appendix.

2 Investor Characteristics

Our sample comprises at total of 2,994 individuals, 52% of which are females. The surveyed individuals were 58 years of age, on average, with a minimum and a maximum of 19 and 93, respectively. Table 2 reports some of the main summary statistics related to individuals income, assets, and advisor relation. We compute the results separately for traditionally-advised investors, robo-advised investors—that include Vanguard's PAS investors— and unadvised investors. These three groups comprise, respectively, 1,744, 746, and 504 individuals.

The majority of investors make between $50K and $100K per year in income. We do not find particularly large differences across the three groups of individuals, with the exception that robo-advised individuals have a higher income in the upper-tail of the income distribution, compared to traditionally-advised investors and that unadvised investors have a lower annual income, on average, compared to the other two groups.

The distribution of retirement plan values is similar across the three groups, with the exception that there is a smaller percentage of robo-advised investors that do not have a retirement plan, compared to traditional and unadvised investors.

Investable assets is where we start seeing some significant differences, as 55% of the unadvised have less than $250K in assets. The percentage for traditionally and robo-advised investors is 28% and 32%, respectively. We find equally-significant differences at the other end of the spectrum. Almost 50% of the Robo-advised have more than $500K in investable assets. The corresponding value for traditionally-advised investors is 43%, but it is 23% for unadvised investors. The percentage of assets held with the advisor is similar across the traditionally and robo-advised.

The interaction frequency is where we also find some differences: 23% of the robo-advised investors interact with their advisor weekly. The value for traditionally-advised in only 3%. At

the monthly frequency, we find the same: 35% for robo-advised and 24% for traditionally-advised. The relation is inverted at lower frequencies. The bulk of the traditionally-advised investors meets quarterly, 51%, and annually, 22%, while the corresponding values for robo-advised are much lower, at only 34% and 8%, respectively.

The relationship length across traditionally- and robo-advised individuals is very different. This is expected, as the majority of the robo-advisers are fairly recent: 60% of the robo-advised clients have used have been with their robo-advisor for less than 6 years, while 66% of the traditionally-advised clients have been with their human financial advisor for more than 6 years.

Given the differences in individual characteristics, we make sure to include controls when computing our results.

3 Facts about Investor Needs

The survey includes 24 questions related to the needs investors want to have satisfied when it comes to investing. In each case, the individual rates whether he/she agrees with each statement on a scale from 1 to 5, ranging from *strongly disagree* to *strongly agree*. We group the questions into five groups. The first, *knowledge*, comprises 6 questions: whether the customer needs an expert perspective, a custom financial plan, online access, expert access, expand his/her knowledge, as well as proactive outreach from an advisor. The second, *trust*, also comprises 6 questions: whether the customer needs to be reassured, a personal connection with the advisor, transparency in pay, transparency in account operations, protection, and whether trust is an important component in the client-advisor relation. The third, *personal improvement*, contains four questions related to personal self-improvement and contains the need for the investor to take charge, have control, meet financial goals and be on track. The fourth, *delegation*, comprises four questions related to considering a financial advisor to delegate financial decisions to, to mediate financial decision-making between spouses, obtain financial freedom and help the financial conditions of the survivors. The final group, *investment*, contains four questions regarding the practical needs generally satisfied by the financial advisor: maximize returns, balancing the portfolio, deal with unexpected events and protect the invested capital. We average the scores across each subquestion to construct the overall value of each group.

We report summary statistics for each aggregate group in Table 3. Starting from the need for knowledge, we find that both traditional and robo-advised investors behave very similarly. Unadvised investors, on the other hand, are much less interested in this need: 19% of the surveyed population disagrees with this need being important—compared to 2% and 3% for traditional and robo-advised investors—and only 13% strongly agree, compared to 23% and 28%.

The need for trust category behaves similarly. The distribution is virtually identical for traditionally- and robo-advised. Unadvised investors, are instead less interested in this need. The same is true for the need of self-improvement, the need for delegation, and the need for investment performance. Overall, we find that all advised investors report very similar needs as important.

The survey also asks the investor to allocate 100 points across all the needs they believe are important. We add the score assigned to each individual need across the categories we have constructed and report the results in Figure 1. Subfigure (a) reports results across all investors. The most important need is Trust, that has a weight of 27%. The next two needs are self-improvement and knowledge, with relative weights of 22% and 20%, respectively. Interestingly, we find that investment needs have the lowest relative weight of approximately 12%, indicating that investors are not particularly interested in satisfying these needs.

Subfigures (b) through (d) repeat the analysis for the traditionally-advised, the robo-advised, and the unadvised. Traditionally-advised and robo-advised have similar need rankings. Unadvised are instead different. They value self-improvement more than trust. They are also much less interested in acquiring new knowledge and having access to expert opinions, compared to advised investors. Delegation is also less important to them.

4 Investor Needs and the Value of Financial Advice

In this section, we first relate investor needs to investors' perceived value of advice for traditionally-advised, robo-advised, and unadvised investors. We then relate the satisfaction of these needs to the value of advice.

4.1 Customer Needs and Value of Advice

We first provide univariate results relating traditionally-advised investor needs to the perceived value of advice. The results are reported in Figure 2. For each aggregate need, we group individuals into four quartiles and compute the average perceived value of advice. There is clearly a very strong and positive relation between the need for knowledge, trust, personal improvement and delegation, and overall value of advice. For these need variables, the perceived value of advice averages 4.2 for those individuals with low needs to 4.8 for those with high needs.

Investment needs are different. We do not find a positive and strong relation between investment needs and value of advice. The first three groups have very similar value of advice and only the high-investment-need individuals value advice significantly more.

The univariate plots in Figure 2 do not control for investor characteristics. In Table 4, we estimate the joint relation between investor needs and value of advice, controlling for demographic characteristics such as age group quartiles, a gender dummy, a white race dummy, a dummy for the investor risk-tolerance, technological attitude levels, the investable assets, as well as the length of the advisor-client relation—measured in years.

The table contains six columns. The first two columns focus only on traditionally-advised investors. The remaining four columns focus on robo-advised and unadvised investors. For the latter group, the dependent variable is what would be the perceived value of engaging into a client-advisor relation. The first column contains only the needs regressors, while the second contains also demographic controls. The same is true for columns 3 through 6.

Starting from the first column, the results show that the need to acquire knowledge, trust, and delegation are very strongly related to the value of advice. The need of self-improvement is weakly positively related while the investment performance need is negatively related to the value of advice. Once we include investor characteristics in Column 2, the coefficient on self-improvement becomes insignificant and the one on investment performance is reduced in half and becomes much less significant. These results suggest that, if anything, traditionally advised investors care about satisfying the need to acquire knowledge, trust and delegation, rather than maximizing their investment performance, when they hire a financial advisor.

Among the control variables, we find the value of advice increases with age and risk-tolerance.

We also find white and females value more financial advice. The length of the investor-advisor relation is also positively related to perceived value. Finally, we do not find any relation between technological attitude, investable assets and the value of financial advice.

Columns 3 and 4 repeat the analysis focusing on robo-advised investors. Robo-advised investors also associate the value of robo-advising to the need to delegate their financial decisions. Unlike traditionally-advised investors, however, they are not particularly interested having access to expert opinions and do not have high needs for trust. They are instead more interested in the self-improvement and the investment performance of their portfolio. For this group, very few control variables explain the variation in value of advice. One exception being the white-race dummy, which is positively related to the perceived value of advice.

Columns 5 and 6 repeat the analysis for unadvised investors, whose value of advice is positively related to the need to acquire knowledge and entrust someone else with their money. The need to maximize financial returns is significant only in the specification that does not include controls. Unlike traditionally-advised investors, the perceived value of advice decreases with age, rather than increasing, suggesting that those self-selecting into being not advised become more and more convinced of their choice as they age. Finally, we find that risk-tolerance is positively related to the value of financial advice.

Comparing the constant coefficients in Columns 2, 4, and 6, we find that—on average—robo-advised investors seem to be the most satisfied with the product. The constant captures the average satisfaction for investors in the first age quartile, that are males, white, have low risk-tolerance, low tech-attitude, a rather short relation with their advisor, have low-levels of investable assets and, have need variables set to zero. For the traditionally-advised, the constant equals 2.5, while it equals 2.9 for robo-advised investors and only 1.6 for unadvised investors, suggesting a rather large gap between the perceived value of advice for those investors that receive advice and those that don't.

4.2 Individual Need Satisfaction and Value of Advice

The results reported so far relate to the needs investor deem important. For human and robo-advised investors, we also have information regarding the satisfaction of such needs as well as the emotions they feel when interacting their financial advisor. We have 16 emotion dummies

related to how investors behave. The first eight are positive emotions: confident, connected, entertained, happy, proud, satisfied, secured and respected. The remaining are instead negative emotions: afraid, angry, anxious, worried, upset, bored, sad, disappointed. We construct two aggregate measures of positive and negative emotions by simply summing the positive and negative dummies.

The results are reported in Table 5. For traditionally-advised investors, the components significantly related to the value of advice, both with and without control variables, are the satisfaction of trust, self-improvement, and delegation. On the other hand, knowledge and the satisfaction of investment needs are not closely related to investors' value of advice. Positive and negative emotions are very strongly related to value of advice. Both regressors have a very large economic and statistical effect. Economically, negative emotions loom larger than positive ones. The coefficient is almost twice as large in absolute value (-1.098 vs 0.576). The results for the control variables are very similar to the ones reported in Table 4.

The results for robo-advised investors are similar. The satisfaction of the need for knowledge and trust is positively related to value of advice. At the same time, satisfying the need for delegation is not as related to value of advice as it is for traditionally advised investors. Also, for robo-advised investors, positive and negative emotions are very strongly related to overall value of advice and have similar economic magnitudes, in contrast with the traditionally-advised investors.

Overall, the results reported so far suggest that, for traditionally-advised investors, value in financial advice is more closely related to the need to delegate financial decisions and gain peace of mind. For the robo-advised it is more about knowledge. In both cases, however, maximizing investment returns seems second order. Also, the emotions deriving from interacting with the advisor have a very large impact on the perceived value of advice.

4.3 The Costs and Benefits of Financial Advice

Linnainmaa, Melzer, Previtero, and Foerster (2018) find investors do not benefit from financial advice, because the increase in risk-taking associated with having a financial advisor does not compensate for the fees paid to the financial advisor. The theoretical underpinnings of Linnainmaa, Melzer, Previtero, and Foerster (2018) are in Gennaioli, Shleifer, and Vishny (2015). The

latter proposes a theoretical model where advised investors are willing to take large risks when advised because having a financial advisor decreases the investors' anxiety. Below, we discuss and provide empirical tests for the key mechanisms in Gennaioli, Shleifer, and Vishny (2015).

We start with the relation between financial advice and risk-tolerance. Linnainmaa, Melzer, Previtero, and Foerster (2018) show that advised investors take more risk. They, however, are not in the position to disentangle the underlying mechanism, because they do not observe investors' risk-tolerance and trust level. In Figure 3, we show the mechanism envisioned by Gennaioli, Shleifer, and Vishny (2015) is indeed in effect both at the extensive margin as well as the intensive margin. Subfigure (a) of Figure 3 shows the effect at the extensive margin. Advised investors are more risk-tolerant, compared to unadvised investors. Subfigure (b) of Figure 3 presents the results at the intensive margin. We group the surveyed individuals in terciles on the basis of the satisfaction of the aggregate trust need and compute the average risk-tolerance within each group, we find a markedly strong and positive relation.

Because the increase in risk-taking does not compensate for the fees paid to the financial advisor,Linnainmaa, Melzer, Previtero, and Foerster (2018) hypothesize that either investors do not care exclusively about maximizing their investment returns, or they are unaware of the costs of advice. We argue below that the first hypothesis aligns more with the data.

The results reported so far in Sections 4.1 and 4.2 suggest portfolio maximization is not a key concern to investors, who seem instead more interested in obtaining peace of mind and unloading their financial decision on their advisor. We now provide evidence that investors are likely unaware of the costs of advice, but these miscalculation are unlikely to be the main driver for the decision to hire a financial advisor.

A portion of the survey is dedicated to the costs of financial advice. The first question relates to how investors pay for their advisor. The majority of traditionally-advised investors (47%) pay a fee computed according to the assets under management, followed by 16% that pay per transaction and 15% that pay an annual fee unrelated to their assets. Finally, 13% of the investors do not know how they pay for the advice. The percentages are slightly different for robo-advisors, where 55% of the customers pay as a percentage of the assets under management, 27% an annual fee unrelated to assets and 6% pay a fee for every transaction. The number of individuals that do not seem to know how much they pay is rather small, only 6%.

The second—and more important question—asks investors to estimate the fees they pay as a percentage of assets managed. For traditionally-advised investors, we find that only 29% of the customers are willing to give quantitative estimates. In many cases, these estimates are very far from being realistic. The average value is 6.71%, much larger than what we would expect. Also, we find an unrealistically large dispersion in fee estimates. The 1^{st}, 5^{th}, 25^{th}, 50^{th}, 75^{th}, 95^{th}, and 99^{th} percentile of the distribution equal, respectively, 0.01%, 0.25%, 1.00%, 1.20%, 2.50%, 50%, 99%, respectively.

For traditionally-advised investors, we find that only 41% of the customers are willing to give quantitative estimates. In many cases, these estimates are also rather unrealistic. The average value is 5.36%, much larger than what we would expect. Also, we find a rather large dispersion in fee estimates. The 1^{st}, 5^{th}, 25^{th}, 50^{th}, 75^{th}, 95^{th}, and 99^{th} percentile of the distribution equal, respectively, 0.00%, 0.02%, 0.25%, 0.30%, 1.00%, 40%, 90%, respectively.

Overall, these results provide evidence that investors do not know how much they pay for financial advice, but—if anything—they think they are paying more than they actually are. To address whether the fees paid by the advisor has any impact on investors' value of advice, we regress—for both traditionally-advised and robo-advised investors—the value of advice, the trust in financial advice, and the overall satisfaction on the fees paid. In all cases, we find the coefficient on fees is insignificant and find little-to-no relation between the fees paid and the value of advice.

Taken together, these results suggest it is unlikely individuals hire financial advisors because they are unaware of how expensive they are.

4.4 Do Investors Know What they Want?

Because we have both investor needs and satisfaction, we can test whether individuals can clearly spell out and aggregate their needs. Table 5 relates the overall satisfaction and the value of advice to the satisfaction of investor needs. These needs, however, are not weighted by how important they are to each individual. Intuitively, if individuals were able to externalize how important each need is, we should be able to explain more of their overall satisfaction by weighting the satisfaction of each need by its importance. In Table 6, we repeat the exercise in Table 5, but we scale the satisfaction of each need by its importance. To keep the computations simple, we simply

multiply the score associated with each need with the score associated with its satisfaction.

While comparable, the coefficient estimates in Table 5 are different from the ones in Table 6. They are quantitatively smaller, partly because the underlying variables are now larger, but they are also less statistically significant. Also, and more importantly, the R^2's in Table 6 are generally smaller than the ones in Table 5. For traditionally-advised investors, the R^2 in the first column is 0.361 in Table 5, compared to 0.332 in Table 6. The corresponding R^2 for value of advice in the third column is 0.383 in Table 5, compared to 0.336 in Table 6.

These results indicate investors are unlikely to think at their overall satisfaction as the overall weighted average of needs they have satisfied. Another possibility is that the investors' overall satisfaction comprises aspects not included in the survey. In future research, it could be interesting to assess what weighting schemes perform better than simple unweighted averages.

5 Robo-Advising Adoption by Traditionally-Advised and Unadvised investors

The results reported so far highlight emotional components and non-financial needs have a very large impact on customers' perception of value deriving from advice. In what follows, we analyze what needs (satisfied and not satisfied) relate to the propensity of traditionally advised investors and unadvised investors to adopt robo-advising. The likelihood of adopting robo-advising is measured on a scale ranging from one to four, one being very unlikely to try robo-advising and four being very likely.

