WHAT MATTERS TO INDIVIDUAL INVESTORS? EVIDENCE FROM THE HORSE'S MOUTH

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## ABSTRACT

We survey a representative sample of U.S. individuals about how well leading academic theories describe their financial beliefs and decisions. We find substantial support for many factors hypothesized to affect portfolio equity share, particularly background risk, investment horizon, rare disasters, transactional factors, and fixed costs of stock market participation. Individuals tend to believe that past mutual fund performance is a good signal of stock-picking skill, actively managed funds do not suffer from diseconomies of scale, value stocks are safer and do not have higher expected returns, and high-momentum stocks are riskier and do have higher expected returns.

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A data appendix is available at http://www.nber.org/data-appendix/w25019

The finance literature offers no shortage of theories about investor motivations and beliefs, which translate into choices that in aggregate determine asset prices. However, testing these theories with observational data has been difficult. Finding empirical variation in a hypothesized factor that is incontrovertibly uncorrelated with potentially relevant unobserved variables is often impossible. If we instead evaluate models primarily based on their ability to match endogenous moments in the data, we run up against the difficulty that predictions of competing models are often similar or identical (Fama (1970), Cochrane (2017), Kozak, Nagel, and Santosh (2018)).[1]

We take a different approach in this paper: we ask a nationally representative sample of 1,013 U.S. individuals in the RAND American Life Panel (ALP) how well leading academic theories describe the way they decided what fraction of their portfolio to invest in equities, their beliefs about actively managed mutual funds, and their beliefs about the cross-section of individual stock returns. Our questions aim to test key assumptions of leading theories about investor motivations and beliefs more directly than the usual method of trying to infer the validity of these assumptions by examining downstream outcomes. Because we test a wide range of theories on the same sample using the same research design, it is easier to make apples-to-apples comparisons of different theories. High-wealth investors constitute only a small fraction of our sample, so our results are more informative about individual choices and beliefs than asset prices.[2]

We find substantial support for many of the factors that have been hypothesized to affect portfolio equity share. Forty-eight percent of employed respondents say that the amount of time left until their retirement is a very or extremely important factor in determining the current percentage of their investible financial assets held in stocks, and 36% of all respondents say the same about the amount of time left until a significant non-retirement expense. Background risks such as health risk (47% of all respondents), labor income risk (42% of employed respondents), and home value risk (29% of homeowners) are frequently rated as very or extremely important.

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[1] Distinguishing between models that are observationally equivalent in existing data can be important because they may have different welfare or policy implications. For example, knowing that the stock market's expected returns vary because of irrational cashflow forecasts instead of rational time-varying risk aversion would have profound implications.

[2] Bender et al. (2019) administers a survey similar to this paper's on a sample of wealthy individuals.

Many people say that discomfort with the market is a very or extremely important determinant of their equity share, citing lack of trust in market participants (37% of all respondents), lack of knowledge about how to invest (36% of all respondents), and lack of a trustworthy adviser (31% of all respondents). Transactional considerations which have received scant consideration in the academic literature—needing to have enough cash on hand to pay for routine expenses (47% of all respondents) and concern that stocks take too long to convert to cash in an emergency (29% of all respondents)—are salient. Personal experience of living through stock market returns and personal experience investing in the stock market are rated as very or extremely important by 27% and 26% of respondents, respectively. Non-participation in the stock market is frequently driven by the fixed costs of participation (49% of non-participants) and not liking to think about one's finances (37% of non-participants).

Moving to motives coming from representative-agent asset pricing models, we find particularly strong support for rare disaster theories, with 45% of all respondents describing concern about economic disasters as a very or extremely important factor. However, there is also significant evidence for the importance of long-run aggregate consumption growth risk (30%), long-run aggregate consumption growth volatility risk (26%), consumption composition risk (29%), loss aversion (28%), internal habit (27%), and ambiguity/parameter uncertainty (27%). Consumption commitments, which can be a microfoundation for a representative agent who has external habit utility, garner significant support as well (36%). Thirty-five percent of respondents describe the stock market's contemporaneous return covariance with the marginal utility of money—the fundamental consideration in many modern asset pricing and portfolio choice theories—as very or extremely important. Similar numbers describe return covariance with contemporaneous aggregate consumption growth (30%), with contemporaneous aggregate consumption growth volatility shocks (29%), and with their own marginal utility of consumption (29%) as very or extremely important.

Although many factors appear to determine portfolio equity shares, the importance of each factor is not distributed haphazardly within an individual. Among the 34 factors that were rated by every respondent, only six principal components suffice to explain 54% of the variance in whether

they were rated as very or extremely important. These components can be roughly interpreted as corresponding to neoclassical asset pricing factors; return predictability and retirement savings plan defaults; consumption needs, habit, and human capital; discomfort with the market; advice; and personal experience.

Turning to mutual funds, 51% of those who have purchased an actively managed equity mutual fund say that the belief that the active fund would give them a higher average return than a passive fund was very or extremely important in that purchase decision. However, 27% of active fund investors say that a hedging motive—the belief that the active fund would have *lower* unconditional expected returns than the passive fund but higher returns when the economy does poorly—was very or extremely important. The recommendation of an investment adviser was very or extremely important for 48% of active fund investors' decision to buy an active fund. Consistent with Berk and Green (2004), 46% of all respondents agree or strongly agree that a fund having outperformed the market in the past is strong evidence that its manager has good stock-picking skills. But inconsistent with Berk and Green (2004), only 18% agree or strongly agree that funds have a harder time beating the market if they manage more assets.

Finally, collective expectations about the cross-sectional relationship between stock characteristics and expected returns do not always match historical correlations. Twenty-eight percent of respondents expect value stocks to normally have lower expected returns than growth stocks, a proportion not statistically distinguishable from the 25% who believe the reverse. On the other hand, consistent with the historical relationship, more respondents expect high-momentum stocks to normally have higher expected returns than low-momentum stocks (24%) instead of the reverse (14%). Forty-four percent expect value stocks to normally be less risky than growth stocks, while only 14% believe the opposite. Twenty-five percent expect high-momentum stocks to normally be riskier, while 14% expect them to be less risky.

Surveys on beliefs, motivations, and decision-making processes remain uncommon in financial economics research despite the deep and enduring influence of Lintner's (1956) classic survey work on corporate dividend policy and Bewley's (1999) interviews probing the reasons for wage rigidity. Some notable recent exceptions in corporate finance that each seek to test a wide

range of academic theories in an area are Graham and Harvey (2001), Brav et al. (2005), Graham, Harvey, and Rajgopal (2005), Gompers, Kaplan, and Mukharlyamov (2016), and Gompers et al. (2016). Survey studies of investment professionals with a similarly wide theoretical scope include Cheung and Wong (2000), Cheung and Chinn (2001), and Cheung, Chinn, and Marsh (2004). We view our paper as a contribution to household finance in the spirit of these earlier papers.

Survey methodologies of course have weaknesses. Survey respondents might not be highly motivated to give accurate responses, and the meaning of each response category (e.g., "very important") probably differs across respondents. However, to the extent that such measurement error is white noise, the ordinal ranking of importance and agreement ratings will still be informative. More fundamentally, individuals might not know the true motivations for their decisions because they have not introspected seriously enough, their memory has faded, or they were subliminally influenced. A related critique is the argument that respondents may not regard a factor as important but nonetheless invest "as if" it were (Friedman, 1956). Under this view, the fact that an assumption is false is unimportant as long as it generates accurate predictions.

Our survey measures how individuals consciously *perceive* themselves to be making financial decisions. Although individuals may not have full insight into the true reasons behind their decisions, we argue that it is worthwhile to understand these perceptions for at least five reasons. First, an individual's perceptions are unlikely to be entirely unrelated to her true decision-making process. We suspect that even the most ardent acolyte of Friedman does not dismiss conversations with friends and family members as completely uninformative about their thinking and motivations. A model based on assumptions that are closer to the truth may be more likely to successfully predict behavior out of sample; as Bewley (1999, p. 10) notes, "a false or unrealistic set of assumptions might by accident perfectly predict the known phenomena, but prove treacherous when conditions change." Bewley's concern is germane to many finance applications, where theories are often reverse-engineered to fit known phenomena in data and then tested using the same data. Hausman (1992) argues that having no interest in the accuracy of a theory's assumptions is akin to relying entirely on a road test to predict the future driving performance of a used car and disregarding observations of what is under its hood. Harris and Keane (1999) find

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that relative to a model that tries to predict insurance choices using only plan attributes, adding individuals' survey responses about how important these attributes are to them doubles the model's predictive power.

Second, perceptions and beliefs can help us choose between theories that have similar predictions for prices and quantities but very different implications for our understanding of the world. For example, a set of stocks could have lower expected returns either because of over-optimism about their cashflows or because they are hedges against some risk. The hedging story is less plausible if investors report that these stocks have higher expected returns or higher risk.

Third, individuals' perceptions of their decision-making process affect how they will forecast their future actions, which itself is an input into their actions today. Fourth, these perceptions can affect an individual's demand for debiasing mechanisms, information, and advice. Finally, we believe that it is inherently interesting to know what individuals believe about themselves and the reasons for their behavior. Barberis et al. (2015) argue that theory should endeavor to match survey measures of investor beliefs.

The remainder of the paper proceeds as follows. Section I discusses the process of designing our questions and our survey sample. Section II presents our questions and results relating to individuals' equity allocation decisions. Section III presents the same for actively managed equity mutual funds. Section IV discusses our questions and results regarding investors' perceptions of value and momentum stocks. Section V concludes. An online appendix contains the full survey text, and the survey response data are available on the ALP website.

## I. Survey design and sample

Our goal was to test a broad swath of the leading theories on the determinants of portfolio equity share and the reasons individuals invest in actively managed mutual funds, and to get a general sense for how individuals think about the cross-section of stock returns. We designed each question to map as closely as possible to the applicable theory or concept while excluding other theories or concepts and remaining comprehensible to a layperson.

We pilot-tested our survey questions using U.S. respondents recruited on Amazon's Mechanical Turk online labor market platform. To confirm that our respondents understood the questions, we included "I don't understand" as an answer option. We also included a free response question at the end of the equity allocation section that gave respondents an opportunity to write in additional factors that we had not mentioned in the survey. Based on the responses, we revised our questions and added several new ones to the survey. We then ran a second pilot using Mechanical Turk to confirm that these new questions were understood by respondents.

Next, we solicited feedback on the questions from other researchers, particularly those associated with theories we wished to test. After a second round of revisions, we ran a third Mechanical Turk pilot to confirm that the new questions were clear to respondents. For the overwhelming majority of the questions in our final pilot (61 out of 68), fewer than 1% of respondents reported that they did not understand the question. Even the least understood question had a "do not understand" rate of under 3% of respondents.

We conducted our final survey on the RAND American Life Panel (ALP), a sample of U.S. adults. Panelists are paid to answer survey questions. The payment offered is based on the anticipated time it will take to answer the survey, at a rate of $40 per hour and a minimum of $3 per survey. RAND charged us $34,500 to circulate a survey invitation to 2,148 members of the ALP, with a target sample size of about 1,000 survey completions. Because we reached the target number of survey completions sooner than expected, the survey invitation was closed early. Of those invited, 1,255 read our informed consent disclosure and 1,202 gave consent. Out of the 1,202 who consented, 1,080 reported being "the person in your family most knowledgeable about your assets, debts, and retirement planning," which is a screen based on the criterion used to identify the "financial respondent" in the Health and Retirement Study. An additional 27 reported sharing that status equally with a spouse or partner. These 1,080 + 27 = 1,107 were then asked if they would like to answer additional questions in exchange for additional monetary compensation.[3] Of

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[3] When asking the question about financial knowledge, we gave no indication that identifying oneself as a primary financial decision-maker would result in an opportunity to earn more money. Consistent with our finding a high fraction of respondents reporting that they are the person most knowledgeable about their finances, a 2014 *Money*

the 1,098 who opted to do, we drop 46 individuals because they did not answer any of our substantive questions, and an additional 39 because they gave identical responses to all the equity allocation factor questions, leaving 1,013 in our final sample.