We start by presenting in Figure 4 simple univariate plots relating the needs of traditionally-advised investors to their propensity of adopting robo-advising. Unlike the results for value of advice in Figure 2, most of the emotional needs variables (trust, delegation, and self-improvement) are only weakly related to the propensity to adopt robo-advising. We instead find a positive and significant relation for the need to acquire knowledge and the need to improve investment performance. Take the latter case as an example. Investors in the lowest quartile have an average propensity value of 1.4 (out of 4), compared to an average propensity of 2.1 (out of 4) for the highest quartile, 50% larger.

We present the multivariate regression results that include demographic controls in Table 7. The first column does not include demographic controls. As suggested by the univariate plots, individuals interested in acquiring knowledge and improving their investment allocation functions are the most likely to consider robo-advising. On the other hand, individuals that wish to completely delegate their investment decisions, and therefore have a need for trust, are more reluctant to consider robo-advising. The need for personal improvement does not seem to play a role in the propensity to sign up for robo-advising. The second column includes demographic controls. The coefficients on the needs variables are generally reduced by half, but maintain their statistical significance, except for the coefficient on trust, which becomes insignificant. The control variables have the expected signs. The older the investor and the more reluctant he/she is about trying robo-advising, while the self-declared technological attitude is positively related to the willingness to try robo-advising. Finally, risk-tolerance has no impact the willingness to adopt robo-advising.

The results for unadvised investors are similar. The propensity to try robo-advising is positively related to the need for knowledge and the need to improve investment decisions. These effects are weakened by the addition of demographic control variables. Only the need to acquire and expand knowledge remains significant. The effect of the control variables follow intuition: older individuals are more reluctant to adopt robo-advising even when we control for tech attitude, that is instead positively related to robo-advising adoption.

The results reported so far relate investors' propensity to adopt robo-advising to their needs. In Table 8, we work only with traditionally-advised investors, for which we have satisfaction scores. When used without controls, both satisfaction and emotional scores explain the propensity to adopt robo-advising. Once we include demographic controls, however, almost all the coefficients become insignificant, suggesting that the quality of traditional advice is not strongly related to investors' willingness to try robo-advising. The only exception is the positive emotions dummy that is significant at the 1% level and strongly negatively related to the willingness to adopt robo-advising.

6 What are the Main Reasons for not Having a Human or Robo-advisor?

For the traditionally-advised, we have a number of direct questions related to why individuals do not currently use robo-advising. Investors are free to choose one more of the following reasons: 1) the fees are too high; 2) I can make more money doing it myself; 3) It's not worth the time; 4) I don't have enough money to get started; 5) I want to make my own investing decisions; 6) I used to use this type of platform, but I didn't like the experience; 7) I don't trust a computer algorithm to manage my money; 8) I'm not comfortable using technology; 9) I want a real person to manage my money, not a computer; and 10) I want to be able speak to a real person abut my finances. The results are reported in the top-left panel of Figure 5. The main obstacle to robo-advising is that, indeed, almost 60% of the respondent want to be able to speak to an individual about their finances. The second and third reasons, chosen by 52% and 33% of the investors, respectively, are that individuals want their money managed by humans and they do not trust investment algorithms. The remaining reasons are instead that individuals want to be in control and are better off investing money by themselves.

The results in Tables 7 and 8 suggest there is a very strong and negative relation between investors' age and the propensity to adopt robo-advising. To see whether the underlying motives for not adopting robo-advising are different across different age groups, we repeat the analysis reported in the top-left panel of Figure 5 splitting the results by income quartiles. The results, reported in Figure 6, suggest the underlying motives for not adopting robo-advising across various age groups is algorithmic aversion. However, algorithmic aversion is much less present in the younger generations and more dominant in the older ones. Only 40% of the advised investors in the first age quartile (average age of 39 years) choose it as one reason for not adopting robo-advising, while almost 65% of the advised investors in the fourth quartile (average age of 74 years) select it as a prominent reason.

The survey asks the same questions to the investors that are not advised. As reported in the top-right panel of Figure 5, the results show that algorithmic-aversion is a minor concern for un-advised investors. Unadvised investors seem to be more concerned with being in control

of how their wealth is invested and having a direct control over it. A second motive is that unadvised individuals think that they need to be tech-savvy in order to use robo-advising, not realizing that many robo-advisers do not require tech-savviness.

For the robo-advised, we have a number of direct questions related to why investors do not have a human advisor instead. investors are free to choose one more of the following reasons: 1) The fees are too high; 2) I can make more money doing it myself; 3) Not worth the time; 4) I don't have enough money to get started; 5) I want to make my own investing decisions; 6) I used to have a financial advisor, but I didn't like the experience; 7) I couldn't trust someone else with my money; 8) I'm unsure how to find an advisor/where to begin.

The results for the 8 variables are reported in bottom-left panel of Figure 5. The main reason investors choose robo-advising over human advisors are the high fees charged by human advisors. Among the remaining reasons are that investors want to maintain control of their finances (19%) and that they used to have a human financial advisor in the past and were not satisfied with it (15%).

Unadvised investors, the results of which are reported in the bottom-right panel of Figure 5, have views similar to those of robo-advised investors. They perceive human advisors as very expensive and they want to be in control. Other important reasons for unadvised investors not to use human advisors is the lack of trust and the idea that they can invest better by themselves.

These results highlight the potential challenges for robo-advising adoption. Traditionally advised investors perceive the role of a human as crucial in the financial-advisory relation. They also doubt that they are capable of using a robo-advisor and they doubt that algorithms can invest their money more effectively than a human, a concern also expressed by unadvised individuals. Algorithmic aversion, however, is less and less of a concern among younger generations.

7 Is the Human Touch Important for Robo-advising?

One of the main reasons traditionally advised investors do not switch to robo-advising is the inability to interact with a human, when it comes to making financial decisions. Many robo-advisers, however, are hybrid in nature. They allow investors to access either dedicated human advisors or human advisors that change at different interactions. Out of the robo-advised in-

vestors, we have that some 62% of them can talk to human advisors, but do not do it often; 27% of the investors can and do talk regularly with their advisors; and the remaining 11% of investors cannot talk to humans or do not know whether they can.

Of the robo-advised investors that can reach out to human advisors, 38% always speak to the same investor, 30% speak to a restricted group of human financial advisors, while the rest talk every time to a different person.

In the top panel of Figure 7, we relate investors value, overall satisfaction, and overall trust in their robo-advisory service as a function of whether they can interact human advisors: "Group_1" does not have access to an advisor; Group_2 has potentially access, but does not do it often. Finally, Group_3 regularly talks to a human advisor. We find that having regular contacts with human advisors is positively related to investors perception of value, overall satisfaction and trust in the robo-advisory service.

In the bottom panel of Figure 7, we relate the type of human interaction to investors value, overall satisfaction, and overall trust in their robo-advisory service. Group_1 does not have access to the same advisor over time; Group_2 has access to a restricted pool of human advisors, while Group_3 has access to the same human advisor every time. Being able to interact with the same advisor or advisors from a restricted pool is positively related to investors perception of value, overall satisfaction and trust in the robo-advisory service.

Certain demographic characteristics such as age and technological attitudes, among others, can be potentially related to the importance investors attribute to interacting with a human. We present in Table 9 multivariate regression evidence that control for these factors. The dependent variable is the value from receiving robo-advising. The results are strongly significant for the dummy indicating whether the customer regularly talks to an advisor. The two dummies for whether the client talks to a restricted pool of advisors or always the same advisor are also very significant. Economically having access to always the same advisor increases the overall value of roboadvising by 0.5, on a scale from 1 to 5. The effect of interacting multiple humans within a restricted group is about half, and equals 0.23.

8 Conclusions

We use a broad survey to elicit investor needs and their satisfaction in the context of financial advice. We provide evidence that traditionally-advised individuals hire financial advisors largely to satisfy needs other than portfolio return maximization. These needs include acquiring "peace of mind," having access to the opinions of an expert and delegate financial decisions. We also show the majority of investors do not know how much they pay for financial advice, but the miscalculation of the costs of financial advice are unlikely to drive the decision to hire financial advisors. Robo-advised investors are instead more interested in self-improvement and the financial performance of their portfolio. These traits are also prevalent among the traditionally-advised investors inclined to switch to robo-advising, in addition to their technological attitude. Even robo-advised investors, however, value greatly the possibility to reach out and interact with humans. Our results provide novel evidence on why individual investors choose to hire financial advisors. They also inform on the optimal design of robo-advisers.

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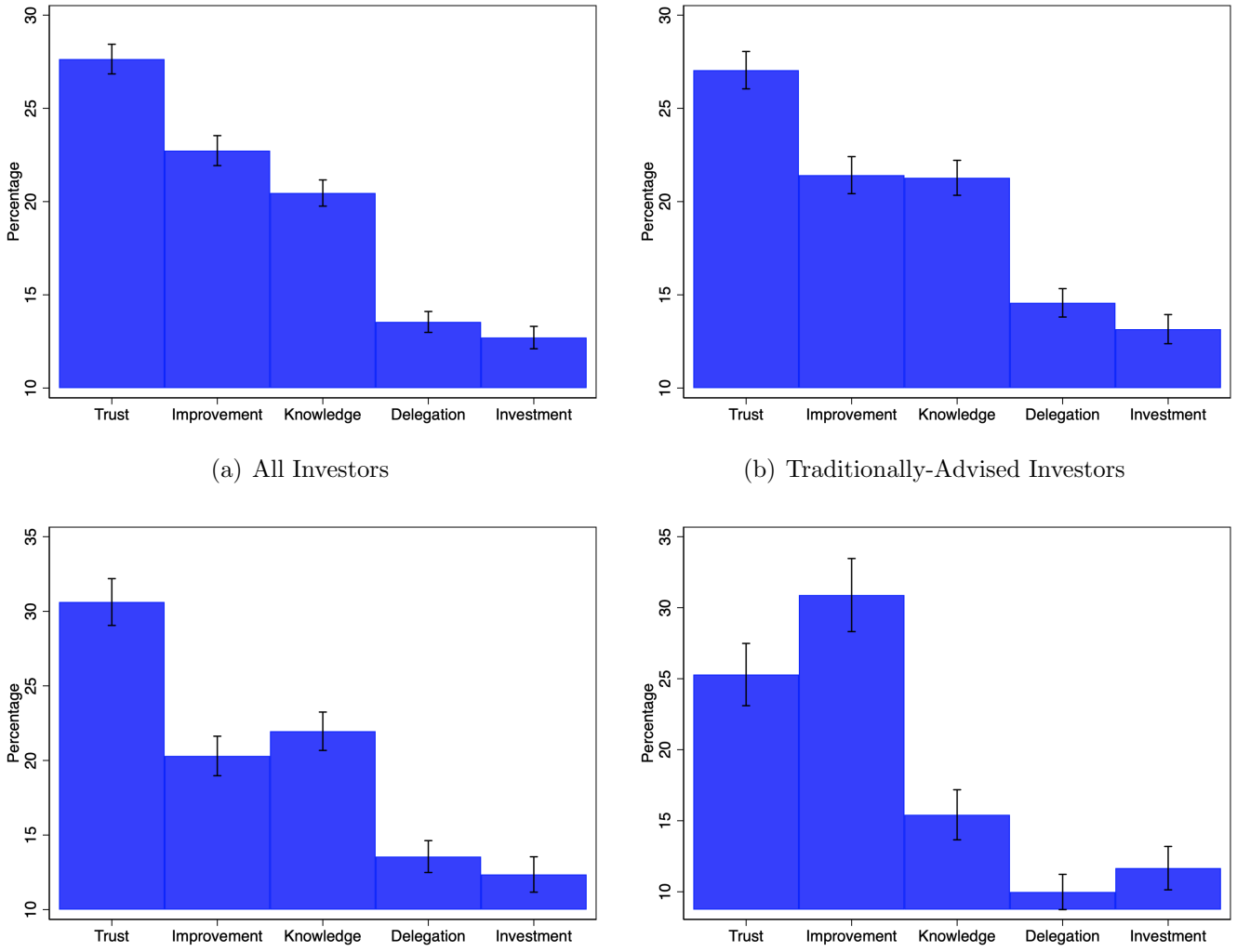


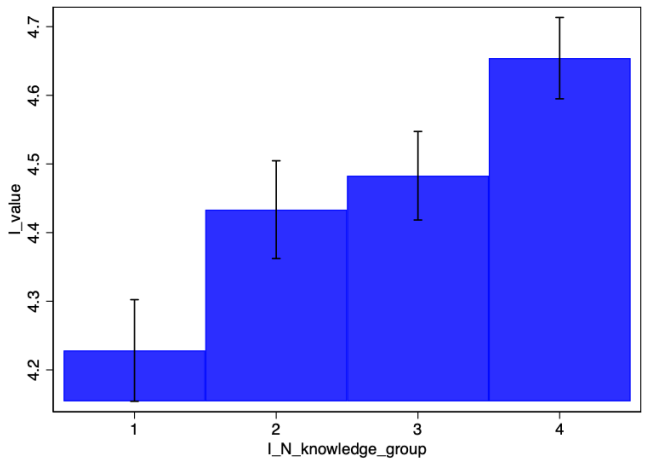
(a) All Investors

(b) Traditionally-Advised Investors

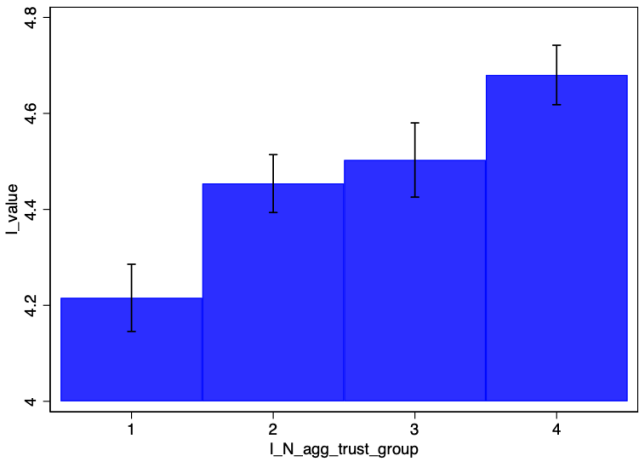
(c) Robo-Advised Investors

(d) Unadvised Investors

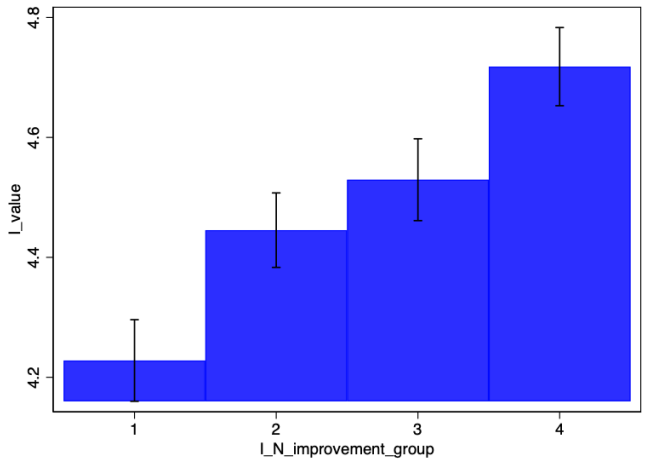
Figure 1. This figure reports bar charts decomposing the importance of five aggregate investor needs: trust, self-improvement, knowledge, delegation, and investment. In each subfigure, we report the average relative importance of each investment need and the corresponding 95% confidence interval. The relative importances sum to 100. Subfigures (a) through (d) report results for all investors, traditionally-advised investors, robo-advised investors, and unadvised individuals.