The surveys were completed between December 14, 2016 and December 27, 2016. We anticipated that the survey would take approximately 10 minutes to complete, and the median respondent actually took 13 minutes. Table I reports summary statistics of respondent characteristics.[4] Responses are weighted using raked sample weights provided by the ALP to form a nationally representative sample of primary financial decision-makers.[5] All percentages reported hereafter are weighted percentages.

## II. Equity Share of Portfolio

The first section of the survey asks about the factors that determine the fraction of the individual's wealth invested in equities. We begin by asking respondents the value of their investible financial assets[6] and what percentage of these assets is invested in stocks, either directly

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magazine survey that found that among married adults ages 25 or over with household income of at least $50,000, 97% of men and 79% of women say that they are the primary or co-equal decision-maker on investments (http://time.com/money/2800576/love-money-by-the-numbers, accessed March 16, 2017). We have also computed the results separately for unmarried individuals and find that their answers are highly correlated with those of married individuals. For example, the correlation is 0.87 pooling across the fraction reporting that an equity allocation factor is very or extremely important, the fraction reporting that a factor is very or extremely important in the decision to buy an actively managed mutual fund, the fraction reporting that they agree or strongly agree with an empirical claim about actively managed mutual funds, the fraction responding that a stock characteristic is associated with higher risk, and the fraction responding that a stock characteristic is associated with higher expected returns.

[4] The ALP measures income using two questions. In the first question, participants choose among income categories ranging from "Less than $5,000" to "$75,000 or more." The second question, directed only to those who said their income was at least $75,000 in the first question, asks participants to choose among income categories that range from "$75,000 - $99,999" to "$200,000 or more." In our sample, 80 participants said they earned less than $75,000 in the first question but also have a response recorded for the second question. In these cases, we use only the participant's answer to the first income question.

[5] Raking was based on gender, age, race/ethnicity, education, number of household members, and household income. See https://alpdata.rand.org/index.php?page=weights for more details.

[6] We specify that this value should include "bank accounts, brokerage accounts, retirement savings accounts, investment properties, etc., but NOT the value of the home(s) you live in or any private businesses you own."

or through mutual funds. We classify the 41% of respondents who report a zero allocation to equities as non-participants, and the 59% who report a positive allocation as participants.[7]

We then ask participants, "How important are the following factors in determining the percentage of your investable financial assets that is currently invested in stocks?" Non-participants are asked, "How important are the following factors in causing you to not currently own any stocks?" The answer options for each question are "not important at all," "a little important," "moderately important," "very important," and "extremely important."[8]

The factors are presented to all respondents in the same order. For the exposition that follows, we group the factors into six categories: background risks and assets, social and personal factors, expected return beliefs, factors from neoclassical asset pricing models, nonstandard preferences, and miscellaneous factors. When the direction in which a particular factor should push the equity share does not seem self-evident, we ask respondents follow-up questions regarding the directional effect of the factor.

We begin with a high-level summary of the results across all categories, presented in Table II, to see which factors are globally most important. The first column shows the percent of respondents who report that each factor is very or extremely important. The second column shows the percent who report each factor to be moderately, very, or extremely important. The third column shows the mean rating where each possible response is given a numerical value between 1 and 5 (where 5 represents "extremely important"). The fourth column shows the average value of a standardized variable designed to capture whether a respondent indicated that a factor is important relative to the other factors. This variable is constructed by subtracting the mean numerical value of the respondent's ratings from the numerical value of each response and dividing

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[7] This rate of stock market participation is somewhat higher than the 48.8% reported in the 2013 Survey of Consumer Finances (Bricker et al. (2014)). Seven respondents did not answer the equity allocation question. They were asked about the factors determining the "percentage of your financial assets that is currently invested in stocks" and were not asked about any factors that were asked only of either participants or non-participants.

[8] The answer options were presented in ascending order of importance to all respondents. There is some evidence that survey responses are biased towards answer options that appear earlier (e.g., Malhotra (2008)). Such a primacy effect would lead to a systematic underestimate of each factor's importance.

by the standard deviation of that respondent's numerical rating values. A standardized variable may be more comparable across respondents if each individual interprets the rating scale differently. The correlations between the first measure and each of the other three are 0.90 or higher, so we will focus on the percent who report a factor to be very or extremely important.

Table II shows that there is variation in ratings, but no single dominant factor drives equity share decisions. Particularly important drivers specific to stock market non-participation are fixed costs of participation (49% of non-participants say their wealth being too small to invest in stocks is a very or extremely important factor) and not liking to think about one's finances (37% of non-participants). Across both participants and non-participants, investment horizon in the form of years left until retirement (48% of employed respondents), background risk of expenses due to illness/injury (47% of all respondents) and labor income (42% of employed respondents), the need to maintain cash on hand to pay for routine expenses (47% of all respondents), concern about rare economic disasters (45% of all respondents), and lack of trust in market participants (37% of all respondents) are frequently cited as very or extremely important.

At the other end of the spectrum, external habit, stock market returns before the respondent's birth, advice from peers and media, rules of thumb, and a failure to follow through on intentions to invest in stocks are particularly unlikely (16% of respondents or less) to be rated as very or extremely important. We note that consumption commitments, which Chetty and Szeidl (2016) argue are a microfoundation for a representative agent who has external habit utility, garners significant support (36% of all respondents). A large number of other factors are very or extremely important to between 17% and 36% of respondents.

How likely is the observed variance in responses to occur if respondents were choosing randomly? Let $\{p_1, …, p_5\}$ be the empirically observed probabilities of the five response options, pooled across all the factors in Table II. We conduct a Monte Carlo analysis where in each simulation run, each respondent to a question draws a response randomly and independently from a distribution where the probability of each response is represented by $\{p_1, …, p_5\}$. We overwhelmingly reject the null hypothesis of independent and random choice—the actual data's across-factor standard deviation in the fraction responding very or extremely important is 2.5 times

larger than the highest simulated standard deviation in 1,000 runs. As discussed in Section II.H, a principal component analysis on the survey responses reveals a correlation structure among the responses that is economically sensible. We interpret both of these results as evidence that respondents are not simply choosing responses at random, but are answering our questions in thoughtful and meaningful ways.

In the tables that follow, we will report statistics not only for the entire sample, but also separately by stock market participation status, whether investible assets are at least $100,000 (close to the median respondent's assets), and whether the respondent has a bachelor's degree. We create the latter two splits because wealthier investors have a greater impact on prices, so their motives may be of special interest, and more educated individuals may be less subject to behavioral biases, so their motives may provide more guidance for normative models. However, for the sake of brevity, we will mostly not discuss these subsample results.

*A. Background Risks and Assets*

We being by exploring how risks and assets outside the stock market affect allocations to equity. Table III contains the exact text used to describe each factor and the percent of respondents who report that the factor is very or extremely important in determining their current portfolio equity share.

The largest asset most people have is their human capital, which is subject to wage risk and health risk. If these risks are correlated with stock returns, they should affect the willingness to hold stocks (Bodie, Merton, and Samuelson (1992)). Even if the risks are uncorrelated with stock returns, the optimal allocation to stocks could still fall in principle (Pratt and Zeckhauser (1987), Kimball (1993), Gollier and Pratt (1996)). The empirical literature on background labor income risk has generally found negative effects on equity allocations (Guiso, Jappelli, and Terlizzese (1996), Hochguertel (2003), Angerer and Lam (2009), Palia, Qi, and Wu (2014), Schmidt (2016), Fagereng, Guiso, and Pistaferri (2018)), although the magnitude of these estimates is often small, perhaps due to the econometric problems discussed by Fagereng, Guiso, and Pistaferri (2018). Rosen and Wu (2004) also find that households in poor health hold less in risky assets. To capture

portfolio effects of human capital risk, we ask respondents who are currently employed about the importance of unemployment and wage growth risk in their equity allocation decision (labeled in Table III as "labor income risk"). We ask all respondents about the importance of the risk of expenses related to illness or injury to themselves or a family member ("risk of illness/injury").

A person's human capital wealth generally falls with age, as there is less labor income that can be expected in the future. This should affect the allocation of the financial portfolio because the fraction that the financial portfolio comprises of the total wealth portfolio (financial plus human capital wealth) is changing (Bodie, Merton, and Samuelson (1992)). We therefore ask employed respondents about the importance of the number of years remaining until retirement ("years left until retirement"). Because time until retirement can affect portfolio choice even if respondents are failing to consider the human capital portion of their total wealth—for example, due to a belief in time diversification or negative serial correlation of stock returns (Barberis (2000))—we separately ask about the importance of wages remaining to be earned in one's lifetime relative to current financial wealth ("human capital") to isolate the human capital channel. In a model with intermediate-period consumption, Wachter (2002) shows that the time remaining until a significant non-retirement expense can also affect portfolio risk-taking. Therefore, we also ask all respondents, whether employed or not, about the importance of time remaining until a significant non-retirement expense such as a car purchase, down payment on a home, or school tuition ("time until significant non-retirement expense").

Housing represents a large portion of the typical homeowner's wealth, and Flavin and Yamashita (2002), Cocco (2004), and Yao and Zhang (2005) present models where housing affects the demand for stocks. On the one hand, housing price risk crowds out stockholding as a fraction of one's total wealth portfolio. On the other hand, because the house diversifies against stock risk, homeownership can raise stockholding as a fraction of one's *financial* portfolio. We test both these channels, asking homeowners about concern that one's home value might fall ("home value risk") and asking stock market participants about the belief that one can take more risks in one's financial portfolio because one's non-financial assets, such as a home or a small business, will serve as a cushion against financial portfolio losses ("non-financial assets cushion losses in financial assets").

We also ask about the importance of risk in non-financial assets other than the home, such as small businesses ("non-financial risk"). Heaton and Lucas (2000) find that households with high and volatile proprietary business income have lower stockholdings.

The final background risk we investigate is inflation. Although the notion that stocks are a hedge against inflation has intuitive appeal because stocks are claims on real assets, early empirical studies found that stock returns are negatively correlated with inflation (Lintner (1975), Bodie (1976), Nelson (1976), Fama and Schwert (1977), Gultekin (1983)). Later studies have found that a long position in stocks hedges against inflation over longer horizons (e.g., Boudoukh and Richardson (1993), Solnik and Solnik (1997)). We ask stock market participants about the importance of the belief that when their living expenses increase unexpectedly, the stock market will tend to rise ("stocks are an inflation hedge").

We ask one question only of non-participants: whether the amount of money that they have available to invest is an important factor in their decision not to invest in stocks ("wealth too small"). Vissing-Jørgensen (2003) has argued that fixed costs of stock market participation can explain both non-participation and why it declines with wealth. We investigate what specifically comprises these fixed costs in Section II.G.

Table III summarizes the results for these factors. At the high end, 49% of non-participants say that not having enough money available to invest in stocks was very or extremely important in their decision not to invest in stocks. Somewhat surprisingly, 19% of non-participants with at least $100,000 of investible assets also feel this way, although this could be because other factors cause them to perceive the per-dollar benefit of stockholding to be very low, thus requiring large amounts of wealth to make stockholding worthwhile.[9]

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[9] We asked those who cited "wealth too small" as at least a moderately important factor, "What is the least amount of money you would need to have available to make it worthwhile to invest in stocks?" Among those who rated "wealth too small" to be very or extremely important, the median respondent chose the category "$1,000 - $4,999." However, this response is difficult to interpret because 31% of these participants chose a category that is smaller than the category they indicated for the amount of investible wealth they had. One possibility is that some participants interpreted "available" money to mean something other than all their investible assets (for example, money they would not need to have on hand for expenditures like a down payment in the near future).

Among employed respondents, 48% report that the number of years remaining until retirement was very or extremely important in determining their equity share. Barberis (2000) shows that a longer investment horizon can either increase the optimal equity allocation due to mean reversion of returns or decrease it due to greater parameter uncertainty. We therefore asked those who said this factor was at least moderately important a follow-up question about how an increase in their time to retirement would affect their equity allocation over the next year (for participants) or the likelihood of their investing in stocks over the next year (for non-participants). Because we did not want the increase in working life to be associated with a negative wealth shock, the scenario we presented was one where tomorrow, the respondent decided to retire ten years later than previously planned because she enjoyed working so much.

Table IV shows the distribution of responses among those who reported that years until retirement was very or extremely important. Increases in equity share or equity investment likelihood in response to a longer investment horizon are nearly ten times as likely as decreases (39% versus 4%). Surprisingly, 34% of respondents who say that time to retirement is very or extremely important report that an increase in that time would have no effect on their equity allocation (or their likelihood of participating). There are several potential explanations for this result. First, it may be that even though an increase in investment horizon would cause these respondents to *eventually* change their equity share, they would not do so during the one-year time period we asked about. Strong inertia in individuals' portfolio allocations has been extensively documented in other contexts (Samuelson and Zeckhauser (1992), Choi et al. (2002, 2004)). Second, it may be that the optimal policy function with respect to investment horizon is locally flat for the 34%, even though it is not flat globally. Third, even though we intended to measure the partial derivative of equity share with respect to investment horizon, respondents may be reporting the total derivative. Since a lengthening of expected working life could be accompanied by other economic changes, the total derivative may be zero even if the partial derivative is not. Finally, it is possible that some respondents did not understand the question or answered carelessly. Respondents did seem to struggle with the question's scenario—the non-response rate of 14% is unusually high relative to the non-response rates to our other questions (see, for example, Tables

XIII and X), and 9% said that they did not know what effect it would have—perhaps because it was an unfamiliar one that they had not considered before.

Returning to Table III, we find that the human capital fraction of total wealth is somewhat less important than investment horizon, with 36% reporting that the amount of financial wealth they have relative to expected future wages is a very or extremely important factor. Close behind is the number of years until a large *nonretirement* expenditure, which 36% of respondents describe as very or extremely important. Two background risks stand out from among the six we asked about. Forty-seven percent report that the risk of illness or injury is very or extremely important, even though this risk is unlikely to have much perceived or actual correlation with equity returns. Close behind is labor income risk, at 42% of employed respondents. Home value risk is somewhat less salient, but is still very or extremely important to 29% of homeowner respondents. The final three background factors—stocks as an inflation hedge, non-financial assets as a cushion, and non-financial risks—are each described as very or extremely important by 19% to 20% of the relevant respondents.

## B. Social and Personal Factors

We ask our respondents about eleven social and personal factors. Religion has been hypothesized to influence economic risk-taking since at least Weber (1930). A large body of empirical literature has found that Catholics are less risk averse than Protestants (Barsky et al. (1997), Hilary and Hui (2009), Kumar (2009), Kumar, Page, and Spalt (2011), Shu, Sulaeman, and Yeung (2012), Schneider and Spalt (2016, 2017), Benjamin, Choi, and Fisher (2016)). We therefore ask respondents whether their religious beliefs, values, and experiences played an important role in their equity allocation decision ("religion").

Many authors have argued that religion affects trust (e.g., Putnam (1993), Guiso, Sapienza, and Zingales (2003), Benjamin, Choi, and Fisher (2016)), and Guiso, Sapienza, and Zingales (2008) present evidence that lack of trust in other market participants is an important driver of reluctance to invest in stocks. In light of this work, we ask respondents about the importance of the concern that companies, managers, brokers, or other market participants might cheat them out

of their investments ("low trust in market participants"). Closely related is the difficulty of finding a trustworthy investment adviser ("lack of trustworthy adviser"). We additionally ask about the importance of advice specifically from a professional financial adviser the respondent hired ("advice from professional financial adviser"), advice from a friend, family member, or coworker ("advice from friend, family, or coworker"), advice from media sources ("advice from media"), and a general lack of knowledge about how to invest ("lack of knowledge about how to invest").

There is also a literature on the role of personal experience in financial decision making. Malmendier and Nagel (2011) find evidence that households who have lived through high stock market returns invest more in stocks. Vissing-Jørgensen (2003) finds that the idiosyncratic component of an investor's *own* portfolio return positively affects his expectation of future *aggregate* stock market returns. To investigate whether individuals are conscious of these effects, we ask our respondents about the importance of feelings, attitudes, and beliefs about the stock market gotten from living through stock market returns, whether or not they were invested in stocks at the time ("experience of living through returns"), and the importance of feelings, attitudes, and beliefs about the stock market gotten from personal experiences of investing in the stock market ("personal experience investing in stock market").

We ask non-participants about two additional personal factors. First, we ask about the importance of "financial phobia" (Burchell (2003), Shapiro and Burchell (2012)) in causing their non-participation ("don't like to think about my finances"). Second, it is possible that respondents hold no stock not because they do not want to, but because they have not gotten around to participating, perhaps due to time-inconsistent procrastination (Laibson (1997), O'Donoghue and Rabin (1999)). We therefore ask about the importance of having intended to invest in stocks but not having gotten around to it ("intended to invest in stocks but never got around to it").

Table V shows that a general lack of comfort with financial markets is significant driver of investment choices. The most commonly cited factor is low trust in market participants, which is rated very or extremely important by 37% of respondents. Also common are financial phobia (37% of non-participants), a lack of knowledge about how to invest (36%), and lack of a trustworthy adviser (31%). Experience of living though returns, advice from a professional financial adviser,

personal experience investing in the stock market, and religion are all rated as very or extremely important by 26% to 27% of respondents. Relatively few people say that advice from peers or media was very or extremely important (15% and 12%, respectively), and the least important factor was delay despite an intention to invest in stock (3% of non-participants). Despite evidence that individuals' financial choices exhibit considerable inertia (Samuelson and Zeckhauser (1988), Choi et al. (2002, 2004)), people do eventually move away from their status quo to what they perceive to be their optimum (Carroll et al. (2009)), even if it takes them a few years. Therefore, in a sample that includes many middle-aged and older adults, it may not be unexpected that procrastination is a relatively small driver of stock market non-participation.[10]

*C. Expected Return Beliefs*

We ask about the role of four categories of beliefs about expected stock market returns. We begin with the belief that low stock market returns tend to be followed by more low stock market returns ("stock market returns have momentum"). DeBondt (1993), Fisher and Statman (2000), Vissing-Jørgensen (2003), and Greenwood and Shleifer (2014) find robust survey evidence that individuals hold extrapolative beliefs about aggregate stock market returns on average. If individuals understand the logic of hedging and its applicability here, positive return autocorrelation should cause the unconditional willingness to hold equities to decrease, since poor stock returns are associated with worse future investment opportunities. Conversely, we also ask our respondents whether a belief that low stock market returns tend to be followed by high stock market returns played an important role in their portfolio choice ("stock market returns mean-revert"). Mean reversion means that stocks are a hedge, so unconditionally, it should make people more willing to hold stocks (Barberis (2000)).

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[10] To non-participants who rated "intended to invest but never got around to it" as at least moderately important, we asked follow-up questions about which factors were important in causing them to not get around to investing in stocks. Appendix Table AI shows the distribution of answers for those who rated "intended to invest but never got around to it" as very or extremely important. Only 18% said that procrastination for no good reason was very or extremely important. The most salient drivers were having less money available now than when they originally planned on investing in stocks (42%) and discovering that it was costlier to invest in stocks than they expected (37%).

If individuals believe that expected returns are time-varying, then their equity share at a particular moment in time may be affected by their view that expected returns are particularly high or low at that time. We therefore ask respondents whether a belief that the returns they can expect to earn from investing in stocks right now are lower than usual played an important role in their portfolio choice ("expected stock returns lower than usual right now"). We also ask stock market participants only the reverse question about expected returns being higher than usual ("expected stock returns higher than usual right now").

None of these factors are rated by more than 25% of respondents as very or extremely important (Table VI). The most popular—the belief that expected returns are currently lower than usual—is described as very or extremely important by 25% of respondents and 25% of stock market participants. Right behind this is the converse, that expected returns are currently higher than usual, with 24% support among stock market participants. This balance of opinions about the market risk premium may be partially attributable to the fact that the S&P 500 return in 2016, the year of the survey, was 12%, close to its historical arithmetic average. There is also little difference between the fraction who say that positive return autocorrelation is very or extremely important (19%) and those who say that negative return autocorrelation is very or extremely important (17%).

The fact that similar proportions report positive return autocorrelations and negative return autocorrelations to be very or extremely important does not necessarily contradict the fact that stock return expectations are extrapolative on average. Most individuals probably have not learned the implications of return autocorrelations for hedging demand, and to the extent that non-zero return autocorrelations are mentioned in popular financial advice, the emphasis is usually on negative return autocorrelations which cause stocks to be less risky for long-run investors. Individuals may also not realize that their beliefs generally follow an extrapolative pattern, but instead reason that "this time is different" each time they revise their beliefs.

*D. Neoclassical Asset Pricing Factors*

We investigate nine factors that have been hypothesized to affect the equity premium in neoclassical asset pricing models with a representative agent. Because in equilibrium, the

representative agent must be willing to hold the market portfolio, these theories are implicitly theories of portfolio choice.

A foundational feature of standard asset pricing models is that assets that tend to have low payoffs when the marginal utility of money is high are less attractive than assets that tend to have low payoffs when the marginal utility of money is low. The consumption-based capital asset pricing model (CCAPM) (Rubenstein (1976), Breeden and Litzenberger (1978), Lucas (1978), Breeden (1979)), where an asset's return covariance with consumption growth determines its risk premium, is a special case. To investigate whether individuals consciously think in these terms, we ask each respondent to rate the importance of both of these factors ("return covariance with marginal utility of money" and "return covariance with marginal utility of consumption," respectively). We did not want to tell respondents that the stock market's return *actually* covaries positively with, say, consumption growth; we wanted to elicit whether they believed that this is true *and* this had a significant effect on their asset allocation. Therefore, we ask respondents to rate the importance of their "concern" about this covariance. If a given respondent believed that the stated object of concern was not true, then her natural response would be to report that concern about it is not important.

The failure of the CCAPM is well-documented (Mehra and Prescott (1985)), leading to the other models we test in this section. Motivated by the rare disaster model of Rietz (1988) and Barro (2006), we ask our respondents about the importance of a concern that a dollar invested in stocks will lose more money than a dollar deposited in a bank savings account during an economic disaster ("rare disaster risk").[11] Using the cutoff of Barro and Ursúa (2012), we specify that the disaster in question is one where the U.S. economy's annual output drops by more than 10%.