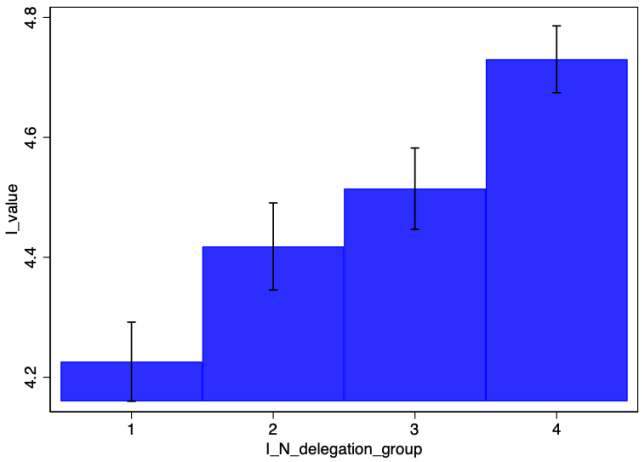
(a) Knowledge



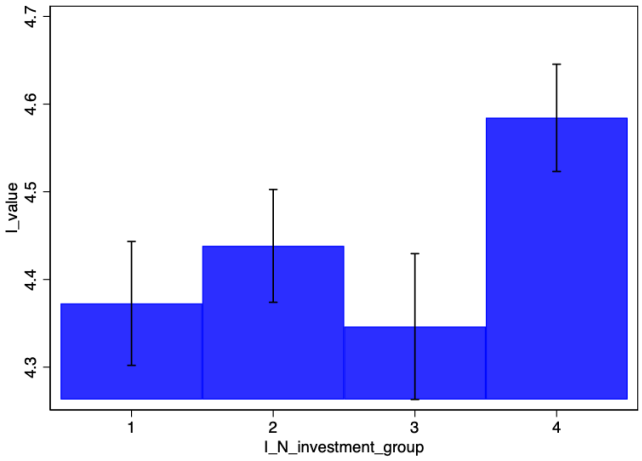
(b) Trust



(c) Self-Improvement

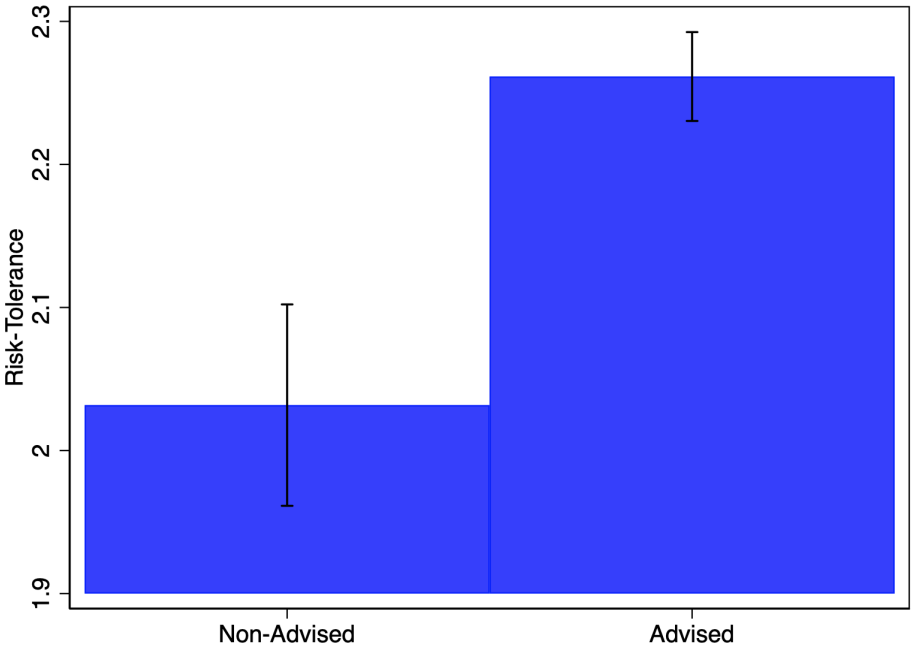


(d) Delegation

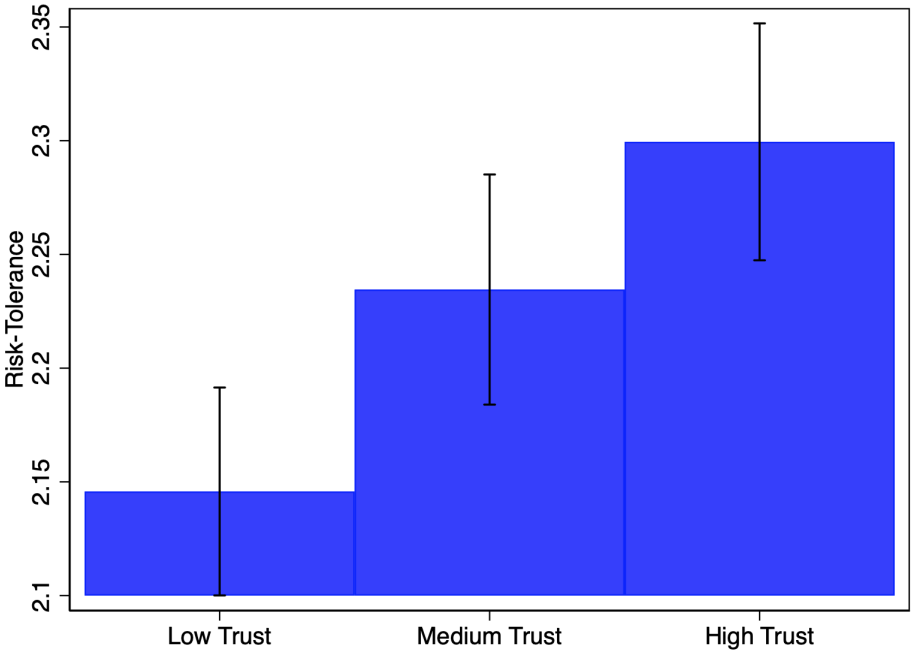


(e) Value

Figure 2. This figure reports bar charts relating value of advice to different investor needs for traditional investors. In each subfigure, investors are sorted into four quartiles on the basis of the perceived importance of each need. Value of advice is measured on a scale from 1 through 5. We then present, for each group, the average value of advice and the corresponding 95% confidence interval. Subfigures (a) through (e) report results for the following aggregate needs: knowledge, trust, self-improvement, delegation, and value.

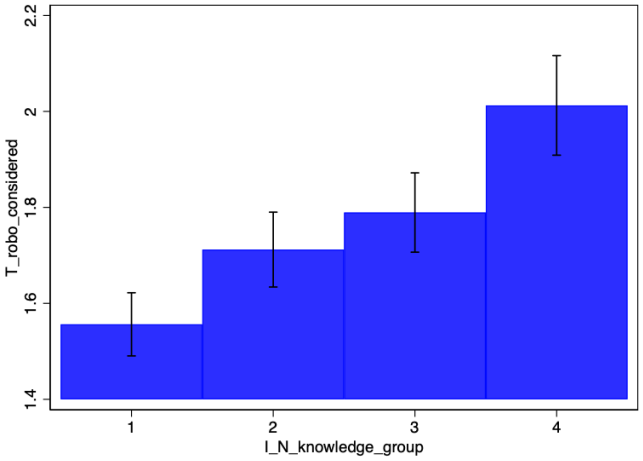


(a) Risk-tolerance of Advised and Non-Advised Investors

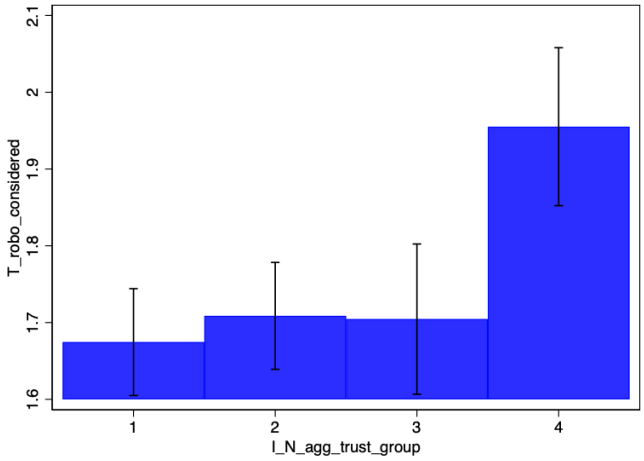


(b) Risk-tolerance by Trust Satisfaction

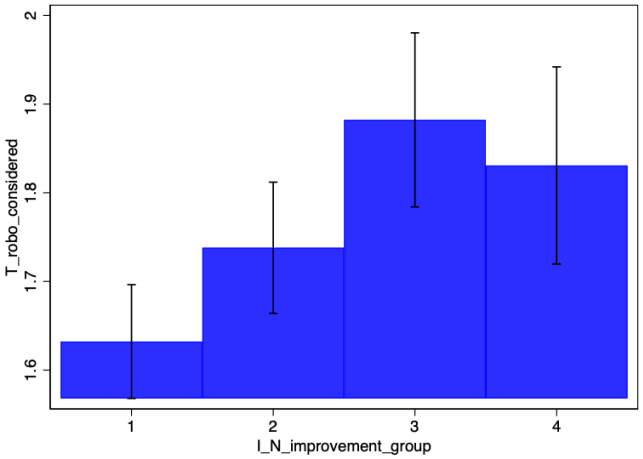
Figure 3. This plots the average risk-tolerance for non-advised and advised investors in Subfigure (a). It reports in Subfigure (b) average risk-tolerance for investors sorted in terciles by the satisfaction of the need for trust. Together with average risk-tolerance values, the plot also reports 95% confidence intervals.



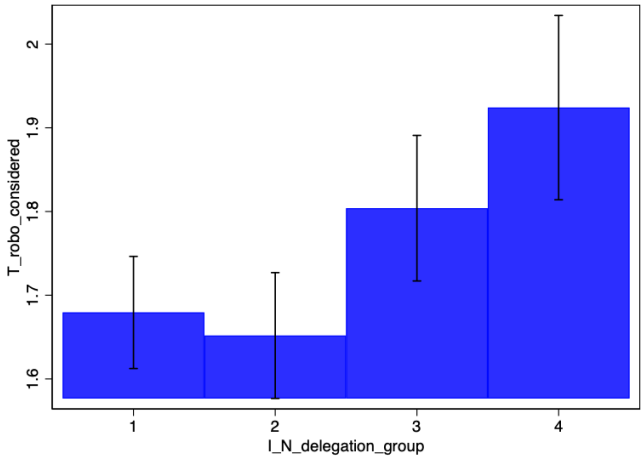
(a) Knowledge



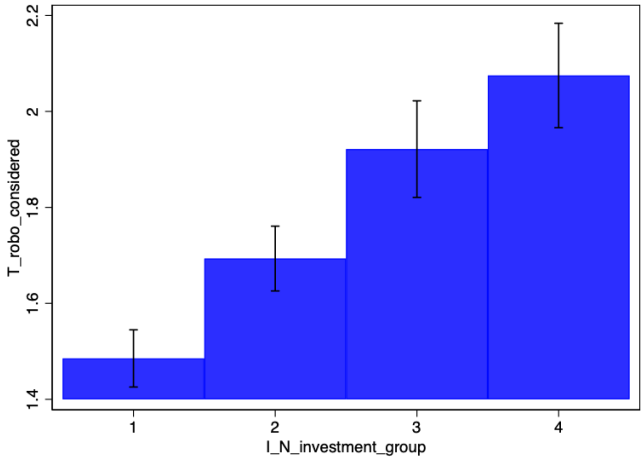
(b) Trust



(c) Self-Improvement

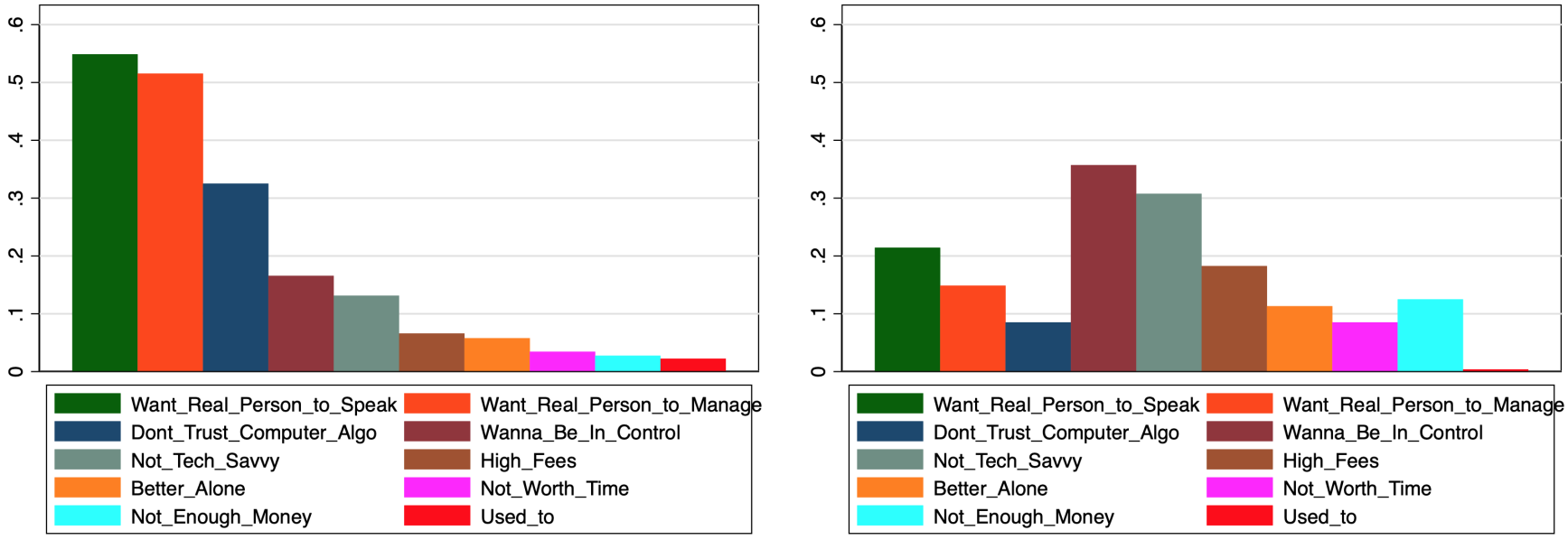


(d) Delegation



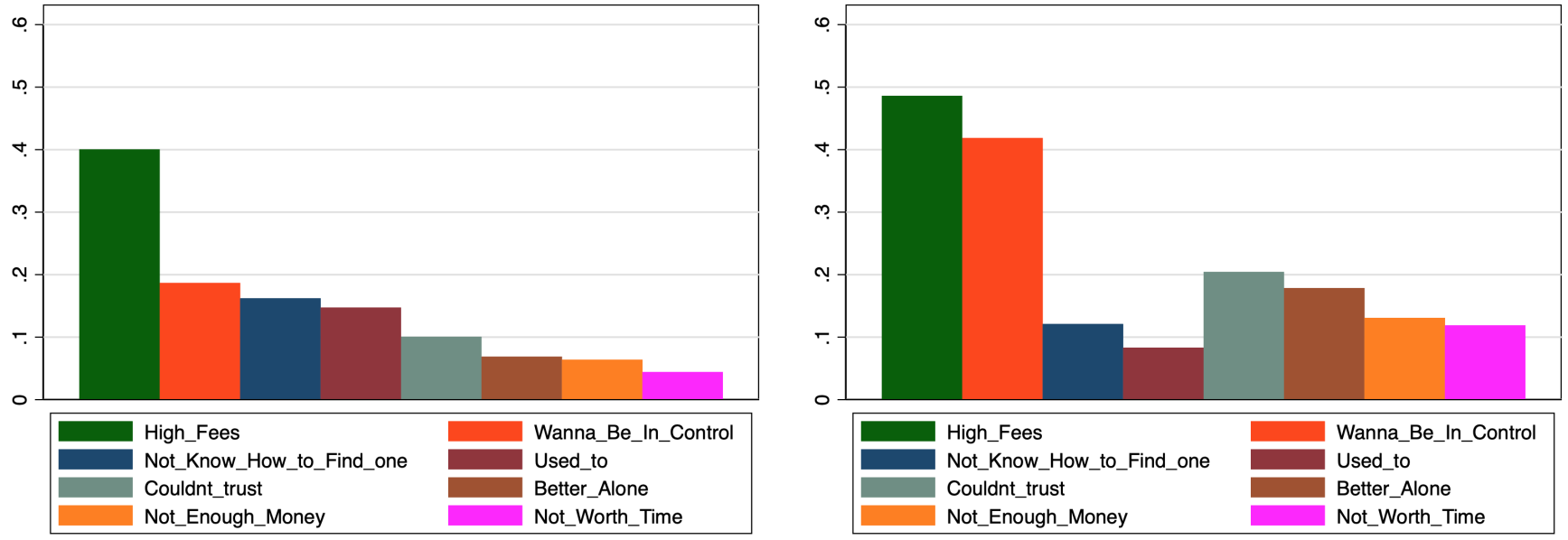
(e) Value

Figure 4. This figure reports bar charts relating the propensity to adopt robo-advising to different investor needs for traditional investors. In each subfigure, investors are sorted into four quartiles on the basis of the perceived importance of each need. Value of advice is measured on a scale from 1 through 5. We then present, for each group, the average value of advice and the corresponding 95% confidence interval. Subfigures (a) through (e) report results the following aggregate needs: knowledge, trust, self-improvement, delegation, and value.



(a) Reasons for No Robo-advising. Traditionally-Advised

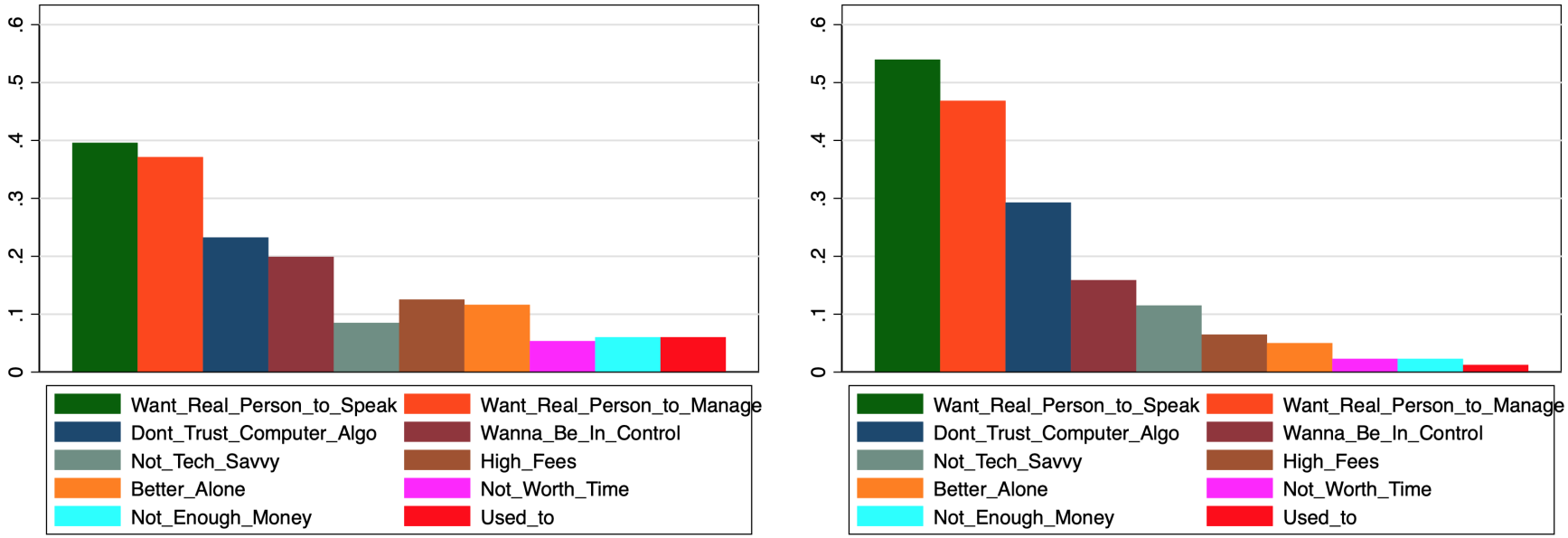
(b) Reasons for No Robo-advising. Unadvised



(c) Reasons for No Human Advisor. Robo-Advised

(d) Reasons for No Human Advisor. Unadvised

Figure 5. This figure reports bar charts with the reasons for not adopting robo-advising and the reasons for not using a human advisor. Subfigures (a) and (b) report the reasons for not adopting robo-advising for traditionally-advised and unadvised investors, respectively. Subfigures (c) and (d) report the reasons for not hiring a human advisor, for robo-advised and unadvised investors, respectively.



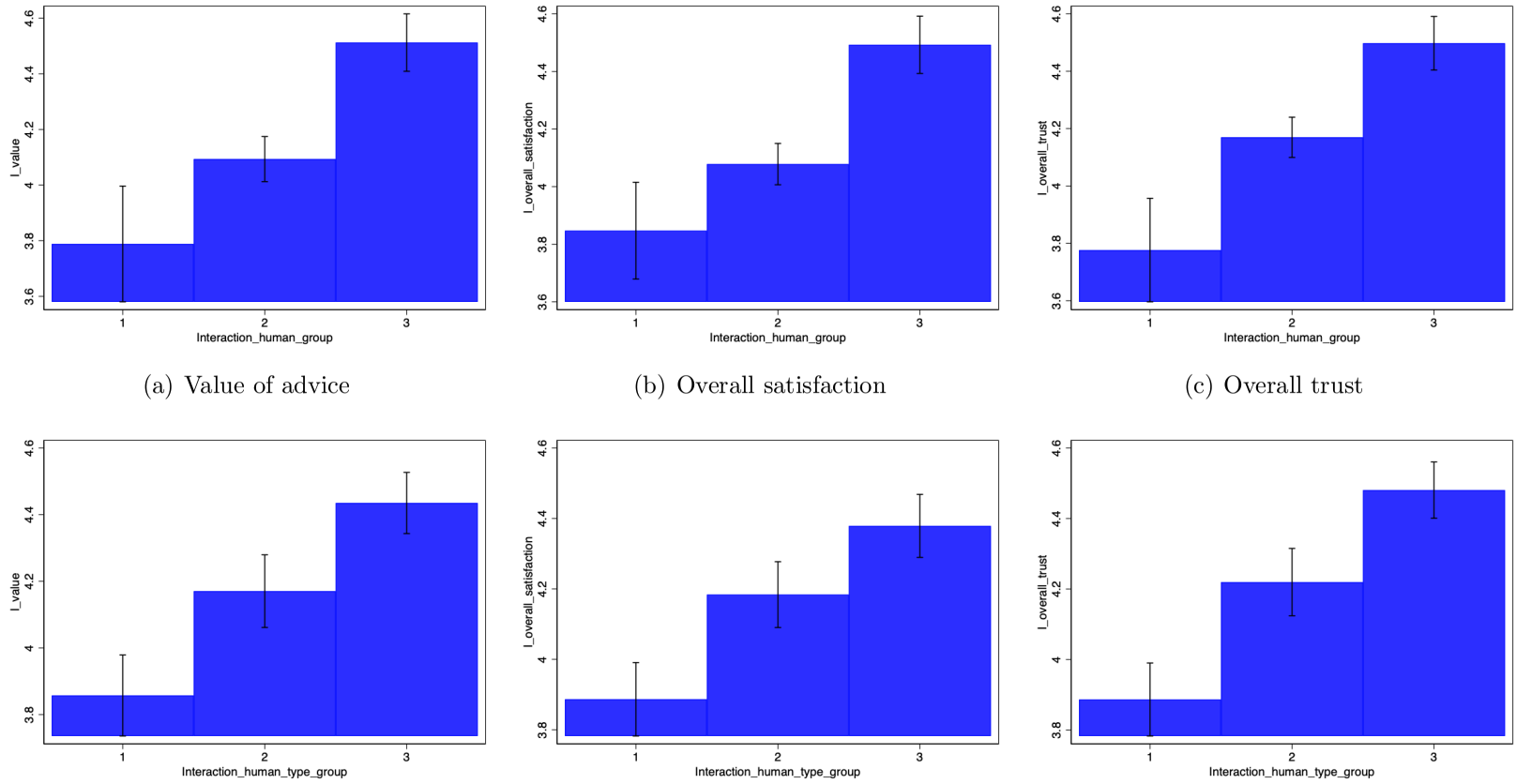
(a) Age Quartile 1

(b) Age Quartile 2

(c) Age Quartile 3

(d) Age Quartile 4

Figure 6. This figure reports bar charts with the reasons for not adopting robo-advising by traditionally-advised investors, conditioning on their age. Subfigures (a) through (d) report the results for age quartiles ranging from 1 through 4, that is, from youngest to oldest.



(a) Value of advice (b) Overall satisfaction (c) Overall trust

(d) Value of advice (e) Overall satisfaction (f) Overall trust

Figure 7. This figure reports bar charts relating value of advice, overall satisfaction, and trust, to the access to humans available to robo-advised investors. In Subfigures (a) through (c), Group_1 does not have access to a human advisor. Group_2 has access to a human advisor, but does not talk to him/her very often. Group_3 frequently talks to advisors. In Subfigures (d) through (f), Group_1 always speaks to a different advisor. Group_2 has access to a rotating advisor among a restricted group of advisors. Group_3 has always access to the same human advisor. We present, for each group, the average value of advice, overall satisfaction, and trust, and the corresponding 95% confidence interval.

Table 1. Financial Advisors Represented by the Survey

Traditionally-Advised			Robo-Advised		
Advisor	Percentage	Rank	Advisor	Percentage	Rank
Fidelity	14.4%	1	Vanguard PAS	65.1%	1
Edward Jones	8.1%	2	Fidelity Go	9.1%	2
Ameriprise	7.9%	3	Acorns	3.5%	3
Merrill Lynch	6.6%	4	Betterment	2.7%	4
Schwab	5.6%	5	E*TRADE	2.4%	5
Morgan Stanley	5.1%	6	TD Ameritrade	1.9%	6
Wells Fargo	4.4%	7	Merrill Lynch	1.3%	7
LPL Financial	3.5%	8	Wells Fargo	1.2%	8
JP Morgan	3.1%	9	Ally Invest	0.9%	9
Vanguard	2.9%	10	Personal Capital	0.8%	10

Table 1. This table reports the most represented financial advisors in the Survey. The results are reported separately for traditionally-advised and robo-advised investors. In each case, we report the company name, the rank, and the percentage of surveyed individuals that are investors of a specific financial advisor. The total number of traditionally-advised investors is 1,744. The total number of robo-advised individuals is 746.

Table 2. Summary Statistics

		Annual Income		
	\$0-\$50K	\$50K-\$100K	\$100K-\$150K	>\$150K
Traditional	15%	40%	27%	18%
Robo	12%	35%	25%	28%
Unadvised	23%	42%	23%	12%
		Retirement Plan Value		
	No Plan	\$0-\$250K	\$250K-\$500K	>\$500K
Traditional	23%	34%	19%	23%
Robo	15%	42%	18%	25%
Unadvised	26%	43%	14%	16%
		Investable Assets		
	\$0-\$250K	\$250K-\$500K	\$500K-\$1M	\$1M-\$5M
Traditional	28%	30%	25%	18%
Robo	32%	19%	25%	24%
Unadvised	55%	22%	13%	10%
		Percentage of Assets with Advisor		
	0-25%	25%-50%	50%-90%	90%-100%
Traditional	10%	16%	47%	28%
Robo	16%	19%	37%	28%
Unadvised	N.A.	N.A.	N.A.	N.A.
		Interaction Frequency with Advisor		
	Weekly	Monthly	Quarterly	Annually
Traditional	3%	24%	51%	22%
Robo	23%	35%	34%	8%
Unadvised	N.A.	N.A.	N.A.	N.A.
		Relationship Length with Advisor (in Years)		
	0-2	3-5	6-15	15-40
Traditional	11%	23%	44%	22%
Robo	59%	32%	9%	0%
Unadvised	N.A.	N.A.	N.A.	N.A.

Table 2. This table reports summary statistics for the main characteristics of the investors surveyed. We report results for: annual income, retirement plan value, investable assets, percentage of assets invested with the advisor, the interaction frequency with the advisor, and the relationship length with the advisor. For each dimension, we report the results separately for traditionally-advised investors, robo-advised investors, and unadvised investors.

Table 3. Facts about Investor Needs

	St. Disagree	Disagree	Neutral	Agree	St. Agree
Need for Knowledge					
Traditional	0%	3%	25%	49%	23%
Robo	0%	2%	18%	51%	28%
Unadvised	2%	19%	33%	34%	13%
Need for Trust					
Traditional	0%	2%	15%	54%	29%
Robo	0%	1%	14%	55%	30%
Unadvised	3%	7%	22%	50%	18%
Need for Self-Improvement					
Traditional	0%	2%	13%	47%	38%
Robo	0%	1%	9%	48%	41%
Unadvised	1%	6%	17%	44%	33%
Need for Delegation					
Traditional	0%	3%	21%	47%	29%
Robo	0%	3%	21%	48%	28%
Unadvised	3%	19%	33%	33%	12%
Need for Investment Performance					
Traditional	0%	10%	39%	36%	15%
Robo	1%	15%	38%	32%	14%
Unadvised	2%	23%	37%	31%	7%

Table 3. This table reports facts about investor needs. We report results for the following aggregate needs: knowledge, trust, self-improvement, delegation, and investment performance. Investors were asked to rate the importance of each need on a scale from 1 to 5: 1) strongly disagree; 2) disagree; 3) neutral; 4) agree; 5) strongly agree. For each aggregate need, we present the proportion of investors that selected each answer. We report the results separately for traditionally-advised investors, robo-advised investors, and unadvised investors.

Table 4. Needs and Value of Advice

	Traditionally-Advised		Robo-advised		Unadvised	
Knowledge	0.067*	0.076**	-0.140*	-0.137*	0.356***	0.264***
	(1.68)	(1.96)	(-1.87)	(-1.79)	(4.16)	(3.20)
Trust	0.125***	0.107**	0.055	0.016	0.159*	0.221***
	(2.88)	(2.55)	(0.68)	(0.20)	(1.91)	(2.79)
Improvement	0.061*	0.033	0.136**	0.153**	-0.234***	-0.194***
	(1.67)	(0.94)	(2.11)	(2.34)	(-3.53)	(-2.99)
Delegation	0.195***	0.167***	0.258***	0.213***	-0.061	-0.037
	(5.27)	(4.69)	(3.92)	(3.19)	(-0.71)	(-0.45)
Investment	-0.146***	-0.083***	0.020	0.091*	0.193***	0.063
	(-5.21)	(-2.88)	(0.43)	(1.73)	(2.68)	(0.88)
Age_Group_2		0.148***		-0.117		-0.160
		(3.15)		(-1.26)		(-1.38)
Age_Group_3		0.276***		0.195*		-0.475***
		(5.49)		(1.82)		(-3.88)
Age_Group_4		0.334***		0.116		-0.721***
		(6.10)		(1.04)		(-5.49)
Female_Dummy		0.174***		0.016		-0.099
		(5.17)		(0.25)		(-1.17)
White_Dummy		0.220***		0.224***		0.038
		(3.76)		(2.72)		(0.29)
Risk_Tolerance_Group_2		0.150***		-0.088		0.034
		(3.23)		(-0.70)		(0.33)
Risk_Tolerance_Group_3		0.149***		-0.257*		0.155
		(2.68)		(-1.92)		(1.15)
Risk_Tolerance_Group_4		0.506***		0.046		0.495**
		(6.24)		(0.27)		(2.46)
Tech_Attitude_Group_2		-0.042		-0.098		0.219**
		(-1.06)		(-1.09)		(2.23)
Tech_Attitude_Group_3		0.010		-0.140		0.506***
		(0.19)		(-1.34)		(4.03)
Tech_Attitude_Group_4		-0.015		-0.056		0.082
		(-0.18)		(-0.39)		(0.38)
Relation_Length_Group_2		0.091		-0.023		
		(1.51)		(-0.32)		
Relation_Length_Group_3		0.194***		0.139		
		(3.53)		(1.19)		
Relation_Length_Group_4		0.330***				
		(5.43)				
Investable_Assets_Group_2		0.022		-0.085		0.056
		(0.50)		(-0.92)		(0.53)
Investable_Assets_Group_3		0.000		-0.070		0.069
		(0.01)		(-0.79)		(0.52)
Investable_Assets_Group_4		0.068		0.052		-0.148
		(1.35)		(0.57)		(-1.00)
Constant	3.251***	2.489***	2.938***	2.933***	1.323***	1.600***
	(31.65)	(18.16)	(14.06)	(11.19)	(6.31)	(5.88)
R-Square	0.095	0.182	0.065	0.121	0.171	0.286
N	1,744	1,744	746	726	504	504

Table 4. This table reports multivariate regression results relating investor value of advice and investor needs. The results are computed for traditionally-advised, robo-advised and unadvised investors. For each investor-category, we run regressions that include only the aggregate needs as well as regressions that include dummies for the following control variables: age, gender, race, risk-tolerance, tech-attitude, and relation-length with the advisor. For each specification, we report coefficients, t-statistics, R-square and number of observations.