In contrast to concerns about sudden drops in output during disasters, the long-run risk model (Bansal and Yaron (2004)) emphasizes concerns that stock returns tend to be low when bad

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[11] The equity premium literature compares the average stock market return to the average return on a short-term government bond. We ask respondents to compare the stock market's return in a disaster to a bank savings account return because we were concerned that some respondents may not know what a government bond is. Because deposit accounts are insured by the government, they should have similar safety properties in a disaster.

news arrives about the expectation and volatility of consumption growth over the long run. We ask separate questions about the importance of stock return covariance with news about aggregate consumption growth over the next year ("risk of aggregate consumption over next year")—which could be viewed as a nearly contemporaneous covariance—and about the importance of stock return covariance with news about aggregate consumption growth over the five-year period starting one year in the future ("risk of long-run aggregate consumption"). We choose this five-year period because the half-life of expected growth shocks is about 2.25 years in the Bansal, Kiku, and Yaron (2012) calibration.

We ask analogous questions about economic uncertainty—the importance of stock return covariance with news about aggregate consumption uncertainty over the next year ("risk of aggregate consumption volatility over next year") and stock return covariance with news about aggregate consumption uncertainty over the ten-year period starting one year in the future ("risk of long-run aggregate consumption volatility"). The decade-long period reflects the high persistence of volatility in Bansal, Kiku, and Yaron (2012).

Piazzesi, Schneider, and Tuzel (2007) posit that households have nonseparable preferences over housing and a numeraire good, which leads them to fear "composition risk"—changes to the relative share of housing in their consumption basket. In their model, assets that have low numeraire payoffs when housing consumption is low relative to numeraire consumption command a higher risk premium. To capture composition risk, we ask about the importance of a concern that stock returns will tend to be low when consumption from one's physical living situation is dropping more quickly than the rest of one's consumption basket ("consumption composition risk").

Finally, we ask respondents about the role that consumption commitments play in their allocation decision ("consumption commitments"). Chetty and Szeidl (2007) and Chetty, Sándor, and Szeidl (2017) show how components of the consumption bundle that are difficult to adjust in the short run can cause individuals to invest less in risky assets. When a portion of one's consumption bundle cannot be easily adjusted, a negative shock must be accommodated entirely

through adjustment of uncommitted consumption (e.g., food). This raises the local curvature of utility.

We found it difficult to succinctly describe the exact mechanism through which consumption commitments affect portfolio choice in a manner understandable to a non-economist. Therefore, we simply ask whether consumption commitments are an important factor in determining the respondent's equity share without stating the specific concerns consumption commitments generate or the direction in which they would push equity share. We then ask respondents who report that consumption commitments are at least moderately important a follow-up question about whether an increase in consumption commitments as a fraction of their income would increase, decrease, or have no effect on their equity share.

Table VII shows that the rare disaster model has more support among our respondents than any other neoclassical asset pricing factor: 45% of respondents say that concern about a disaster played a very or extremely important role in determining their equity share.[12] The rare disaster model is an attempt to explain the equity premium within the CCAPM framework, but both the marginal utility of cash and marginal utility of consumption factors draw less support (35% and 29%, respectively) than the rare disaster factor. The fact that the majority of respondents do not cite contemporaneous return covariance with marginal utility as very or extremely important is consistent with the fact that much popular, practitioner, and academic discussion of investing focuses on terminal wealth outcomes without reference to intermediate-period consumption. But even an investor focused only on terminal wealth would be concerned about economic disasters before the terminal period if returns are not strongly negatively autocorrelated.

The second most popular factor is consumption commitments, with 36% of respondents describing them as very or extremely important. In the answers to the follow-up question (shown in Table VIII), among those who say that consumption commitments were very or extremely important, over three times as many report that an increase in their consumption commitments as

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[12] Although we have classified rare disasters as a neoclassical factor, beliefs about disaster likelihood and magnitude may not be rational (Goetzmann, Kim, and Shiller, 2016). A similar caveat applies to our other "neoclassical" factors.

a fraction of income would lead them to reduce their equity exposure (or in the case of stock market non-participants, make them less likely to start participating in the stock market) rather than increase it or make them more likely to participate (45% versus 13%), as Chetty and Szeidl (2007) and Chetty, Sándor, and Szeidl (2016) predict.

Like with the follow-up question regarding investment horizon, a surprisingly high number (31%) of respondents who say that consumption commitments are very or extremely important report that an increase in their consumption commitments would have no effect on their equity allocation (or their likelihood of participating), and another 10% say that they don't know what the portfolio effect would be. This may be because the respondent's perceived optimal equity allocation is locally flat with respect to consumption commitments (the question did not specify how large the hypothetical consumption commitment increase was) or the portfolio adjustment would occur outside of the time horizon the respondents assumed the question was asking about (this question did not specify a time horizon). Changes in consumption commitments are likely to be accompanied by other economic events. Some respondents may have given the total derivative with respect to consumption commitments despite our intention to measure the partial derivative. Others may have been able to compute the partial derivative but felt that we were asking for the total derivative, and found themselves unable to integrate across all the different scenarios to provide an unconditional average effect. Finally, some respondents may have misunderstood the question or answered carelessly.

The two questions about stock return covariance with bad news about aggregate consumption growth and volatility over the next year garner 29% to 30% support. Because they describe covariances between returns and news about nearly contemporaneous consumption, these questions can be interpreted as the aggregate consumption analogues of the marginal utility of consumption question, which pertains to contemporaneous covariance with individual-specific marginal utility. The questions testing long-run risk—stock return covariance with news about expected consumption growth and volatility starting one year in the future—attract similar levels of support: 30% and 26%, respectively. Composition risk involving one's physical living situation earns comparable ratings, with 29% of respondents describing it as very or extremely important.

*E. Nonstandard Preferences*

We ask about four types of nonstandard preferences: loss aversion, ambiguity aversion (which we do not separately identify from the effects of parameter uncertainty), internal habit, and external habit.

Typically, when economists have tried to establish how nonstandard preferences affect portfolio choices, they have measured these preferences using an incentivized laboratory task or a hypothetical choice.[13] They then estimate correlations between the measured preference parameters and portfolio choices to establish a causal link. A serious difficulty for this approach is that measured preference parameters are correlated with many other variables that could plausibly have a direct effect on portfolio choices; for example, the strength of loss aversion is negatively correlated with cognitive ability (Benjamin, Brown, and Shapiro (2013)). To address this issue, researchers additionally control for many potentially relevant covariates. But one can never be certain that every important omitted variable has been controlled for, or that the variables that *are* controlled for are entering the regression with the correct functional form. Fundamentally, the identification problem comes from the fact that there is no exogenous manipulation of preferences available for estimating their causal effect.

Our survey differs in that we ask our respondents to perform the casual inference for us. They are able to do this in principle even without exogenous variation in their own preferences because they can observe their internal decision-making process. By analogy, an engineer who has the blueprints for a machine can infer the causal effect of removing a particular gear, even if she never observes the machine's operation both with and without the gear.

Loss aversion is frequently described as disliking losses more than enjoying gains of equal magnitude (Kahneman and Tversky (1979)), but this property is true of risk-averse individuals as

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[13] There is also a sizable literature that tries to directly elicit a preference parameter (e.g., Barsky et al., 1997, Dohmen et al., 2011) where the researchers *assume* that the preference that they are attempting to measure affects portfolio choices. The estimated correlation between the measured preference and portfolio choice is intended to validate this *measure* of the preference (by showing a non-zero correlation in the expected direction) rather than to test whether the preference *itself* affects portfolio choice.

well. Therefore, we focus on an implication of loss aversion that is not shared with classical risk aversion: aversion to small gambles (Segal and Spivak (1990), Rabin (2000)). We ask respondents if worry about the possibility of even small losses on their stock investments was an important factor in their equity allocation decision ("loss aversion"). Barberis, Huang, and Santos (2001), Barberis and Huang (2001), and Barberis, Huang, and Thaler (2006) present models where loss aversion reduces the demand for stocks. Dimmock and Kouwenberg (2010) estimate survey respondents' loss aversion parameters from their hypothetical intertemporal choices, and find that stronger loss aversion is associated with a lower probability of stock market participation.

Second, we ask about the role of ambiguity or parameter uncertainty, in the form of not having a good sense of the average returns and risks of stocks, in their investment decisions ("ambiguity/parameter uncertainty"). Bayesian investors will reduce their allocation to the risky asset in the face of parameter uncertainty, and investors who are ambiguity averse in the sense of Ellsberg (1961) will reduce their risky allocation even further (Barberis (2000), Garlappi, Uppal, and Wang (2007), Kan and Zhou (2007)). Dow and Werlang (1992) were the first to show theoretically that ambiguity aversion can generate stock market non-participation. Dimmock et al. (2016) find that those who exhibit ambiguity aversion in a laboratory experiment are less likely to hold stocks, and conditional on holding stocks, allocate less to them.

Third and fourth, we ask respondents questions about the role of internal habit and external habit. In the Constantinides (1990) internal habit model, individuals derive utility from consumption today relative to their own past consumption, whereas in the Campbell and Cochrane (1999) external habit model, individuals derive utility from their own consumption today relative to past aggregate consumption. In either case, the result is to increase an individual's risk aversion and hence decrease her willingness to hold stocks. To investigate whether investors are consciously considering these factors, we ask respondents about the importance of the difference between their current material standard of living and the level they are used to ("internal habit") and the importance of the difference between their current material standard of living and the level everybody else around them has experienced recently ("external habit").

Table IX shows that loss aversion is described as very or extremely important by 28% of respondents, internal habit by 27% of respondents, and ambiguity/parameter uncertainty by 27% of respondents. There is relatively little support for external habit, which is deemed very or extremely important by only 16% of respondents. This suggests that, to the extent that external habit-like preferences are important, their microfoundation may be consumption commitments (Chetty and Szeidl (2016)) rather than a psychological desire to keep up with the Joneses.

The internal habit, external habit, and ambiguity/parameter uncertainty factor question wordings do not imply any directionality of the factors' effects. In addition, Dimmock et al. (2016) find that although 52% of American adults are ambiguity averse, 38% are ambiguity *seeking*. Therefore, we ask follow-up questions regarding directionality to anybody who rated one of these factors as at least moderately important. Table X shows the distribution of responses to these follow-up questions among those who rated a factor very or extremely important. We find that consistent with theory, people are much more likely to report decreasing their equity allocation or becoming less likely to invest in equities rather than increasing their equity allocation or becoming more likely to invest in equities in response to a fall in their material standard of living compared to what they are used to (42% versus 8%), or a fall in their material standard of living compared to what everyone around them has experienced recently (47% versus 12%). Similarly, having a better sense of the average returns and risks of investing in stocks is much more likely to result in increasing, rather than decreasing, equity allocations or the probability of investing in equities (58% versus 8%). As with previous follow-up questions, a sizable fraction responded that they would not change their equity allocation or likelihood of investing in equities or that they did not know how they would change these (48% for internal habit, 38% for external habit, and 32% for ambiguity/parameter uncertainty).[14]

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[14] For the ambiguity/parameter uncertainty follow-up question, answering that one did not know which way one would react to having more precise information might be the response we should expect, since the reaction should depend on what the additional information is.