Table 5. Needs Satisfaction and Value of Advice

	Traditionally-advised		Robo-advised	
Knowledge	0.122***	0.130***	0.227***	0.195**
	(2.66)	(2.91)	(2.95)	(2.46)
Trust	0.245***	0.221***	0.242***	0.253***
	(5.21)	(4.78)	(3.35)	(3.38)
Improvement	0.032	0.017	0.115*	0.116
	(0.81)	(0.42)	(1.67)	(1.64)
Delegation	0.174***	0.166***	0.142**	0.136*
	(4.03)	(3.94)	(2.09)	(1.96)
Investment	-0.053	-0.043	-0.076	-0.072
	(-1.56)	(-1.28)	(-1.35)	(-1.23)
Positive_Emotions	0.616***	0.576***	0.797***	0.864***
	(9.16)	(8.66)	(6.62)	(6.96)
Negative_Emotions	-1.219***	-1.098***	-1.219***	-1.158***
	(-5.38)	(-4.95)	(-2.89)	(-2.71)
Age_Group_2		0.071*		-0.112
		(1.77)		(-1.49)
Age_Group_3		0.142***		0.015
		(3.30)		(0.18)
Age_Group_4		0.180***		0.006
		(3.89)		(0.07)
Female_Dummy		0.158***		0.147***
		(5.50)		(2.74)
White_Dummy		0.121**		0.128*
		(2.42)		(1.90)
Risk_Tolerance_Group_2		0.081**		-0.046
		(2.04)		(-0.45)
Risk_Tolerance_Group_3		0.101**		-0.123
		(2.15)		(-1.12)
Risk_Tolerance_Group_4		0.420***		0.098
		(6.13)		(0.72)
Tech_Attitude_Group_2		-0.064*		-0.137*
		(-1.89)		(-1.85)
Tech_Attitude_Group_3		-0.004		-0.210**
		(-0.09)		(-2.47)
Tech_Attitude_Group_4		-0.079		-0.223*
		(-1.10)		(-1.89)
Relation_Length_Group_2		0.063		-0.004
		(1.23)		(-0.06)
Relation_Length_Group_3		0.101**		0.124
		(2.13)		(1.29)
Relation_Length_Group_4		0.193***		
		(3.70)		
Investable_Assets_Group_2		-0.012		-0.097
		(-0.33)		(-1.29)
Investable_Assets_Group_3		0.000		-0.126*
		(0.00)		(-1.74)
Investable_Assets_Group_4		0.042		-0.102
		(0.97)		(-1.36)
Constant	2.079***	1.757***	1.349***	1.517***
	(20.52)	(14.22)	(7.39)	(6.62)
R-Square	0.361	0.402	0.383	0.415
N	1,744	1,744	746	726

Table 5. This table reports multivariate regression results relating investor value of advice and the satisfaction of investor needs. The results are computed for traditionally-advised, robo-advised and unadvised investors. For each investor-category, we run regressions that include only the satisfaction of the aggregate needs as well as regressors capturing whether investors experience positive or negative emotions when interacting with their advisor. We also run regressions that include dummies for the following control variables: age, gender, race, risk-tolerance, tech-attitude, and relation-length with the advisor. For each specification, we report coefficients, t-statistics, R-square and number of observations.

Table 6. Needs Satisfaction and Value of Advice—Weighted Results

	Overall Satisfaction		Value of Advice	
Knowledge	0.021***	0.023***	0.005	0.003
	(3.20)	(3.44)	(0.42)	(0.24)
Trust	0.030***	0.025***	0.037***	0.036***
	(4.37)	(3.79)	(3.14)	(2.94)
Improvement	0.002	-0.000	0.014	0.015
	(0.32)	(-0.08)	(1.37)	(1.43)
Delegation	0.027***	0.024***	0.027**	0.022**
	(4.41)	(4.08)	(2.53)	(2.05)
Investment	-0.016***	-0.010**	-0.001	0.005
	(-3.31)	(-1.96)	(-0.14)	(0.54)
Positive_Emotions	0.707***	0.659***	0.994***	1.046***
	(10.24)	(9.68)	(8.11)	(8.25)
Negative_Emotions	-1.795***	-1.611***	-1.919***	-1.807***
	(-7.83)	(-7.19)	(-4.43)	(-4.13)
Age_Group_2		0.094**		-0.096
		(2.28)		(-1.22)
Age_Group_3		0.168***		0.040
		(3.81)		(0.44)
Age_Group_4		0.213***		0.013
		(4.46)		(0.14)
Female_Dummy		0.150***		0.106*
		(5.11)		(1.88)
White_Dummy		0.159***		0.148**
		(3.12)		(2.12)
Risk_Tolerance_Group_2		0.094**		-0.092
		(2.32)		(-0.87)
Risk_Tolerance_Group_3		0.106**		-0.185
		(2.19)		(-1.63)
Risk_Tolerance_Group_4		0.391***		0.035
		(5.50)		(0.25)
Tech_Attitude_Group_2		-0.078**		-0.135*
		(-2.27)		(-1.77)
Tech_Attitude_Group_3		-0.035		-0.243***
		(-0.79)		(-2.74)
Tech_Attitude_Group_4		-0.107		-0.236*
		(-1.46)		(-1.92)
Investable_Assets_Group_2		-0.009		-0.114
		(-0.25)		(-1.47)
Investable_Assets_Group_3		-0.012		-0.135*
		(-0.29)		(-1.79)
Investable_Assets_Group_4		0.029		-0.069
		(0.65)		(-0.89)
Relation_Length_Group_2		0.059		-0.024
		(1.12)		(-0.40)
Relation_Length_Group_3		0.112**		0.095
		(2.33)		(0.96)
Relation_Length_Group_4		0.200***		
		(3.75)		
Constant	3.167***	2.727***	2.618***	2.789***
	(54.11)	(27.75)	(23.11)	(15.60)
R-Square	0.332	0.377	0.336	0.372
N	1744	1744	746	726

Table 6. This table reports multivariate regression results relating investor value of advice and the satisfaction of investor needs, weighted by the importance of each need. The results are computed for traditionally-advised, robo-advised and unadvised investors. For each investor-category, we run regressions that include only the satisfaction of the aggregate needs—weighted by the importance of each need—as well as regressors capturing whether investors experience positive or negative emotions when interacting with their advisor. We also run regressions that include dummies for the following control variables: age, gender, race, risk-tolerance, tech-attitude, and relation-length with the advisor. For each specification, we report coefficients, t-statistics, R-square and number of observations.

Table 7. Financial Needs and Robo-Advising

	Traditionally Advised		Unadvised	
Knowledge	0.201***	0.107***	0.184***	0.133**
	(4.31)	(2.61)	(2.97)	(2.21)
Trust	-0.156***	-0.071	0.063	0.104*
	(-3.08)	(-1.60)	(1.06)	(1.80)
Improvement	0.005	0.047	-0.102**	-0.088*
	(0.11)	(1.29)	(-2.14)	(-1.86)
Delegation	-0.115***	-0.071*	-0.002	0.019
	(-2.71)	(-1.90)	(-0.04)	(0.31)
Investment	0.284***	0.105***	0.102**	0.038
	(8.45)	(3.43)	(1.96)	(0.73)
Age_Group_2		-0.359***		-0.134
		(-6.85)		(-1.58)
Age_Group_3		-0.629***		-0.307***
		(-11.41)		(-3.46)
Age_Group_4		-0.759***		-0.475***
		(-12.80)		(-4.97)
Female_Dummy		-0.152***		-0.194***
		(-4.23)		(-3.15)
White_Dummy		-0.178***		0.084
		(-2.69)		(0.88)
Risk_Tolerance_Group_2		-0.040		0.071
		(-0.83)		(0.96)
Risk_Tolerance_Group_3		0.053		0.071
		(0.90)		(0.72)
Risk_Tolerance_Group_4		0.034		0.034
		(0.34)		(0.23)
Tech_Attitude_Group_2		0.179***		0.201***
		(4.26)		(2.82)
Tech_Attitude_Group_3		0.415***		0.391***
		(7.59)		(4.29)
Tech_Attitude_Group_4		0.648***		0.243
		(6.27)		(1.53)
Investable_Assets_Group_2		0.013		0.064
		(0.28)		(0.83)
Investable_Assets_Group_3		0.062		0.108
		(1.27)		(1.13)
Investable_Assets_Group_4		0.004		0.099
		(0.08)		(0.92)
Relation_Length_Group_2		0.062		
		(0.97)		
Relation_Length_Group_3		-0.068		
		(-1.17)		
Relation_Length_Group_4		-0.221***		
		(-3.46)		
Constant	1.138***	1.958***	1.172***	1.231***
	(9.38)	(13.22)	(7.73)	(6.23)
R-Square	0.086	0.325	0.109	0.225
N	1,573	1,573	504	504

Table 7. This table reports multivariate regression results relating the propensity to adopt robo-advising and investor needs. The results are computed for traditionally-advised and unadvised investors. For each investor-category, we run regressions that include only the aggregate needs as well as regressions that include dummies for the following control variables: age, gender, race, risk-tolerance, tech-attitude, and relation-length with the advisor. For each specification, we report coefficients, t-statistics, R-square and number of observations.

Table 8. Needs Satisfaction in Traditional Advice and Propensity to Adopt Robo-advising

Knowledge	0.074	0.072	-0.020
	(1.13)	(1.09)	(-0.36)
Trust	-0.198***	-0.144**	-0.024
	(-2.96)	(-2.13)	(-0.42)
Improvement	-0.098*	-0.058	0.028
	(-1.71)	(-1.01)	(0.57)
Delegation	-0.097	-0.086	-0.068
	(-1.56)	(-1.38)	(-1.29)
Investment	0.221***	0.203***	0.059
	(4.49)	(4.13)	(1.38)
Positive_Emotions		-0.329***	-0.194**
		(-3.34)	(-2.29)
Negative_Emotions		0.918***	0.450
		(2.70)	(1.55)
Age_Group_2			-0.366***
			(-6.96)
Age_Group_3			-0.636***
			(-11.49)
Age_Group_4			-0.778***
			(-13.11)
Female_Dummy			-0.137***
			(-3.80)
White_Dummy			-0.209***
			(-3.15)
Risk_Tolerance_Group_2			0.003
			(0.06)
Risk_Tolerance_Group_3			0.111*
			(1.90)
Risk_Tolerance_Group_4			0.127
			(1.28)
Tech_Attitude_Group_2			0.196***
			(4.67)
Tech_Attitude_Group_3			0.458***
			(8.37)
Tech_Attitude_Group_4			0.708***
			(6.83)
Investable_Assets_Group_2			0.022
			(0.48)
Investable_Assets_Group_3			0.066
			(1.34)
Investable_Assets_Group_4			0.011
			(0.19)
Relation_Length_Group_2			0.065
			(1.01)
Relation_Length_Group_3			-0.042
			(-0.71)
Relation_Length_Group_4			-0.188***
			(-2.89)
Constant	2.205***	1.978***	2.454***
	(15.42)	(13.15)	(15.29)
R-Square	0.026	0.040	0.318
N	1,573	1,573	1,573

Table 8. This table reports multivariate regression results relating the propensity to adopt robo-advising and the satisfaction of investor needs. The results are computed for traditionally-advised. We run regressions that include only the satisfaction of aggregate needs as well as regressions that include—incrementally—regressors capturing whether investors experience positive or negative emotions when interacting with their advisor and dummies for the following control variables: age, gender, race, risk-tolerance, tech-attitude, and relation-length with the advisor. For each specification, we report coefficients, t-statistics, R-square and number of observations.

Table 9. Human Interaction and Value of Advice for Robo-advised Investors

Human_Interaction_Group_2	0.305***		0.016
	(3.01)		(0.14)
Human_Interaction_Group_3	0.724***		0.330**
	(6.52)		(2.45)
Human_Interaction_Type_Group_2		0.313***	0.230**
		(3.93)	(2.56)
Human_Interaction_Type_Group_3		0.578***	0.507***
		(7.70)	(5.37)
Age_Group_2			-0.182**
			(-2.02)
Age_Group_3			0.073
			(0.70)
Age_Group_4			0.041
			(0.38)
Female_Dummy			0.085
			(1.32)
White_Dummy			0.199**
			(2.46)
Risk_Tolerance_Group_2			-0.004
			(-0.03)
Risk_Tolerance_Group_3			-0.193
			(-1.47)
Risk_Tolerance_Group_4			0.145
			(0.89)
Tech_Attitude_Group_2			-0.085
			(-0.96)
Tech_Attitude_Group_3			-0.056
			(-0.54)
Tech_Attitude_Group_4			0.016
			(0.11)
Investable_Assets_Group_2			-0.088
			(-0.98)
Investable_Assets_Group_3			-0.195**
			(-2.19)
Investable_Assets_Group_4			-0.201**
			(-2.13)
Constant	3.788***	3.857***	3.845***
	(40.69)	(69.62)	(21.00)
R-Square	0.066	0.074	0.145
N	746	746	726

Table 9. This table reports multivariate regression results relating the perceived value of advice for robo-advised investors and the possibility to access human advisors. The results are computed for robo-advised investors only. We run regressions that include dummies for whether robo-advised individuals have access to human advisors, the type of interactions with human advisors as well as regressions that include the following control variables: age, gender, race, risk-tolerance, tech-attitude, and relation-length with the advisor. For each specification, we report coefficients, t-statistics, R-square and number of observations.