*F. Miscellaneous Factors*

Finally, we ask respondents about the role of five other factors. The first is a rule of thumb such as investing 100 minus age percent of assets in stocks, or investing one-third of one's wealth in each of stocks, bonds, and real estate ("rule of thumb"). The second is the default investment allocation in their work-based retirement savings plan ("default allocation in retirement savings plan"). Madrian and Shea (2001) and Choi et al. (2004) document that a sizeable fraction of investors remain at the default asset allocation in their 401(k) plan if they are automatically enrolled. Third and fourth, we ask about two transactional factors which were motivated by answers to the free-response question in our initial pilot survey about important factors affecting respondents' equity choices that we had not asked about: the concern that stock investments will take too long to convert into spendable cash in an emergency ("stocks take too long to convert to cash in emergency"), and the amount of cash the respondent needs to have on hand to pay routine expenses ("need cash on hand for routine expenses"). These concerns are related to those in the model of Lagos (2010), where equities command a high expected return because they are less useful for facilitating exchange. Finally, we ask respondents about the importance of what they know about the stock market's returns during the decades before they were born ("stock market returns before I was born").

Table XI reports that a large fraction of respondents (47%) say that needing to have cash on hand to pay routine expenses was a very or extremely important factor. The need for emergency liquidity also has substantial support, at 29% of respondents. Even among high-wealth and high-education respondents, the absolute levels of importance are quite high—for example, 40% for needing cash on hand and 23% for stocks taking too long to convert to cash among high-wealth respondents.

Only 26% of respondents identify the default investment allocation in a work-based retirement savings plan as very or extremely important. Although this might seem low in light of the evidence on how sticky defaults are, one must keep in mind that only about half of American workers have access to a work-based "salary reduction plan" (predominantly 401(k) and 403(b)

plans), and only about half of 401(k)/403(b) plans automatically enroll their employees and hence have an asset allocation default (Copeland (2013), Vanguard (2014)).[15]

In accordance with the findings of Malmendier and Nagel (2011) that personally experienced returns have a greater impact than returns one can only read about, only 16% of respondents say that stock returns before their birth played a very or extremely important role in their equity allocation decision, which is significantly lower than the 27% of respondents in Table V who said that stock market returns they had lived through were very or extremely important. Results (not shown in tables) suggest that those younger than 40 are more likely to rate these pre-birth returns as very or extremely important (20.3%, standard error = 5.3%) than those who are at least 60 (12.0%, standard error = 2.3%), although this difference is not statistically significant. Rules of thumb receive relatively little support, with only 13% of respondents regarding them as very or extremely important.

*G. Fixed Costs of Stock Market Participation*

Among stock market non-participants, 49% said that not having enough money to invest in stocks was a very or extremely important factor in their decision not to participate, suggesting that there are fixed participation costs. In this section, we explore what these fixed costs are. We asked non-participants who rated "wealth too small" as at least a moderately important factor a series of follow-up questions about how important various factors were in causing the amount of money they have to be too small. We analyze the responses of those who rated "wealth too small" as very or extremely important.

Vissing-Jørgensen (2003) suggests that fixed costs of stock market participation include the entry costs of acquiring information about investing and setting up accounts, and the ongoing costs of keeping abreast of the market, transacting, and preparing tax returns that are made more

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[15] Table 2 reports that 54% of respondents say that a work-based retirement savings plan default asset allocation was at least moderately important. It is unlikely that 54% of American workers are subject to automatic 401(k) enrollment at their current employer. However, this 54% figure may not be implausible given that the question also asks about one's spouse/partner's workplace retirement savings plan default, and both the respondent and spouse/partner may be influenced by asset allocation defaults at past employers.

complicated by stockholding. We therefore ask non-participants about the importance of the amount of time, money, and/or effort it would take to learn about stocks ("costs of learning about stocks"), hire an investment adviser ("costs of hiring an adviser"), set up an investment account ("costs of setting up an account"), stay up-to-date on the stock market ("costs of staying up-to-date"), maintain a relationship with an investment adviser after hiring him or her ("costs of maintaining an adviser"), maintain an investment account after setting it up ("costs of maintaining an account"), and deal with a tax return that is harder to prepare ("tax complexity").

We ask one question to homeowners about whether owning a home is important in causing them to not have enough money to make it worthwhile to invest in stocks ("home crowd-out"). This question is motivated by the model of Cocco (2004), where the purchase of a house can leave the individual with so little liquid wealth that paying the fixed cost to participate in the stock market is not worthwhile. Although the purchase of a home will mechanically leave a household with less money available to potentially invest in stocks, the household's wealth may be sufficiently inframarginal that the purchase does not push it from participation to non-participation.

Table XII shows that information costs—both the costs of staying up-to-date about stocks and the cost of learning about them in the first place—are the most important reasons why respondents felt that the money they have available is not enough to make investing in stocks worthwhile (45% and 41% rate these as very or extremely important, respectively). Costs of hiring and maintaining an adviser are close behind, at 39% and 37%, respectively.[16] The area where there is the largest gap between the up-front fixed cost and the ongoing fixed cost is with respect to investment accounts: 37% cite the costs of maintaining an account as very or extremely important, while 31% cite the costs of setting one up. A smaller fraction (28%) cite tax complexity. Finally, 27% of homeowners who cite fixed costs as very or extremely important report that home

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[16] Wealthy non-participants who rate fixed costs as very or extremely important are much more likely than non-wealthy non-participants to cite every cost except tax complexity as very or extremely important. However, since there are only 11 wealthy non-participants who rate fixed costs as very or extremely important, these figures should not be taken too seriously.

ownership is a very or extremely important factor in causing them not to have enough money to make it worthwhile to invest in stocks.

*H. Principal Component Analysis*

Do people who find certain factors important for their equity share decision also tend to find other related factors important? In this section, we describe the results of a principal component analysis conducted on the equity share factors in Table II that were asked of every respondent.[17] The outcome variables are binary indicators for whether the respondent rated each factor as very or extremely important.[18]

Using the common criterion of retaining only factors with an eigenvalue above 1, we find that six factors capture 54% of the variation in the data. To aid interpretation, we perform an orthogonal varimax rotation of the factors.[19] Following the suggestion of Tabachnick and Fidell (2007), we only consider loadings of at least 0.32 to be economically significant when interpreting the factors. However, in Table XIII, we show all factors whose loading on a principal component is at least 0.199, a cutoff that causes every factor except non-financial asset risk to be associated with at least one principal component.[20]

The first principal component seems to capture concern about neoclassical asset pricing factors: the consumption CAPM, long-run risk, and return covariance with marginal utility. The second principal component primarily captures belief that the aggregate stock market return is predictable. It loads on the belief that expected stock returns are lower than usual right now, retirement savings plan defaults, the belief that stock market returns mean-revert, and the belief

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[17] Note that principal components analysis does not tell us which factors are important determinants of equity share; it merely tells us whether respondents who rate certain factors as important tend to also rate certain other factors as important. Therefore, a factor could be highly ranked in Table 2 but not appear in bold in Table 13.

[18] The results are broadly similar if we instead use as outcome variables binary indicators for whether the respondent rated each factor as at least moderately important or the numerical coding of the factor ratings. Using the standardized numerical ratings as outcome variables yields rather different results, resulting in eleven principal components with an eigenvalue above 1.

[19] An oblique promax rotation yields virtually identical results.

[20] Non-financial asset risk loads most heavily (0.17) on the third principal component.

that stock market returns have momentum. Although a positive association between these last two factors might seem contradictory, this need not be so if, for example, respondents thought the market is subject to both short-term reversals and long-run momentum—consistent with the empirical fact that individuals are net sellers of stocks with high returns over the past quarter and net buyers of stocks with more distant high past returns (Grinblatt and Keloharju (2000, 2001), Griffin et al. (2003), Kaniel et al. (2008), Barber et al. (2009)).

The third principal component loads on consumption needs, habit, and human capital: consumption commitments, time until a significant non-retirement expense, internal habit, and human capital as a fraction of total wealth. The fourth principal component is associated with discomfort with the market: a lack of knowledge about how to invest, ambiguity and parameter uncertainty, a lack of a trustworthy adviser, and loss aversion. The fifth principal component loads on advice: advice from the media and advice from a friend, family member, or coworker. The final principal component loads on personal experience with returns and stock investing.

The fact that responses to the equity share factor questions have a sensible correlation structure is further evidence that respondents were answering in a thoughtful, coherent manner.

For completeness, we explore via regressions how individuals' equity share relates to their first six principal component scores, using either ordinary least squares or tobit regressions where the dependent variable is considered censored at 0% and 100%. The first and third columns of Table XIV show that when only the principal components are used as explanatory variables, those who report that neoclassical asset pricing factors and discomfort with the market were more important invest less in stocks, whereas those who report that a belief in market return predictability, defaults, and personal experience were more important invest more in stocks. The relationship of equity share with the third principal component (consumption needs, habit, and human capital) and fifth principal component (advice) scores is negative but insignificant in both regressions. The results are qualitatively similar when we additionally control for respondent demographics in the second and fourth columns, except that the relationship with personal experience loses significance. We caution that because a respondent's principal component scores may be correlated with other unobserved factors that affect portfolio allocation, such as risk

aversion, these regression coefficients should not necessarily be interpreted as the causal impact of placing more weight on the factors in each principal component.

*I. Description Complexity and Importance Ratings*

Although our pilot testing indicates that our questions were understood by nearly every respondent, it is still possible that some factor descriptions created more confusion than others. If people respond to a confusing factor description by rating the factor as less important than it really is, our estimate of the factor's overall importance will be downwardly biased. Conversely, a confusing factor description could cause a respondent to rate it as more important than it really is in order to try to appear sophisticated to the researchers, even though the survey was administered remotely through the Internet with no respondent identities revealed to us.

We look for a relationship between factor importance ratings and factor description complexity by measuring complexity in two ways: the number of words used to describe the factor, and the factor description's Fleisch-Kincaid grade level score.[21] Taking all the factors in Table II for which every respondent gave an importance rating, we regress the fraction who said the factor was very or extremely important on either the word count (standard deviation = 9.5) or the grade level score (standard deviation = 4.0). There is no evidence of a significant relationship. The coefficient is 0.14 with a *t*-statistic of 0.86 ($p = 0.39$) for word count, and 0.024 with a *t*-statistic of 0.06 ($p = 0.95$) for grade level score (where the dependent variable's units are such that 1% is coded as 1, not 0.01). These null results suggest that our survey responses are not being driven by the complexity of the questions.

## II. Actively Managed Mutual Funds

The second section of our survey explores the reasons why individuals purchase actively managed equity mutual funds. The amount of investment in active management is puzzling given that passive funds in aggregate outperform active funds (e.g., Gruber (1996), French (2008), Fama

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[21] The Fleisch-Kincaid grade level is computed by the formula 0.39 × (total words/total sentences) + 11.8 × (total syllables/total words) – 15.59.

and French (2010)). French (2008) hypothesizes that investors misperceive the relative returns to active management versus passive management as a whole, or are overconfident about their ability to pick outperforming active managers. Del Guercio and Reuter (2014) find that underperformance in active management is concentrated in funds sold through brokers, suggesting that much investment in active funds is the result of an agency problem that causes brokers to advise clients to invest in poorly performing funds. Moskowitz (2000), Glode (2011), Kosowski (2011), and Savov (2014) argue that investment in active funds could be rational despite their lower average returns, since active funds outperform in states of the world where marginal utility is high. In the model of Berk and Green (2004), active management should on average match passive management returns. Managers have heterogeneous skill in generating alpha, and this skill has decreasing returns to scale. In equilibrium, there is neither persistence in alphas nor outperformance of active management because money rationally flows to funds with high past returns (and exits funds with low past returns) up to the point where every manager's alpha going forward is the same in expectation.

We ask questions related to each of the above explanations. We begin by asking whether the respondent knows what a mutual fund is. Fifty-five percent of respondents told us that they did. We then show all respondents the definition of a mutual fund, an actively managed stock mutual fund, and a passively managed stock mutual fund.[22] We next ask whether respondents have ever purchased shares in an actively managed stock mutual fund.[23] The 35% who say yes are asked to rate the importance of four factors in their decision to do so. First, we ask about the importance of a belief that the active fund would give them higher returns on average than a passive fund ("higher returns"). Second, we ask about the importance of the recommendations of an investment

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[22] We give the following definitions: "A mutual fund is a company that brings together money from many people and invests it in stocks, bonds or other assets. In an actively managed stock mutual fund, the fund manager tries to beat the overall stock market's return by picking stocks to buy. In contrast, a passively managed stock mutual fund (also known as a stock index fund) holds stocks in order to match the performance of a market benchmark (such as the S&P 500 stock market index) as closely as possible."
[23] Among respondents who reported not knowing what a mutual fund is, only 40 say they have bought an actively managed stock mutual fund after being told the definition of a mutual fund.

adviser that they hired ("adviser recommendation"). Third, we ask about the importance of the belief that even though the active fund would have lower returns than a passive fund on average, it would have higher returns when the economy is doing poorly ("hedging"). Fourth, in light of the importance of employer-sponsored retirement savings plans in many individuals' financial lives, we ask about the importance of a suitable passive fund not being available within the investment menu of their employer-sponsored retirement savings plan ("passive not available").

We ask all respondents, whether or not they had invested in an active fund before, how much they agreed with the statement that when an actively managed stock mutual fund has had significantly higher past returns than the overall stock market, this is strong evidence that its manager has good stock-picking skills ("managerial skill"). Answer options are "strongly disagree," "disagree," "neither agree nor disagree," "agree," and "strongly agree." We also ask how much respondents agreed with the statement that when an actively managed stock mutual fund gets more money to manage, it becomes harder for it to generate higher returns than the overall stock market ("decreasing returns to scale").

The results are summarized in Table XV. By far the most important motivators of active fund purchase are a belief that they would supply higher returns on average (cited as very or extremely important by 51% of respondents who had experience with actively managed equity mutual funds) and the recommendation of a financial adviser (cited by 48% of eligible respondents). Hedging demand has non-trivial support, described as very or extremely important by 27% of eligible respondents. A lack of passive funds in a retirement savings plan investment menu is the least important factor, with only 18% describing this as very or extremely important.

Regarding the assumptions of Berk and Green (2004), 46% of respondents agree or strongly agree that past returns are evidence of skill, but only 18% agree or strongly agree that there are decreasing returns to scale in active money management. High-wealth respondents are substantially more likely than low-wealth respondents to believe that high past returns are strong evidence of skill (56% versus 41%), and modestly more likely to believe in decreasing returns to scale (25% versus 15%).

## III. Cross-Section of Equity Returns

Differences in expected returns across stock portfolios formed on value and momentum are well established (Fama and French (1992), Jegadeesh and Titman (1993)), but whether these differences are driven by mispricing or rational responses to risk remains controversial. In the final section of the survey, we investigate what our respondents believe about the expected returns and risks of value and momentum stocks.

We begin by asking respondents whether they are familiar with the terms "growth stock" and "value stock." Twenty-five percent report being familiar with both, 68% report not being familiar with either term, and 5% report being familiar with only one of the terms. We then show a simple definition of a growth stock and of a value stock.[24]

Next, we ask respondents to complete the following sentence about the relative risk of growth versus value: "Compared to a growth stock, I expect a value stock to normally be…" Respondents choose among four possible answers: "riskier over the next year, on average," "equally risky over the next year, on average," "less risky over the next year, on average," and "no opinion." We ask them to complete another sentence about the relative expected return of growth versus value: "Compared to a growth stock, I expect a value stock to normally have..." Here, the answer choices are "higher returns over the next year, on average," "about the same returns over the next year, on average," "lower returns over the next year, on average," and "no opinion." We also ask respondents to complete two similar sentences about the risk and expected returns of high- versus low-momentum stocks, this time comparing "a stock whose price fell a lot over the past year" to "a stock whose price rose a lot over the past year."

Table XVI shows that respondents' collective belief about the relationship between value/growth and expected returns differs from the historical empirical relationship.[25] Slightly more expect value stocks to normally have *lower* returns (28%) rather than higher returns (25%),

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[24] We give the following definitions: "A value stock is a stock that has a low price relative to its company's current profits (and other fundamentals). A growth stock is a stock that has a high price relative to its company's current profits (and other fundamentals)."

[25] This difference need not be irrational, since we ask about forward-looking expectations, and rational expectations of future returns may not coincide with historical realizations.

but this difference is not statistically significant. More consistent with the historical data is respondents' tendency to expect high-momentum stocks to normally have higher returns rather than lower returns (24% versus 14%). There is comparatively broad consensus that value stocks are less risky (44%) rather than more risky (14%), while respondents are only modestly more likely to expect high-momentum stocks to normally be riskier (25%) rather than less risky (14%). So in aggregate, our respondents believe that value stocks are a good deal, having lower risk than but similar expected returns to growth stocks, while the relative merits of high-momentum stocks are more ambiguous. We note that for each of these questions, about a quarter of respondents state they have no opinion.

Value stocks are seen as even more appealing among those who have at least $100,000 in investible assets. Wealthy investors are more likely to believe that value stocks have higher expected returns (28%) rather than lower expected returns (22%), although the difference is not significant, and they strongly believe that value stocks are less risky (54%) rather than more risky (16%). Wealthy investors tend to believe that high-momentum stocks have higher expected returns (26%) rather than lower expected returns (20%), but by a smaller margin than the overall sample. Like the overall sample, wealthy investors are more likely to think that high-momentum stocks are more risky (24%) rather than less risky (14%).

We investigate using regressions whether respondents' answers to these questions vary with demographics more generally. Betermier, Calvet, and Sodini (2017) find that older, wealthier, and female Swedish investors tend to exhibit greater portfolio tilts towards value stocks, whereas investors with higher current labor income and education tend to exhibit greater portfolio tilts away from value stocks. We construct three dummy variables for whether the respondent said that value stocks have (1) higher expected returns than growth stocks, (2) higher risk than growth stocks, or (3) higher expected returns than growth stocks without higher risk than growth stocks, or equal expected returns as but lower risk than growth stocks.[26] This third variable captures the perception

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[26] The third dummy variable is coded as 0 if the respondent reported no opinion about or did not respond to the questions regarding relative expected returns and risk.

that value stocks have higher risk-adjusted expected returns than growth stocks.[27] We construct three analogous variables for high-momentum stocks relative to low-momentum stocks. The explanatory variables are respondent age in years and dummies for having at least a bachelor's degree, having at least $100,000 in investible financial assets, having household income of at least $100,000, and being female. The results are presented in Table XVII.

We find no significant demographic correlates of stating that value stocks have higher expected returns or that value stocks are riskier. However, we do find that wealthier respondents are more likely to say that value stocks have higher risk-adjusted returns, consistent with the holding pattern found by Betermeier, Calvet, and Sodini (2017). Of course, these sorts of perceptions will have imperfect mappings to portfolio holdings, as individuals may misperceive which stocks are value stocks, beliefs about value stocks in general may not apply to the particular value stocks that an individual chooses to hold, and portfolio holdings in equilibrium depend not just on perceptions of risk and return but also one's risk tolerance relative to other investors.

Turning to momentum, we find no significant correlates of stating that high-momentum stocks have higher expected returns, but younger and male respondents are more likely to regard high-momentum stocks to be riskier than low-momentum stocks. We also find that older individuals are more likely to say that high-momentum stocks have better risk-adjusted returns than low-momentum stocks.

### IV. Conclusion

In our survey of primary household financial decision-makers in the U.S., we find that individuals consider a wide variety of factors hypothesized in the academic literature when deciding what fraction of their portfolio to invest in stocks. We find particularly strong support for background risks, investment horizon, rare disasters, transactional factors, and fixed costs of stock market participation, but many other factors garner significant support as well. The largest drivers of investing in active equity mutual funds are a belief that they will provide higher average returns

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[27] This variable does not, however, capture the perception that value stocks have higher risk-adjusted expected returns than growth stocks while also having higher risk than growth stocks.

than passive funds and the advice of a professional investment adviser. Households tend to believe that past fund performance is a good signal of stock-picking skill, but contrary to Berk and Green (2004), do not generally believe that funds suffer from diseconomies of scale. Regarding the cross-section of stock returns, households tend to believe that value stocks will be safer and (contrary to historical data) do not have higher expected returns, and that high-momentum stocks will be riskier and (consistent with historical data) have higher expected returns.

## REFERENCES

Angerer, Xiaohong, and Pok-Sang Lam, 2009, Income risk and portfolio choice: An empirical study. *Journal of Finance* 64, 1037-1055.

Bansal, Ravi, Dana Kiku, and Amir Yaron, 2012, An empirical evaluation of the long-run risks model for asset prices, *Critical Finance Review* 1, 183-221.

Bansal, Ravi, and Amir Yaron, 2004, Risks for the long run: A potential resolution of asset pricing puzzles, *Journal of Finance* 59, 1481-1509.

Barber, Brad M., Yi-Tsung Lee, Yu-Jane Liu, and Terrance Odean, 2009, Just how much do individual investors lose by trading?, *Review of Financial Studies* 22, 609-632.

Barberis, Nicholas, 2000, Investing for the long run when returns are predictable, *Journal of Finance* 55, 225-264.

Barberis, Nicholas, Robin Greenwood, Lawrence Jin, and Andrei Shleifer, 2015, X-CAPM: An extrapolative capital asset pricing model, *Journal of Financial Economics* 115, 1-24.

Barberis, Nicholas, and Ming Huang, 2008, Stocks as lotteries: The implications of probability weighting for security prices, *American Economic Review* 98, 2066-2100.

Barberis, Nicholas, Ming Huang, and Tano Santos, 2001, Prospect theory and asset prices, *Quarterly Journal of Economics* 116, 1-53.

Barberis, Nicholas, Ming Huang, and Richard H. Thaler, 2006, Individual preferences, monetary gambles, and stock market participation: A case for narrow framing, *American Economic Review* 96, 1069-1090.

Barro, Robert J., 2006, Rare disasters and asset markets in the twentieth century, *Quarterly Journal of Economics* 121, 823-866.

Barro, Robert J., and José F. Ursúa, 2012, Rare macroeconomic disasters, *Annual Review of Economics* 4, 83-109.

Barsky, Robert B., F. Thomas Juster, Miles S. Kimball, and Matthew D. Shapiro, 1997, Preference parameters and behavioral heterogeneity: An experimental approach in the Health and Retirement Study, *Quarterly Journal of Economics* 112, 537–579.

Bender, Svetlana Gherzi, James J. Choi, Danielle Dyson, and Adriana Z. Robertson, 2019, Rich investors speak: What drives their personal investment decisions?, Working paper, Yale University.

Benjamin, Daniel J., Sebastian A. Brown, and Jesse M. Shapiro, 2010, Who is 'behavioral'? Cognitive ability and anomalous preferences, *Journal of the European Economic Association* 11, 1231–1255.

Benjamin, Daniel J., James J. Choi, and Geoffrey Fisher, 2016, Religious identity and economic behavior, *Review of Economics and Statistics* 98, 617-637.

Berk, Jonathan B., and Richard C. Green, 2004, Mutual fund flows and performance in rational markets, *Journal of Political Economy* 112, 1269-1295.