Online Appendix: The Needs and Wants in Financial Advice: Human versus Robo-advising

Alberto G. Rossi and Stephen Utkus

Not for Publication

SAMPLE DESCRIPTION

Main Sample: N=3000

- 2000 advised
  - 1750 (maximum quota) traditional advised
    - All must have $100k to <$5M in investable assets
      - Minimum N=120 with $500k to $1M in investable assets
      - Aim to recruit N=120 with $1M to <$5M in investable assets
  - 250 (minimum quota) robo advised
    - All must have $5k to <$5M in investable assets, natural fallout; no more than 75 robo/traditional advised investors
- 500 unadvised
  - All must have $5k to <$5M in investable assets, natural fallout
- 500 Vanguard PAS participants
  - Recruited from a client-provided list

Survey Length: 15 minutes

QUESTIONNAIRE OUTLINE

Screener

S1. Gender
S2. Age
S3. Region
S4. Sensitive Industries
S5. Personal Involvement
S6. Investable Assets
S7. Traditional Classification
S8. Robo Classification
S9. PAS Screener

Financial Context: Traditional Advised

T1. Number of Advisors
T2. Primary and Secondary Advisors
T3. Proportion of Assets Managed
T4. Duration
T5. Contact Frequency and Channel
T6. Holistic Wealth Management
T7. Payment
T8. Portfolio Performance
T9. Previous Advisor
T10. Motivation for Seeking Advice
T11. Robo Usage
T12. Robo Consideration
T13. Robo Barriers

Financial Context: Robo Advised / PAS

R1. Number of Robo Advisors
R2. Primary and Secondary Robo Advisors
R3. Proportion of Assets Managed
R4. Duration
R5. Contact Frequency
R6. Human Access
R7. Payment
R8. Portfolio Performance
R9. Motivation for Seeking Advice
R10. Traditional Advisor Usage
R11. Traditional Advisor Consideration
R12. Traditional Advisor Barriers

Financial Context: Unadvised

U1. Previous Traditional Advisor
U2. Traditional Advisor Consideration
U3. Traditional Advisor Barriers
U4. Previous Robo
U5. Robo Consideration
U6. Robo Barriers

Investor Jobs to be Done

I1. Need Importance
I2. Need Satisfaction
I3. Traditional Satisfaction/Trust/Value
I4. Robo Satisfaction/Trust/Value
I5. Unadvised Satisfaction/Value

Financial Attitudes and Perspective

A1. Investing Duration
A2. Confidence
A3. Knowledge
A4. Risk and Reward
A5. Tech Comfort and Usage
A6. Emotion
A7. Life Events

Demographics

D1. Education
D2. Employment / Retirement
D3. Household Income/Employer-sponsored plans
D4. Financial Obligations
D5. Dependents
D6. Marital Status
D7. Primary Residence
D8. Ethnicity and Family Background

SCREENER

To start, we would like to gather some information to help us better understand who you are.

DO NOT TERMINATE PARTICIPANTS UNTIL END OF SCREENER
ONLY TERMINATE VANGUARD PAS PARTICIPANTS ON QUESTIONS S2 AND S9A/S9B

S1	What is your gender? *Select one.*	
1	❍	Male
2	❍	Female

BALANCED STARTS

S2	In what year were you born?
_	[OPEN NUMERIC, ACCEPT 1917-2017, COMPUTE AGE]

CONTINUE ONLY IF 18+
CAPTURE AGE CATEGORIES: 18-37 = MILLENNIAL, 38 TO 53 = GENX, 54+= BOOMER

S3	Please enter your postal code. [RESPONDENT MUST ENTER VALID POSTAL CODE; IF ENTERED AN INCORRECT POSTAL CODE, PROMPT ONCE TO ENTER CORRECT POSTAL CODE; IF INCORRECT TWICE, TERMINATE]
1	[OPEN NUMERIC]

CAPTURE 4 CENSUS REGIONS

S4A	Which of the following industries have you worked in within the past 5 years? *Please select all that apply.* [RANDOMIZE]	
1	❑	Advertising [TERMINATE]
2	❑	Banking/finance
3	❑	Information technology (IT)
4	❑	Market research [TERMINATE]
5	❑	Consumer packaged goods
6	❑	Manufacturing
99	❍	None of the above [ANCHOR; EXCLUSIVE]

DISPLAY IF "2" SELECTED IN S4A

S4B	You mentioned that you worked in banking/finance within the past 5 years. Which of the following best describes your position? *Please select all that apply.* [RANDOMIZE]	
1	❑	Analyst
2	❑	Financial advisor [TERMINATE]
3	❑	Regional bank teller/employee
4	❑	Management

99	❍	None of the above [ANCHOR; EXCLUSIVE]

S5	How would you describe your personal involvement in your household's **financial and investment decisions?** *Select one.*	
1	❍	I am the primary financial decision maker in my household.
2	❍	I share financial decision-making responsibility equally with someone else in my household.
3	❍	I have some input, but someone else in my household is the primary financial decision maker. [TERMINATE]
4	❍	I have no input in making financial decisions for my household [TERMINATE]

S6	Please tell us the approximate total value of your household's investable assets, **excluding** employer-sponsored retirement plans and the value of your home. By investable assets, we mean any stocks, bonds, mutual funds, ETFs, CDs, or checking/savings accounts belonging to members within your household. Please **do not include** assets that are part of an employer-sponsored retirement plan like a 401(k), 403(b), or pension, and **do not include** any estimated home value(s) in your response**.** *Select one.*	
1	❍	$0 – $4,999 [TERMINATE]
2	❍	$5,000 – $49,999 [IF CLASSIFIED AS TRADITIONAL IN S7, TERMINATE]
3	❍	$50,000 – $99,999 [IF CLASSIFIED AS TRADITIONAL IN S7, TERMINATE]
4	❍	$100,000 – $249,999
5	❍	$250,000 – $499,999
6	❍	$500,000 – $999,999
7	❍	$1,000,000 – $2,499,999
8	❍	$2,500,000 – $5,000,000
9	❍	$5,000,000+
10	❍	I don't know [TERMINATE]

RECRUIT MINIMUM N = 120 TRADITIONAL ADVISED WITH $500,000 - $999,999
AIM TO RECRUIT N = 120 TRADITIONAL ADVISED WITH $1,000,000 - $5,000,000+
NATURAL FALLOUT FOR ROBO ADVISED / UNADVISED PARTICIPANTS

S7	Are you currently working with a **paid professional advisor or online advice service/tool** to manage your finances on an ongoing basis? For example, recommendations for what investment products to buy or sell or how to plan for your financial goals. Note: This excludes financial news publications and forums as well as informal input from friends and family. *Select one.* [RANDOMIZE]	
1	❍	Yes, a dedicated professional advisor or team of professional advisors ONLY [CLASSIFY AS TRADITIONAL ADVISED]
2	❍	Yes, an online advice service/tool ONLY

3	❍	Yes, both a dedicated professional advisor AND an online advice service/tool [CLASSIFY AS TRADITIONAL ADVISED]
4	❍	No, I am not currently working with a paid professional advisor or online advice service/tool [CLASSIFY AS UNADVISED]

DISPLAY IF "2" OR "3" SELECTED IN S7

S8A		You mentioned that you receive help managing your household's finances and/or investments from an **online advice service/tool.** What sort of online advice service/tool(s) do you use? *Select all that apply.* [RANDOMIZE]
1	❑	I log onto a website that provides information about the status of my investment accounts
2	❑	I use an online brokerage that enables me to buy, sell, and/or allocate the investments within my investment portfolio (for example, E*TRADE or Robin Hood).
3	❑	I use an online financial and investment calculator that lets me enter personal details about my finances and then provides me with information I can use to make investment decisions (for example, EZ Financial Calculators).
4	❑	I use an online budget / personal finance tracker (for example, Mint.com).
5	❑	I use an automated investment advice service (robo service) that chooses the right investments for me by using computer algorithms (for example, Betterment or Wealthfront). [IF SELECTED, CLASSIFY AS ROBO ADVISED]
98	❑	Other (please specify) _____ [ANCHOR]
99	❍	None of the above [ANCHOR; EXCLUSIVE]

IF PARTICIPANT QUALIFIES AS BOTH TRADITIONAL AND ROBO, CLASSIFY AS ROBO ADVISED

DISPLAY IF PARTICIPANT QUALIFIES AS BOTH TRADITIONAL (S7) AND ROBO (S8A)

S8B		You mentioned that you have a professional relationship with a financial advisor and that you ***also*** use a robo advice service that chooses the right investments for you through computer algorithms. How much of your investable assets are in each service? *Please select one per row.*
1	❍	A majority of my investable assets are with my **financial advisor** [CLASSIFY AS TRADITIONAL]
2	❍	My investable assets are **split evenly** between the two services [CLASSIFY AS ROBO]
3	❍	A majority of my investable assets are with my **robo advice service** [CLASSIFY AS ROBO]

MONITOR

RECRUIT MAX 1750 TRADITIONAL ADVISED
RECRUIT MIN 250 ROBO ADVISED
RECRUIT MAX 500 UNADVISED
RECRUIT 500 VANGUARD PAS PARTICIPANTS; DO NOT CLASSIFY INTO THE ABOVE 3 GROUPS

DISPLAY FOR VANGUARD PAS PARTICIPANTS

S9A		Are you a current client of Vanguard's Personal Advisor Services? *Select one.*
1	❍	Yes, I am a current client of Personal Advisor Services
2	❍	No, I am not/no longer a client of Personal Advisor Services [TERMINATE]

DISPLAY FOR VANGUARD PAS PARTICIPANTS

S9B	Are you the person in your household who chose to sign up for Vanguard's Personal Advisor Services? *Select one.*	
1	❍	Yes, I am the person who chose to sign up for Personal Advisor Services
2	❍	No, someone else in my household was involved in signing up for Vanguard's Personal Advisor Services. [TERMINATE]

DISPLAY SECTION IF PARTICIPANT QUALIFIES AS TRADITIONAL ADVISED

FINANCIAL CONTEXT: TRADITIONAL ADVISED

In this next section, we'd like to know more about the professional relationship between you and your current financial advisor.

T1	How **many** financial advisors are you currently working with? Please only consider financial advisors that you actually pay. *Select one.*	
1	❍	1
2	❍	2
3	❍	3
4	❍	4 or more

T2A	What [PIPE firm/s] [PIPE is/are] your [PIPE financial advisor/s] currently associated with? *Select up to [PIPE T1 RESPONSE].* [DROP DOWN LIST; ALLOW RESPONDENT TO TYPE IN RESPONSE AND FILTER; LIMIT NUMBER OF RESPONSES BASED ON PARTICIPANTS ANSWER IN T1]	
1	❍	Ameriprise Financial Services, Inc.
2	❍	AXA Advisors, LLC
3	❍	Barclays (Bank)
4	❍	Cetera (IBD)
5	❍	Charles Schwab
6	❍	CitiBank/Citi Private Bank (Bank)
7	❍	Credit Suisse (Bank)
8	❍	Deutsche Bank (Bank)
9	❍	Edward Jones
10	❍	Fidelity
11	❍	Goldman Sachs
12	❍	HSBC (Bank)
13	❍	JP Morgan Chase/Chase Investment Services
14	❍	Lincoln Financial Network
15	❍	LPL Financial
16	❍	Merrill Lynch
17	❍	MetLife Securities
18	❍	MML Investor Services (IBD)
19	❍	Morgan Stanley
20	❍	NY Life Securities
21	❍	Northwestern Mutual Investment Services

22	❍	PNC
23	❍	Raymond James Financial Services
24	❍	RBC Wealth Management (RBD)
25	❍	Robert W Baird (RBD)
26	❍	Stifel Nicholas (RBD)
27	❍	TD Securities (Bank)
28	❍	Transamerica (IBD)
29	❍	UBS
30	❍	Vanguard
31	❍	Wells Fargo Bank/Private Bank
32	❍	Wells Fargo Advisors
98	❍	Other (please specify) _____ [DO NOT INCLUDE IN DROP DOWN LIST]
99	❍	I don't know [DO NOT INCLUDE IN DROP DOWN LIST]

DISPLAY IF 2 OR GREATER SELECTED IN T1

T2B	You mentioned that you work with advisors from the following firms. Which firm is your primary advisor associated with? By primary advisor, we mean the advisor that manages the largest amount of your investable assets. *Select one.*	
1	❍	[PIPE RESPONSES SELECTED IN T2A]
99	❍	I don't know [DO NOT INCLUDE IN DROP DOWN LIST]

For the next series of questions, we'd like you to think about your primary financial advisor from [PIPE T2B RESPONSE].

T3	What proportion of your investable assets is your primary financial advisor managing? *Select one.*	
1	❍	Less than 10% of my household's investable assets
2	❍	10% to 25% of my household's investable assets
3	❍	25 to 50% of my household's investable assets
4	❍	50% to 75% of my household's investable assets
5	❍	75% to 90% of my household's investable assets
6	❍	More than 90% of my household's investable assets
7	❍	100% of my household's investable assets

T4	How long have you been in a professional relationship with your primary financial advisor? *Select one.*	
1	❍	Less than a year
2	❍	1 to 2 years
3	❍	3 to 5 years

4	❍	6 to 10 years
5	❍	11 to 15 years
6	❍	16 to 25 years
7	❍	More than 25 years

T5A	Over the past year, how often did you interact with your primary financial advisor? *Select one.*	
1	❍	Daily
2	❍	Weekly
3	❍	Monthly
4	❍	Quarterly
5	❍	Annually

T5B	When you interact with your primary financial advisor, how do you usually communicate? *Select all that apply.* [RANDOMIZE]	
1	❑	I meet with my financial advisor in person
2	❑	I speak with my financial advisor over the phone
3	❑	I email with my financial advisor
4	❑	I text with my financial advisor
5	❑	I send instant messages online to my financial advisor
98	❑	Other (please specify) _____ [ANCHOR]

BLOCK 1-4 AND 5-11, RANDOMIZE BLOCKS AND ELEMENTS WITHIN BLOCKS. CLASSIFY AS HOLISTIC IF ANY ELEMENT FROM 5-11 IS SELECTED

T6	**Which of the following elements of advice do you receive from your financial advisor**? *Select all that apply.*	
1	❑	Researching and recommending funds for your investment portfolio
2	❑	Managing and changing funds within your investment portfolio when necessary
3	❑	Profiling your attitude towards risk
4	❑	Creating and reviewing a financial plan given my needs and goals
5	❑	Tax planning (recommending the most tax efficient way to invest your wealth, or understanding your needs and recommending a tax expert to help).
6	❑	Insurance planning (ensuring you have the correct amount of disability, life, car, home insurance given your needs).
7	❑	Education planning (helping plan for children's education, student loan consolidation, etc.).
8	❑	Estate planning (helping draft a will, power of attorney, or recommending an attorney to help with these services; gifting strategies).
9	❑	Retirement planning

10	❑	Social Security planning (helping understand and decide when to begin taking Social Security payments).
11	❑	Intergenerational planning (e.g. helping you to plan for providing financial assistance to children or parents)
99	❍	None of the above [ANCHOR; EXCLUSIVE]

T7A		How do you pay for the services you receive from your primary financial advisor? *Select all that apply.*
1	❑	I pay a % of my managed assets
2	❑	I pay a fee per transaction
3	❑	I pay an hourly fee
4	❑	I pay a quarterly/annual fee
5	❑	I pay a one-time upfront planning fee
99	❍	I'm not sure how I pay my financial advisor [ANCHOR; EXCLUSIVE]

DISPLAY IF "1" SELECTED IN T7A

T7B		Could you estimate **the percentage of your managed assets** that you paid to your primary financial advisor in the past year? *Select one.*
1	❍	[OPEN NUMERIC; LIMIT RESPONSES TO PERCENT VALUES]%
99	❍	I don't know how much I pay

T7C		Could you estimate **how much money** you paid to your primary financial advisor over the past year? Please round to the nearest $100 dollars. *Select one.*
1	❍	$[OPEN NUMERIC; LIMIT RESPONSES TO INTERVALS OF $100]
99	❍	I don't know how much I pay

DISPLAY IF "99" IS NOT SELECTED IN T7C

T7D		You estimated that you paid [PIPE T7C NUMERIC RESPONSE] to your primary financial advisor over the past year. How **accurate** do you think your estimate was? *Select one.*
1	❍	Very accurate: I know *exactly* how much I pay
2	❍	
3	❍	Somewhat accurate: I think I have an idea of how much I pay
4	❍	
5	❍	Not at all accurate: I really don't know how much I pay

T8		Overall, how has your portfolio performed since you began working with your primary financial advisor? *Select one.*
1	❍	Way above expectations
2	❍	Above expectations