Betermier, Sebastien, Laurent E. Calvet, and Paolo Sodini, 2017, Who are the value and growth investors?, *Journal of Finance* 72, 5-46.

Bewley, Truman, 1999, *Why wages don't fall during a recession* (Harvard University Press, Cambridge, MA).

Bodie, Zvi, 1976, Common stocks as a hedge against inflation, *Journal of Finance* 31, 459-470.

Bodie, Zvi, Robert C. Merton, and William F. Samuelson, 1992, Labor supply flexibility and portfolio choice in a life cycle model, *Journal of Economic Dynamics and Control* 16, 427-449.

Boudoukh, Jacob, and Matthew Richardson, 1993, Stock returns and inflation: A long-horizon perspective, *American Economic Review* 83, 1346-1355.

Brav, Alon, John R. Graham, Campbell R. Harvey, and Roni Michaely, 2005, Payout policy in the 21st century, *Journal of Financial Economics* 77, 483-527.

Breeden, Douglas T., 1979, An intertemporal asset pricing model with stochastic consumption and investment opportunities, *Journal of Financial Economics* 7, 265-296.

Breeden, Douglas T., and Robert H. Litzenberger, 1978, Prices of state-contingent claims implicit in option prices, *Journal of Business* 51, 621-651.

Bricker, Jesse, Lisa J. Dettling, Alice Henriques, Joanne W. Hsu, Kevin B. Moore, John Sabelhaus, Jeffrey Thompson, and Richard A. Windles, 2014, Changes in U.S. family finances from 2010 to 2013: Evidence from the Survey of Consumer Finances, *Federal Reserve Bulletin* 100(4).

Burchell, Brendan J., 2003, Identifying, describing and understanding financial aversion: Financial phobes, Report for EGG.

Campbell, John Y., and John H. Cochrane, 1999, By force of habit: A consumption-based explanation of aggregate stock market behavior, *Journal of Political Economy* 107, 205-251.

Carroll, Gabriel D., James J. Choi, David Laibson, Brigitte C. Madrian, and Andrew Metrick, 2009, Optimal defaults and active decisions, *Quarterly Journal of Economics* 124, 1639-1674.

Chetty, Raj, László Sándor, and Adam Szeidl, 2017, The effect of housing on portfolio choice, *Journal of Finance* 72, 1171-1212.

Chetty, Raj, and Adam Szeidl, 2007, Consumption commitments and risk preferences, *Quarterly Journal of Economics* 122, 831-877.

Chetty, Raj, and Adam Szeidl, 2016, Consumption commitments and habit formation, *Econometrica* 84, 855-890.

Cheung, Yin-Wong, and Menzie D. Chinn, 2001, Currency traders and exchange rate dynamics: A survey of the US market, *Journal of International Money and Finance* 20, 439-471.

Cheung, Yin-Wong, Menzie D. Chinn, and Ian W. Marsh, 2004, How do UK-based foreign exchange dealers think their market operates?, *International Journal of Finance and Economics* 9, 289-306.

Cheung, Yin-Wong, and Clement Yuk-Pang Wong, 2000, A survey of market practitioners' views on exchange rate dynamics, *Journal of International Economics* 51, 401-419.

Choi, James J., David Laibson, Brigitte C. Madrian, and Andrew Metrick, 2002, Defined contribution pensions: Plan rules, participant choices, and the path of least resistance, *Tax Policy and the Economy* 16, 67-113.

Choi, James J., David Laibson, Brigitte C. Madrian, and Andrew Metrick, 2004, For better or for worse: Default effects and 401(k) savings behavior, in David A. Wise, ed.: *Perspectives on the Economics of Aging* (University of Chicago Press, Chicago, IL).

Cochrane, John H., 2017, Macro-finance, *Review of Finance* 21, 945-985.

Cocco, Joao F., 2005, Portfolio choice in the presence of housing, *Review of Financial Studies* 18, 535-567.

Constantinides, George M., 1990, Habit formation: A resolution of the equity premium puzzle, *Journal of Political Economy* 98, 519-543.

Copeland, Craig, 2013, Retirement plan participation: Survey of Income and Program Participation (SIPP) data, 2012, *EBRI Notes* 34(8).

DeBondt, Werner, 1993, Betting on trends: Intuitive forecasts of financial risk and return, *International Journal of Forecasting* 9, 355-371.

Del Guercio, Diane, and Jonathan Reuter, 2014, Mutual fund performance and the incentive to generate alpha, *Journal of Finance* 69, 1673-1704.

Dimmock, Stephen G., and Roy Kouwenberg, 2010, Loss-aversion and household portfolio choice, *Journal of Empirical Finance* 17, 441-459.

Dimmock, Stephen G., Roy Kouwenberg, Olivia S. Mitchell, and Kim Peijnenburg, 2016, Ambiguity aversion and household portfolio choice puzzles: Empirical evidence, *Journal of Financial Economics* 119, 559-577.

Dohmen, Thomas, Armin Falk, David Huffman, Jürgen Schupp, and Gert G. Wagner, 2011, Individual risk attitudes: Measurement, determinants, and behavioral consequences, *Journal of the European Economic Association* 9, 522–550.

Dow, James, and Sérgio Ribeiro da Costa Werlang, 1992, Uncertainty aversion, risk aversion, and the optimal choice of portfolio, *Econometrica* 60, 197-204.

Ellsberg, Daniel, 1961, Risk, ambiguity, and the Savage axioms, *Quarterly Journal of Economics* 75, 643-669.

Fagereng, Andreas, Luigi Guiso, and Luigi Pistaferri, 2018, Portfolio choices, firm shocks, and uninsurable wage risk, *Review of Economic Studies* 85, 437-474.

Fama, Eugene F., 1970, Efficient capital markets: A review of theory and empirical work, *Journal of Finance* 25, 383-417.

Fama, Eugene F., and Kenneth R. French, 1992, The cross-section of expected stock returns, *Journal of Finance* 47, 427-465.

Fama, Eugene F., and Kenneth R. French, 201,. Luck versus skill in the cross-section of mutual fund returns, *Journal of Finance* 65, 1915-1947.

Fama, Eugene F., and G. William Schwert, 1977, Asset returns and inflation, *Journal of Financial Economics* 5, 115-146.

Fisher, Kenneth, and Meier Statman, 2000, Investor sentiment and stock returns, *Financial Analysts Journal* 56(2), 16-23.

Flavin, Marjorie, and Takashi Yamashita, 2002, Owner-occupied housing and the composition of the household portfolio, *American Economic Review* 92, 345-362.

French, Kenneth R., 2008, Presidential address: The cost of active investing, *Journal of Finance* 63, 1537-1573.

Friedman, Milton, 1953, *Essays in Positive Economics* (University of Chicago Press, Chicago, IL).

Garlappi, Lorenzo, Raman Uppal, and Tan Wang, 2007, Portfolio selection with parameter and model uncertainty: A multi-prior approach, *Review of Financial Studies* 20, 41-81.

Glode, Vincent, 2011, Why mutual funds "underperform", *Journal of Financial Economics* 99, 546-559.

Gollier, Christian, and John W. Pratt, 1996, Risk vulnerability and the tempering effect of background risk, *Econometrica* 64, 1109-1123.

Goetzmann, William N., Dasol Kim, and Robert J. Shiller, 2016, Crash beliefs from investor surveys, NBER Working Paper 22143.

Gompers, Paul, William Gornall, Steven N. Kaplan, and Ilya A. Strebulaev, 2016, How do venture capitalists make decisions? NBER Working Paper 22587.

Gompers, Paul, Steven N. Kaplan, and Vladimir Mukharlyamov, 2016, What do private equity firms say they do?, *Journal of Financial Economics* 121, 449-476.

Graham, John R., and Campbell R. Harvey, 2001, The theory and practice of corporate finance: Evidence from the field, *Journal of Financial Economics* 60, 187-243.

Graham, John R., Campbell R. Harvey, and Shiva Rajgopal, 2005, The economic implications of corporate financial reporting, *Journal of Accounting and Economics* 40, 5-73.

Greenwood, Robin, and Andrei Shleifer, 2014, Expectations of returns and expected returns, *Review of Financial Studies* 27, 714-746.

Griffin, John M., Jeffrey H. Harris, and Selim Topaloglu, 2003, The dynamics of institutional and individual trading, *Journal of Finance* 58, 2285-2320.

Grinblatt, Mark, and Matti Keloharju, 2000, The investment behavior and performance of various investor types: A study of Finland's unique data set, *Journal of Financial Economics* 55, 43-67.

Grinblatt, Mark, and Matti Keloharju, 2001, What makes investors trade?, *Journal of Finance* 56, 589-616.

Gruber, Martin J., 1996, Another puzzle: The growth in actively managed mutual funds, *Journal of Finance* 51, 783-810.

Guiso, Luigi, Tullio Jappelli, and Daniele Terlizzese, 1996, Income risk, borrowing constraints, and portfolio choice, *American Economic Review* 86, 158-172.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales, 2003, People's opium? Religion and economic attitudes, *Journal of Monetary Economics* 50, 225-282.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales, 2008, Trusting the stock market, *Journal of Finance* 63, 2557-2600.

Guletkin, N. Bulent, 1983, Stock market returns and inflation: Evidence from other countries, *Journal of Finance* 38, 49-65.

Harris, Katherine M., and Michael P. Keane, 1998, A model of health plan choice: Inferring preferences and perceptions from a combination of revealed preference and attitudinal data, *Journal of Econometrics* 89, 131-157.

Hausman, Daniel M., 1992, Why look under the hood?, in *Essays on Philosophy and Economic Methodology* (Cambridge University Press, Cambridge, UK).

Heaton, John, and Deborah Lucas, 2000, Portfolio choice and asset prices: The importance of entrepreneurial risk, *Journal of Finance* 55, 1163-1198.

Hilary, Gilles, and Kai Wai Hui, 2009, Does religion matter in corporate decision making in America?, *Journal of Financial Economics* 93, 455–473.

Hochguertel, Stefan, 2003, Precautionary motives and portfolio decisions, *Journal of Applied Econometrics* 18, 61-77.

Jegadeesh, Narasimhan, and Sheridan Titman, 1993, Returns to buying winners and selling losers: Implications for stock market efficiency, *Journal of Finance* 48, 65-91.

Kahneman, Daniel, and Amos Tversky, 1979, Prospect theory: An analysis of decision under risk, *Econometrica* 47, 263-292.

Kan, Raymond, and Guofu Zhou, 2007, Optimal portfolio choice with parameter uncertainty, *Journal of Financial and Quantitative Analysis* 42, 621-656.

Kaniel, Ron, Gideon Saar, and Sheridan Titman, 2008, Individual investor trading and stock returns, *Journal of Finance* 63, 273-310.

Kimball, Miles S., 1993, Standard risk aversion, *Econometrica* 61, 589-611.

Kosowski, Robert, 2011, Do mutual funds perform when it matters most to investors? US mutual fund performance and risk in recessions and expansions, *Quarterly Journal of Finance* 1, 607-664.

Kozak, Serhiy, Stefan Nagel, and Shrihari Santosh, 2018, Interpreting factor models, *Journal of Finance* 73, 1183-1223.

Kumar, Alok, 2009, Who gambles in the stock market?, *Journal of Finance* 64, 1889-1933.

Kumar, Alok, Jeremy Page, and Oliver Spalt, 2011, Religious beliefs, gambling attitudes, and financial market outcomes, *Journal of Financial Economics* 102, 671-708.