3	❍	In line with expectations
4	❍	Below expectations
5	❍	Far below expectations

T9A	Have you ever worked with another financial advisor prior to your current primary financial advisor? *Select one.*	
1	❍	Yes
2	❍	No
3	❍	No, I have only had a relationship with my current financial advisor(s)

DISPLAY IF "1" SELECTED IN T9A

T9B	Was it a positive or negative experience? If you have worked with more than one financial advisor prior to your current situation, please think of the most recent prior financial advisor. *Select one.*	
1	❍	It was a positive experience
2	❍	It was a negative experience
3	❍	It was neither a positive nor negative experience

T10	Why did you initially seek out the services of your current primary financial advisor? *Select all that apply.* [RANDOMIZE]	
1	❑	I got married
2	❑	I got divorced
3	❑	My household income significantly increased
4	❑	My household income significantly decreased
5	❑	A death in the family/loss of a loved one
6	❑	I came into a large sum of money/inheritance
7	❑	Serious health/cancer diagnosis
8	❑	I became a parent
9	❑	My child(ren) is/are going to college
10	❑	I bought a home / made a large purchase
11	❑	Retired
98	❑	Other (please specify) _____ [ANCHOR]
99	❍	None of the above [ANCHOR; EXCLUSIVE]

T11	Have you ever used an online robo advice service that chooses investments for you by using computer algorithms (for example, Betterment or Wealthfront)? *Select one.*	
1	❍	I used to use a platform like this, but I don't use it anymore
2	❍	I have never used this type of platform

DISPLAY IF "2" SELECTED IN T11

T12	Have you ever **considered** using an online robo advice service that chooses investments for you? *Select one.*	
1	❍	Yes, I would definitely want to use this type of platform
2	❍	Yes, it is something I'm somewhat interested in
3	❍	No, but I'd be open to changing my mind
4	❍	No, I definitely don't want to use this type of platform

T13	Why don't you currently use an online robo advice service that chooses investments for you? *Select all that apply.* [RANDOMIZE]	
1	❑	The fees are too high
2	❑	I can make more money doing it myself
3	❑	It's not worth the time
4	❑	I don't have enough money to get started
5	❑	I want to make my own investing decisions
6	❑	I used to use this type of platform, but I didn't like the experience
7	❑	I don't trust a computer algorithm to manage my money
8	❑	I'm not comfortable using technology
9	❑	I want a real person to manage my money, not a computer
10	❑	I want to be able speak to a real person abut my finances
98	❑	Other (please specify) _____ [ANCHOR]
99	❍	I don't know [ANCHOR; EXCLUSIVE]

DISPLAY SECTION IF PARTICIPANT QUALIFIES AS ROBO ADVISED OR VANGUARD PAS

FINANCIAL CONTEXT: ROBO ADVISED

In this next section, we'd like to know more about the robo advice service that you use to guide your financial and investment decisions.

R1	How many robo advice services are you currently using? *Select one.*	
1	❍	1
2	❍	2
3	❍	3
4	❍	4 or more

R2A	What robo advice [PIPE service/s] [PIPE is/are] you currently using to guide your financial and investment decisions? *Select up to [PIPE R1 RESPONSE].* [DROP DOWN LIST; ALLOW RESPONDENT TO TYPE IN RESPONSE AND FILTER; LIMIT NUMBER OF RESPONSES BASED ON PARTICIPANTS ANSWER IN R1]	
1	❍	Acorns
2	❍	Ally Invest
3	❍	Aspiration
4	❍	AssetBuilder
5	❍	Betterment
6	❍	Blooom
7	❍	CollegeBacker
8	❍	Covestor Smart Beta Portfolios
9	❍	E*TRADE Adaptive Portfolio
10	❍	EarthFolio
11	❍	Edelman Online
12	❍	Ellevest
13	❍	Fidelity Go [CODE AS HYBRID]
14	❍	Financial Guard
15	❍	Folio Investing
16	❍	FutureAdvisor (BlackRock) [CODE AS HYBRID]
17	❍	GoldBean
18	❍	Grow Invest
19	❍	Hedgeable
20	❍	HedgeCoVest
21	❍	Honest Dollar
22	❍	Huygens Capital

23	❍	Invessence
24	❍	Jemstep by Invesco [CODE AS HYBRID]
25	❍	John Hancock MyPortfolio [CODE AS HYBRID]
26	❍	Kivalia
27	❍	LearnVest
28	❍	Liftoff (Ritholtz)
29	❍	M1 Finance
30	❍	MarketRiders
31	❍	Marstone
32	❍	Merrill Edge Guided Investing [CODE AS HYBRID]
33	❍	Morgan Stanley Access Investing [CODE AS HYBRID]
34	❍	Motif Impact Portfolios
35	❍	Motley Fool Wealth Management
36	❍	NestEgg Wealth (Advisor Engine)
37	❍	NextCapital
38	❍	Personal Capital
39	❍	Physician Capital Partners
40	❍	RBC Investor Gateway
41	❍	Rebalance IRA
42	❍	RobustWealth
43	❍	Schwab Intelligent Advisory [CODE AS HYBRID]
44	❍	Schwab Intelligent Portfolios [CODE AS HYBRID]
45	❍	SigFig Insights
46	❍	Smart401k (Financial Engines)
47	❍	SoFi Wealth Management
48	❍	Stash Invest
49	❍	TD Ameritrade Essential Portfolios [CODE AS HYBRID]
50	❍	TIAA Personal Portfolio [CODE AS HYBRID]
51	❍	True Link Financial
52	❍	Vanguard Personal Advisor Services [CODE AS HYBRID]
53	❍	Wahed Invest
54	❍	WealthFront
55	❍	Wela
56	❍	Wells Fargo Intuitive Investor [CODE AS HYBRID]
57	❍	WiseBanyan

58	❍	WorthFM
98	❍	Other (please specify) _____ [DO NOT INCLUDE IN DROP DOWN LIST]
99	❍	I don't know [DO NOT INCLUDE IN DROP DOWN LIST]

IF HYBRID SELECTED, CODE AS "HYBRID USER"

DISPLAY IF 2 OR GREATER SELECTED IN R1

R2B	You mentioned that you are currently using the following robo advice services to help guide your financial and investment decisions. Which one is your primary robo advice service? By primary robo advice service, we mean the service that manages the largest amount of your investable assets. *Select one.*	
1	❍	[PIPE LIST FROM R2A]
99	❍	I don't know [DO NOT INCLUDE IN DROP DOWN LIST]

For the next series of questions, we'd like you to think about your primary robo advice service, [PIPE R2B RESPONSE; IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"].

R3	What proportion of your investable assets are being managed by your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"]? *Select one.*	
1	❍	Less than 10% of my household's investable assets
2	❍	10% to 25% of my household's investable assets
3	❍	25 to 50% of my household's investable assets
4	❍	50% to 75% of my household's investable assets
5	❍	75% to 90% of my household's investable assets
6	❍	More than 90% of my household's investable assets
7	❍	100% of my household's investable assets

R4	How long have you been using your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"]? *Select one.*	
1	❍	Less than a year
2	❍	1 to 2 years
3	❍	3 to 5 years
4	❍	6 to 10 years
5	❍	More than 10 years

R5	In the past year, how often did you interact with your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"]? By interact we mean log on to your account, access an app to view accounts, speak with a representative, etc.) *Select one.*	
1	❍	Daily

2	❍	Weekly
3	❍	Monthly
4	❍	Quarterly
5	❍	Annually

R6	Does your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"] provide you with access to a person whom you can speak to if you have questions about your account? *Select one.*	
1	❍	Yes, and I regularly talk to a person when I use this service
2	❍	Yes, but I don't talk to a person very often
3	❍	I don't know and I don't feel a need to talk to a person
4	❍	I don't know but I wish I could talk to a person as part of this service
5	❍	No, and I don't need to talk to a person
6	❍	No, but I wish I could talk to a person

DISPLAY IF "1" or "2" SELECTED IN R6

R6A	Which of the following best describes whom you speak with? *Select one.*	
1	❍	I always speak with the same person each time I have a question; I have a dedicated financial advisor or representative
2	❍	I speak with someone on my team of financial advisors or representatives when I have a question
3	❍	I usually speak with someone different when I have a question
98	❍	Other (please specify) _____[ANCHOR; EXCLUSIVE]

R7A	How do you pay for the services you receive from your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"]? *Select all that apply.*	
1	❑	I pay a % of my managed assets
2	❑	I pay a fee per transaction
3	❑	I pay an hourly fee
4	❑	I pay a quarterly/annual fee
5	❑	I pay a one-time upfront planning fee
98	❑	Other (please specify) _____
99	❍	I'm not sure how I pay my robo advice service [ANCHOR; EXCLUSIVE]

DISPLAY IF "1" SELECTED IN R7A

R7B	Could you estimate **the percentage of your managed assets** that you pay to your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"]?	
1	❍	[OPEN NUMERIC; LIMIT RESPONSES TO PERCENT VALUES]%

99	❍	I don't know how much I pay

R7C	Could you estimate **how much money** you paid to your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"] over the past year? *Please round to the nearest $100 dollars.*	
1	❍	$[OPEN NUMERIC; LIMIT RESPONSES TO INTERVALS OF $100]
99	❍	I don't know how much I pay

DISPLAY IF "99" IS NOT SELECTED IN R7C

R7D	You estimated that you paid [PIPE R7C RESPONSE] to your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"] over the past year. How **accurate** do you think your estimate was? *Select one.*	
1	❍	Very accurate: I know *exactly* how much I pay
2	❍	
3	❍	Somewhat accurate: I think I have an idea of how much I pay
4	❍	
5	❍	Not at all accurate: I really don't know how much I pay

R8	Overall, how has your portfolio performed since you started investing with your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"]? *Select one.*	
1	❍	Way above expectations
2	❍	Above expectations
3	❍	In line with expectations
4	❍	Below expectations
5	❍	Far below expectations

R9	Why did you start using a robo advice service? *Select all that apply.* [RANDOMIZE]	
1	❑	I got married
2	❑	I got divorced
3	❑	My household income significantly increased
4	❑	My household income significantly decreased
5	❑	A death in the family/loss of a loved one
6	❑	I came into a large sum of money/inheritance
7	❑	Serious health/cancer diagnosis
8	❑	I became a parent
9	❑	My child(ren) is/are going to college

10	❑	I bought a home / made a large purchase
11	❑	Retired
98	❑	Other (please specify) _____ [ANCHOR]
99	❍	None of the above [ANCHOR; EXCLUSIVE]

DO NOT DISPLAY IF ROBO AND ADVISED

R10	Have you ever had a **professional, paid** relationship with a financial advisor? *Select one.*	
1	❍	I currently have a professional, paid relationship with a financial advisor.
2	❍	I previously had a relationship with a financial advisor whom I'd speak to on ***occasion***, but I don't have one now.
3	❍	I previously had an ***ongoing*** relationship with a paid financial advisor, but I don't have one now.
4	❍	I have never had a relationship with a paid financial advisor

DISPLAY IF 2, 3, OR 4 SELECTED IN R10

R11	Have you **considered** having a relationship with a financial advisor in the future? *Select one.*	
1	❍	Yes, I would definitely want to have a relationship with a financial advisor
2	❍	Yes, it is something I'm somewhat interested in
3	❍	No, but I'd be open to changing my mind
4	❍	No, I definitely don't want a financial advisor

DISPLAY IF 2, 3, OR 4 SELECTED IN R10
DO NOT DISPLAY IF ROBO AND ADVISED

R12	**Why** don't you currently have a relationship with a financial advisor? *Select all that apply.* [RANDOMIZE]	
1	❑	The fees are too high
2	❑	I can make more money doing it myself
3	❑	Not worth the time
4	❑	I don't have enough money to get started
5	❑	I want to make my own investing decisions
6	❑	I used to have a financial advisor, but I didn't like the experience
7	❑	I couldn't trust someone else with my money
8	❑	I'm unsure how to find an advisor/where to begin
98	❑	Other (please specify) _____ [ANCHOR]

DISPLAY SECTION IF PARTICIPANT QUALIFIES AS UNADVISED

FINANCIAL CONTEXT: UNADVISED

In this next section, we'd like to know more about your background as an investor.

U1		Have you ever had a **professional, paid** relationship with a financial advisor? *Select one.*
1	❍	I previously had a relationship with a paid financial advisor whom I'd speak to on ***occasion***, but I don't have one now.
2	❍	I previously had an ***ongoing*** relationship with a financial advisors, but I don't have one now.
3	❍	I have never had a relationship with a paid financial advisor

DISPLAY IF "3" SELECTED IN U1

U2		Have you ever **considered** having a relationship with a financial advisor? *Select one.*
1	❍	Yes, I would definitely want to have a relationship with a financial advisor
2	❍	Yes, it is something I'm considering
3	❍	No, but I'd be open to changing my mind
4	❍	No, I definitely don't want a financial advisor

U3		**Why** don't you currently have a relationship with a financial advisor? *Select all that apply.* [RANDOMIZE]
1	❑	The fees are too high/ it costs too much
2	❑	I can make more money doing it myself
3	❑	Not worth the time
4	❑	I don't have enough money to get started
5	❑	I want to make my own investing decisions
6	❑	I used to have a financial advisor, but I didn't like the experience
7	❑	I couldn't trust someone else with my money
8	❑	I'm unsure how to find an advisor/where to begin
98	❑	Other, please specify) _____ [ANCHOR]

U4		Have you ever used an online robo advice service that chooses the right investments for you by using computer algorithms (for example, Betterment or Wealthfront)? *Select one.*
1	❍	I used to use a platform like this, but I don't use it anymore
2	❍	I have never used this type of platform

U5		Have you ever **considered** using an online robo advice service that chooses the right investments for you? *Select one.*
1	❍	Yes, I would definitely want to use this type of platform
2	❍	Yes, it is something I'm somewhat interested in
3	❍	No, but I'd be open to changing my mind
4	❍	No, I definitely don't want to use this type of platform

U6		**Why** don't you use an online robo advice service that chooses the right investments for you? *Select all that apply.* [RANDOMIZE]
1	❑	The fees are too high/it costs too much
2	❑	I can make more money doing it myself
3	❑	Not worth the time
4	❑	I don't have enough money to get started
5	❑	I want to make my own investing decisions
6	❑	I used to use this type of platform, but I didn't like the experience
7	❑	I am concerned my financial needs are too complicated for an online robo advice service
8	❑	I don't trust a computer algorithm to manage my money
9	❑	I want a real person to manage my money, and not a computer
10	❑	I want to be able to speak to a real person regarding my finances
98	❑	Other (please specify) _____ [ANCHOR]

INVESTOR JOBS TO BE DONE

Next, we'd like to know more about the different needs that you have as an investor.

I1A	When you think about the management of your investments, which of the following needs are important to you? *Select one in each row.* [RANDOMIZE]					
		Disagree	Neutral	Slightly Agree	Agree	Completely Agree
FINANCIAL: BUDGETING						
1	I need help balancing my spending and saving	❍	❍	❍	❍	❍
FINANCIAL: PERFORMANCE						
2	I need to maximize my investment returns, even at the risk of substantial losses in the value of my portfolio	❍	❍	❍	❍	❍
FINANCIAL: RISK MANAGEMENT (INSURANCE)						
3	I need to protect myself against unexpected events that could negatively impact my investments	❍	❍	❍	❍	❍
4	I need the assurance of guaranteed income in retirement and I am willing to exchange a portion of my portfolio in return for it	❍	❍	❍	❍	❍
FINANCIAL: INVESTMENT EXPERTISE						
5	I need an expert perspective to guide all of my investment decisions	❍	❍	❍	❍	❍
FINANCIAL: FINANCIAL PLANNING						
6	I need a customized financial plan that	❍	❍	❍	❍	❍

	covers more than just my investments					
7	I need to know my financial plan is continuously monitored and updated	❍	❍	❍	❍	❍
PRACTICAL: ACCESS						
8	I need round-the-clock online access to my account	❍	❍	❍	❍	❍
9	I need to have access to a financial expert whenever I need it	❍	❍	❍	❍	❍
PRACTICAL: KNOWLEDGE						
10	I need to expand my knowledge of investments and personal finance	❍	❍	❍	❍	❍
PRACTICAL: COMMUNICATION						
11	I need regular proactive outreach to keep me updated about my finances	❍	❍	❍	❍	❍
PRACTICAL: SURVIVOR SUPPORT						
12	I need to know that my survivors will have help navigating financial decisions after I am gone	❍	❍	❍	❍	❍
PRACTICAL: TIME DELEGATION						
13	I need to have professional financial help so I can spend my time on other things that matter to me	❍	❍	❍	❍	❍
PRACTICAL: SPOUSAL MEDIATOR						
14	I need a neutral third party to facilitate financial discussions between me, my spouse/partner, or other family members	❍	❍	❍	❍	❍
PRACTICAL: ELDER PROTECTION						

15	I need to protect my financial well-being in the event I experience diminished decision-making capabilities in my later years	❍	❍	❍	❍	❍
EMOTIONAL: ACCOMPLISHED						
16	I need to feel like I have taken charge of my financial future	❍	❍	❍	❍	❍
EMOTIONAL: EMPOWERED						
17	I need to feel like I have complete control over all of my financial decisions	❍	❍	❍	❍	❍
EMOTIONAL: PREPARED						
18	I need to feel that I am on track to meet my financial goals	❍	❍	❍	❍	❍
EMOTIONAL: COMFORTED						
19	I need to feel completely reassured that things will be okay, including during financial market downturns	❍	❍	❍	❍	❍
EMOTIONAL: CONNECTED						
20	I need to feel a personal connection with my financial advisor	❍	❍	❍	❍	❍
OVERARCHING						
21	I need to completely trust that my financial advisor/robo advice service will put my needs first and foremost	❍	❍	❍	❍	❍
22	I need to know exactly how much money I'm paying my financial advisor/robo advice service	❍	❍	❍	❍	❍
23	I need complete transparency whenever changes	❍	❍	❍	❍	❍

	are made to my portfolio					
24	I need a financial plan that offers me financial freedom	❍	❍	❍	❍	❍

SKIP IF NO I1A RESPONSES SELECTED AS "AGREE" OR "COMPLETELY AGREE"

I1B	Think about the financial needs that are **most important** to you. If you had 100 points to spread across those needs, how would you divide these points? *Please assign up to 100 points across the following needs that you said were important.* [PRESERVE ORDER FROM I1A] Note that you may assign the points in any way that reflects their importance to you; for example:				
	Need A 0% Need B 0% Need C 100% Need D 0% Need E 0%	Need A 3% Need B 51% Need C 24% Need D 5% Need E 17%	Need A 20% Need B 20% Need C 20% Need D 20% Need E 20%	Need A 0% Need B 0% Need C 80% Need D 15% Need E 5%	
1	[DISPLAY I1A RESPONSES SELECTED AS "AGREE" OR "COMPLETELY AGREE"]	[ALLOCATE 100 POINTS TO THE FOLLOWING NEEDS]			

I2A	Think about your relationship with your primary financial advisor, how well does your financial advisor satisfy the following needs? *Select one in each row.* [PRESERVE ORDER FROM I1A]					
		This need is completely unsatisfied by my financial advisor	This need is somewhat unsatisfied by my financial advisor	Neutral	This need is somewhat satisfied by my financial advisor	This need is completely satisfied by my financial advisor
CATEGORY						
1	[USE LIST FROM I1A]	❍	❍	❍	❍	❍

DISPLAY IF PARTICIPANT CLASSIFIES AS ROBO ADVISED OR VANGUARD PAS

I2B	Think about your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"]. How well does this service satisfy the following needs? *Select one in each row.* [PRESERVE ORDER FROM I1A]					
		This need is completely unsatisfied by [PIPE IN R2A RESPONSE OR VPAS]	This need is somewhat unsatisfied by [PIPE IN R2A RESPONSE OR VPAS]	Neutral	This need is somewhat satisfied by [PIPE IN R2A RESPONSE OR VPAS]	This need is completely satisfied by [PIPE IN R2A RESPONSE OR VPAS]

CATEGORY						
1	[USE LIST FROM I1A]	❍	❍	❍	❍	❍

DISPLAY IF PARTICIPANT CLASSIFIES AS UNADVISED

I2C	When you think about your current approach to managing your investments and finances, how well are the following needs being satisfied? *Select one in each row.* [PRESERVE ORDER FROM I1A]					
		This need is completely unsatisfied	This need is somewhat unsatisfied	Neutral	This need is somewhat satisfied	This need is completely satisfied
CATEGORY						
1	[USE LIST FROM I1A]	❍	❍	❍	❍	❍

DISPLAY IF PARTICIPANT CLASSIFIES AS TRADITIONAL ADVISED

I3A	Overall, how **satisfied** are you with the service received from your primary financial advisor? *Select one.*	
1	❍	I am completely satisfied with my service
2	❍	
3	❍	I'm neither satisfied nor dissatisfied with service
4	❍	
5	❍	I am completely dissatisfied with my service

DISPLAY IF PARTICIPANT CLASSIFIES AS TRADITIONAL ADVISED

I3B	Which of the following best describes how much you **trust** your primary financial advisor? *Select one.*	
1	❍	I completely trust my financial advisor
2	❍	
3	❍	I neither trust nor distrust my financial advisor
4	❍	
5	❍	I don't trust my financial advisor at all

DISPLAY IF PARTICIPANT CLASSIFIES AS TRADITIONAL ADVISED

I3C	Overall, how **valuable** is the service you receive from your primary financial advisor? *Select one.*	
1	❍	Very valuable
2	❍	
3	❍	Somewhat valuable
4	❍	
5	❍	Not at all valuable

DISPLAY IF PARTICIPANT CLASSIFIES AS ROBO ADVISED AND VANGUARD PAS

I4A	Overall, how **satisfied** are you with your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"]? *Select one.*	
1	❍	I am completely satisfied with my service
2	❍	
3	❍	I'm neither satisfied nor dissatisfied with service
4	❍	
5	❍	I am completely dissatisfied with my service

DISPLAY IF PARTICIPANT CLASSIFIES AS ROBO ADVISED AND VANGUARD PAS

I4B	Which of the following best describes how much you **trust** your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"]? *Select one.*	
1	❍	I completely trust this service
2	❍	
3	❍	I somewhat trust this service
4	❍	
5	❍	I don't trust this service at all

DISPLAY IF PARTICIPANT CLASSIFIES AS ROBO ADVISED AND VANGUARD PAS

I4C	Overall, how **valuable** is the service you receive from your primary robo advice service [IF VANGUARD PAS PARTICIPANT, AUTOPUNCH "Vanguard Personal Advisor Services"]? *Select one.*	
1	❍	Very valuable
2	❍	
3	❍	Somewhat valuable
4	❍	
5	❍	Not at all valuable

DISPLAY IF PARTICIPANT CLASSIFIES AS UNADVISED

I5A	Overall, how satisfied are you with **managing your own investments?** *Select one.*	
1	❍	I am completely satisfied with how I manage my investments
2	❍	
3	❍	I am neither satisfied nor dissatisfied with how I manage my investments
4	❍	
5	❍	I am completely dissatisfied with how I manage my investments

DISPLAY IF PARTICIPANT CLASSIFIES AS UNADVISED; RANDOMIZE ORDER OF I5B AND I5C

I5B	Overall, how valuable would it be to receive financial advice from a **professional financial advisor?** *Select one.*	
1	❍	Very valuable
2	❍	
3	❍	Somewhat valuable
4	❍	
5	❍	Not at all valuable

DISPLAY IF PARTICIPANT CLASSIFIES AS UNADVISED; RANDOMIZE ORDER OF I5B AND I5C

I5C	Overall, how valuable would it be to receive advice from an **online robo advice service?** *Select one.*	
1	❍	Very valuable
2	❍	
3	❍	Somewhat valuable
4	❍	
5	❍	Not at all valuable

FINANCIAL ATTITUDES AND PERSPECTIVE

In this next section, we'd like to know a little bit more about the kind of investor that you are today.

A1	In total, how long have you been investing your money? *Select one.*	
1	❍	Less than a year
2	❍	1 to 2 years
3	❍	3 to 5 years
4	❍	6 to 10 years
5	❍	11 to 15 years
6	❍	16 to 25 years
7	❍	More than 25 years

A2	How confident are you when it comes to managing investments and understanding financial markets? *Select one.*	
1	❍	I'm extremely confident
2	❍	I'm mostly confident
3	❍	I'm somewhat confident
4	❍	I'm a little confident
5	❍	I'm not at all confident

A3	How knowledgeable are you about managing investments and understanding financial markets? *Select one.*	
1	❍	I know everything there is to know
2	❍	I know a lot
3	❍	I'm somewhat knowledgeable, but I don't know everything
4	❍	I know a little
5	❍	I don't know anything at all, but I'd like to learn more
6	❍	I don't know anything at all and I'm ok with that

A4	Thinking about how you allocate your investable assets, do you lean more towards risk or reward on a scale of 1 to 5? *Select one.*

1	❍	I want to avoid risk at all costs, even if it means my assets won't grow as fast as I would like
2	❍	
3	❍	I try to find an even balance between risk and reward
4	❍	
5	❍	I want to grow my assets as fast as possible, even if it means taking on extra financial risk

A5A	How would you describe your general attitude towards adoption of new technology? *Select one.*	
1	❍	I'm a technology innovator
2	❍	I'm an early adopter of technology
3	❍	I'm a mainstream adopter of technology
4	❍	I'm hesitant to adopt new technology
5	❍	I'm resistant to new technology

A5B	Which of the following services have you used in the past 3 months? *Select all that apply.* [RANDOMIZE]	
1	❑	Online shopping (for example, amazon.com or macys.com)
2	❑	Online banking (for example, logging into your checking and savings accounts online or via an app)
3	❑	Online payment methods (for example, PayPal, Apple Pay, or Zelle)
4	❑	Online travel booking (for example, expedia.com, travelocity.com, hotels.com, Airbnb.com, or vrbo.com)
5	❑	Online car travel/transportation (for example, Uber, Lyfy, or amtrak.com)
6	❑	Online grocery shopping (for example, Instacart, Peapod, or FreshDirect)
99	❍	None of the above [ANCHOR; EXCLUSIVE]

DISPLAY IF TRADITIONAL ADVISED, ROBO ADVISED, OR VANGUARD PAS

A6	Think about interactions you've had with your advisor/robo advice service in the recent past. Which of the following describes how you felt during those interactions? *Select all that apply.* [RANDOMIZE]	
POSITIVE EMOTIONS		
1	❑	Confident
2	❑	Connected
3	❑	Entertained
4	❑	Happy
5	❑	Proud
6	❑	Satisfied
7	❑	Secure
8	❑	Respected
NEGATIVE EMOTIONS		

10	❑	Afraid
11	❑	Angry
12	❑	Anxious
13	❑	Worried
14	❑	Upset
15	❑	Bored
16	❑	Sad
17	❑	Disappointed
99	❍	None of the above [ANCHOR; EXCLUSIVE]

DISPLAY IF "1" SELECTED IN A6A

A7		Which life events, if any, have you experienced in your life within the past year? *Select all that apply.* [RANDOMIZE]
1	❑	I got married
2	❑	I got divorced
3	❑	My household income significantly increased
4	❑	My household income significantly decreased
5	❑	A death in the family/loss of a loved one
6	❑	I came into a large sum of money/inheritance
7	❑	Serious health/cancer diagnosis
8	❑	I became a parent
9	❑	My child(ren) is/are going to college
10	❑	I bought a home / made a large purchase
11	❑	Retired
98	❑	Other (please specify) _____ [ANCHOR]
99	❍	None of the above [ANCHOR; EXCLUSIVE]

DEMOGRAPHICS

Finally, we'd like to ask a few more questions about your background to help us know a little bit more about who you are.

D1	What is the highest level of education that you have completed? *Select one.*	
1	❍	Some high school
2	❍	High school graduate
3	❍	Associate's degree
4	❍	Bachelor's degree
5	❍	Graduate or professional degree

D2A	What is your current employment status? *Select one.*	
1	❍	Employed full-time
2	❍	Employed part-time
3	❍	Self-employed
4	❍	Student
5	❍	Stay-at-home spouse
6	❍	Retired
7	❍	Not currently employed

DISPLAY IF "RETIRED" IS SELECTED IN D2A

D2B	You mentioned you were retired. How long ago did you retire?
_	[OPEN NUMERIC, RANGE 1-99] years

DISPLAY IF "EMPLOYED FULL-TIME," "EMPLOYED PART-TIME," "SELF-EMPLOYED," OR "STUDENT" IS SELECTED IN D2A

D2C	You mentioned you are currently [INSERT D2A RESPONSE]. When do you think you will be retiring? *Select one.*	
1	❍	Less than 5 years from now
3	❍	Within the next 5-10 years

4	❍	Within the next 10-15 years
6	❍	Within the next 15-25 years
7	❍	More than 25 years from now
8	❍	I don't think I will ever retire, even if I **want** to
9	❍	I **don't want** to ever retire

D3A	What was your 2017 household income in US dollars, **before tax?** Please include all incomes in your household. *Select one.*	
1	❍	Less than $30,000
2	❍	$30,000 - $49,999
3	❍	$50,000 - $74,999
4	❍	$75,000 - $99,999
5	❍	$100,000 - $124,999
6	❍	$125,000 - $149,999
7	❍	$150,000 - $199,999
8	❍	$200,000 - $249,999
9	❍	$250,000 – $299,999
10	❍	More than $300,000

D3B	What is your household's primary source of income? *Select one.*	
1	❍	Income from earned wages or salary
2	❍	Capital gains income from stocks, bonds, 401K, etc.
3	❍	Social Security/Pension
4	❍	Rent, royalties, etc.
98	❍	Other (please specify) _____

D3C	Excluding the household investable assets you told us about earlier, please tell us the approximate value of your household's employer-sponsored retirement plans. By employer-sponsored retirement plans, we mean 401(k), 403(b), or pension plans. *Select one.*	
1	❍	$0 – $4,999
2	❍	$5,000 – $49,999
3	❍	$50,000 – $99,999
4	❍	$100,000 – $249,999
5	❍	$250,000 – $499,999
6	❍	$500,000 – $999,999

7	❍	$1,000,000 – $2,499,999
8	❍	$2,500,000 – $5,000,000
9	❍	$5,000,000+
99	❍	I don't know

D4		Do you have any personal financial obligations? *Select all that apply.* [RANDOMIZE]
1	❑	Student loans
2	❑	Mortgage
3	❑	Child support/alimony
4	❑	College/school/daycare payments (for children, family members, etc.)
5	❑	Credit card debt
6	❑	Car payments
98	❑	Other (please specify) _____ [ANCHOR]
99	❍	No, I don't have any financial obligations [ANCHOR; EXLCUSIVE]

D5		Please select the number of dependents living with you in your home. *Select one.*
1	❍	0
2	❍	1
3	❍	2
4	❍	3
5	❍	4 or more

D6		Which of the following best describes your marital status/living situation? *Select one.*
1	❍	Single (never married)
2	❍	Married
3	❍	In a domestic partnership
4	❍	Widowed/divorced/separated

D7		Which of the following best describes your primary residence? *Select one.*
1	❍	I rent my primary residence
2	❍	I pay a mortgage on my primary residence
3	❍	I own my primary residence
4	❍	I live with someone rent-free

D8	Which of the following best describes your ethnicity? *Select all that apply.* [RANDOMIZE]

1	❑	White/Caucasian
2	❑	Black/African American
3	❑	Hispanic/Latino
4	❑	Asian/Pacific Islander
5	❑	Native American
98	❑	Other (please specify) _____ [ANCHOR]
99	❍	I prefer not to answer [ANCHOR; EXCLUSIVE]