Lagos, Ricardo, 2010, Asset prices and liquidity in an exchange economy, *Journal of Monetary Economics* 57, 913-930.

Laibson, David, 1997, Golden eggs and hyperbolic discounting, *Quarterly Journal of Economics* 112, 443-477.

Lintner, John, 1956, Distribution of incomes of corporations among dividends, retained earnings, and taxes, *American Economic Review* 46, 97-113.

Lintner, John, 1975, Inflation and stock returns, *Journal of Finance* 30, 259-280.

Lucas, Robert E., 1978, Asset prices in an exchange economy, *Econometrica* 46, 1429-1445.

Madrian, Brigitte C., and Dennis F. Shea, 2001, The power of suggestion: Inertia in 401(k) participation and savings behavior, *Quarterly Journal of Economics* 116, 1149-1187.

Malhotra, Neil, 2008, Completion time and response order effects in web surveys, *Public Opinion Quarterly* 72, 914-934.

Malmendier, Ulrike, and Stefan Nagel, 2011, Depression babies: Do macroeconomic experiences affect risk taking?, *Quarterly Journal of Economics* 126, 373-416.

Mehra, Rajnish, and Edward C. Prescott, 1985, The equity premium: A puzzle, *Journal of Monetary Economics* 15, 145-161.

Moskowitz, Tobias, 2000, Mutual fund performance: An empirical decomposition into stock-picking talent, style, transactions costs, and expenses: Discussion, *Journal of Finance* 55, 1695-1703.

Nelson, Charles R., 1976, Inflation and rates of return on commons stocks, *Journal of Finance* 31, 471-483.

O'Donoghue, Ted, and Matthew Rabin, 1999, Doing it now or later, *American Economic Review* 89, 103-124.

Palia, Darius, Yaxuan Qi, and Yangru Wu, 2014, Heterogeneous background risks and portfolio choice: Evidence from micro-level data, *Journal of Money, Credit and Banking* 46, 1687-1720.

Piazzesi, Monika, Martin Schneider, and Selale Tuzel, 2007, Housing, consumption and asset pricing, *Journal of Financial Economics* 83, 531-569.

Pratt, John W., and Richard J. Zeckhauser, 1987, Proper risk aversion, *Econometrica* 55, 143-154.

Putnam, Robert, 1993, *Making Democracy Work: Civic Traditions in Modern Italy (*Princeton University Press, Princeton, NJ).

Rabin, Matthew, 2000, Risk aversion and expected-utility theory: A calibration theorem, *Econometrica* 68, 1281-1292.

Rietz, Thomas A., 1988, The equity risk premium: A solution, *Journal of Monetary Economics* 22, 117-131.

Rosen, Harvey S., and Stephen Wu, 2004, Portfolio choice and health status, *Journal of Financial Economics* 72, 457-484.

Rubenstein, Mark, 1976, The valuation of uncertain income streams and the pricing of options, *Bell Journal of Economics* 7, 407-425.

Samuelson, William, and Richard Zeckhauser, 1988, Status quo bias in decision making, *Journal of Risk and Uncertainty* 1, 7-59.

Savov, Alexi, 2014, The price of skill: Performance evaluation by households, *Journal of Financial Economics* 112, 213-231.

Schmidt, Lawrence D. W., 2016, Climbing and falling off the ladder: Asset pricing implications of labor market event risk, Working paper, MIT.

Schneider, Christoph, and Oliver Spalt, 2016, Conglomerate investment, skewness, and the CEO long shot bias, *Journal of Finance* 71, 635-672.

Schneider, Christoph, and Oliver Spalt, 2017, Acquisitions as lotteries: Do managerial gambling attitudes influence takeover decisions?, *Critical Finance Review* 6, 77-132.

Segal, Uzi, and Avia Spivak, 1990, 'First order versus second order risk aversion, *Journal of Economic Theory* 51, 111-125.

Shapiro, Gilla K., and Brendan J. Burchell, 2012, Measuring financial anxiety, *Journal of Neuroscience, Psychology, and Economics* 5, 92-103.

Shu, Tao, Johan Sulaeman, and P. Eric Yeung, 2012, Local religious beliefs and mutual fund risk-taking behaviors, *Management Science* 58, 1779-1796.

Solnik, Bruno, and Vincent Solnik, 1997, A multi-country test of the Fisher model for stock returns, *Journal of International Financial Markets* 7, 289-301.

Tabachnick, Barbara G., and Linda S. Fidell, 2007, *Using Multivariate Statistics,* 5th edition (Pearson Education, Inc., Boston, MA).

Vanguard. 2014, *How America saves 2014: A report on Vanguard 2013 defined contribution plan data* (Vanguard Group, Valley Forge, PA).

Vissing-Jørgensen, Annette, 2003, Perspectives on behavioral finance: Does 'irrationality' disappear with wealth? Evidence from expectations and actions, *NBER Macroeconomics Annual* 18, 139-194.

Wachter, Jessica A., 2002, Portfolio and consumption decisions under mean-reverting returns: An exact solution for complete markets, *Journal of Financial and Quantitative Analysis* 37, 63-91.

Weber, Max, 1930, *The Protestant Ethic and the Spirit of Capitalism* (Allen and Unwin, London).

Yao, Rui, and Harold H. Zhang, 2005, Optimal consumption and portfolio choices with risky housing and borrowing constraints, *Review of Financial Studies* 18, 197-239.

**Table I**
**Unweighted Sample Summary Statistics**

This table shows the unweighted percent of our respondents who have various characteristics, and stock market participation rates conditional on having each characteristic. Variables other than homeownership, employment status, investible financial assets, and stock ownership were not collected in our survey, but were previously measured by the ALP for our respondents.

| | % of sample | % who own stocks | | % of sample | % who own stocks |
|---|---|---|---|---|---|
| Male | 47.9% | 70.5% | Own home they live in | 71.9% | 75.9% |
| Age | | | Employment status | | |
| 21-29 | 3.2% | 40.6% | Working | 54.7% | 74.0% |
| 30-39 | 11.5% | 50.0% | Unemployed, looking for work | 4.4% | 28.9% |
| 40-49 | 14.0% | 62.0% | Temporarily laid off, on sick or | 1.0% | 55.6% |
| 50-59 | 24.8% | 71.5% | other leave | | |
| 60-69 | 28.9% | 69.7% | Disabled | 8.4% | 23.8% |
| 70+ | 17.7% | 70.4% | Retired | 30.9% | 70.6% |
| Living situation | | | Homemaker | 6.6% | 49.2% |
| Married or living with partner | 59.0% | 73.1% | Household income | | |
| Separated | 2.6% | 53.8% | < $15,000 | 9.8% | 13.4% |
| Divorced | 16.3% | 57.3% | $15,000 - $24,999 | 9.3% | 26.6% |
| Widowed | 6.7% | 56.7% | $25,000 - $49,999 | 22.4% | 60.3% |
| Never married | 15.4% | 53.9% | $50,000 - $74,999 | 20.6% | 72.5% |
| Education | | | $75,000 - $99,999 | 12.5% | 82.4% |
| < High school | 2.4% | 43.5% | $100,000 - $124,999 | 10.1% | 86.3% |
| High school diploma or equiv. | 11.1% | 45.0% | $125,000 - $199,999 | 10.5% | 94.3% |
| Some college, no degree | 23.0% | 50.0% | $200,000+ | 4.7% | 97.9% |
| Associate degree | 12.5% | 58.7% | Investible financial assets | | |
| Bachelor's degree | 26.2% | 77.3% | $0 | 6.6% | 4.5% |
| Graduate degree | 24.9% | 83.7% | $1 - $999 | 7.1% | 5.6% |
| Race | | | $1,000 - $4,999 | 6.5% | 21.2% |
| White | 82.5% | 70.0% | $5,000 - $9,999 | 5.1% | 36.5% |
| Black | 9.6% | 42.1% | $10,000 - $24,999 | 8.5% | 59.0% |
| American Indian | 0.9% | 33.3% | $25,000 - $49,999 | 7.5% | 67.1% |
| Asian | 2.3% | 60.9% | $50,000 - $74,999 | 6.2% | 82.5% |
| Hispanic or Latino | 12.0% | 42.1% | $75,000 - $99,999 | 5.0% | 78.4% |
| | | | $100,000+ | 47.3% | 90.4% |

## Table II
## Summary of Importance of Equity Allocation Factors

The first column shows the percent of respondents ($N = 1,013$) who described the factor as very or extremely important. The second shows the percent of respondents who described the factor as at least moderately important. The third column shows the mean response, where the responses are translated into a five-point scale: not important = 1, a little important = 2, moderately important = 3, very important = 4, and extremely important = 5. The fourth column shows the average value of a standardized variable designed to capture whether a respondent indicated that a factor is important relative to the other factors. This variable is constructed by subtracting the mean numerical value of the respondent's ratings from the numerical value of each response and dividing by the standard deviation of that respondent's rating numerical values. All statistics are calculated using sampling weights.

| | Very or extremely important | Moderately important or more | Mean rating | Mean standardized rating |
|---|---|---|---|---|
| Wealth too small to invest in stocks * | 48.9% | 58.0% | 2.98 | 0.32 |
| Years left until retirement *** | 47.5% | 67.3% | 3.14 | 0.42 |
| Risk of illness/injury | 47.3% | 71.6% | 3.28 | 0.65 |
| Need cash on hand for routine expenses | 47.2% | 69.0% | 3.19 | 0.48 |
| Rare disaster risk | 45.5% | 70.2% | 3.22 | 0.53 |
| Labor income risk *** | 41.6% | 64.8% | 3.04 | 0.36 |
| Lack of trust in market participants | 37.5% | 59.9% | 2.91 | 0.21 |
| Don't like to think about my finances * | 37.3% | 57.0% | 2.82 | 0.26 |
| Lack of knowledge about how to invest | 36.2% | 61.4% | 2.87 | 0.19 |
| Human capital fraction of total wealth | 35.9% | 65.5% | 2.99 | 0.28 |
| Time until significant non-retirement expense | 35.7% | 59.1% | 2.84 | 0.17 |
| Consumption commitments | 35.5% | 61.7% | 2.93 | 0.24 |
| Return covariance with marginal utility of money | 35.2% | 60.6% | 2.87 | 0.20 |
| Lack of trustworthy adviser | 31.1% | 51.9% | 2.65 | -0.01 |
| Risk of aggregate consumption over next year | 30.3% | 58.4% | 2.76 | 0.09 |
| Risk of long-run aggregate consumption | 29.8% | 55.8% | 2.70 | 0.05 |
| Stocks take too long to convert to cash in emergency | 29.1% | 50.7% | 2.65 | 0.00 |
| Return covariance with marginal utility of consumption | 29.1% | 56.7% | 2.72 | 0.05 |
| Risk of aggregate consumption volatility over next year | 28.7% | 55.8% | 2.73 | 0.07 |
| Consumption composition risk | 28.6% | 52.5% | 2.68 | 0.03 |
| Home value risk **** | 28.5% | 54.3% | 2.77 | 0.24 |
| Loss aversion | 28.2% | 51.8% | 2.61 | -0.06 |
| Experience of living through stock market returns | 26.9% | 58.2% | 2.76 | 0.10 |
| Internal habit | 26.9% | 53.8% | 2.64 | -0.03 |
| Ambiguity / Parameter uncertainty | 26.7% | 55.7% | 2.63 | -0.02 |
| Advice from a professional financial adviser | 26.7% | 47.9% | 2.44 | -0.13 |
| Risk of long-run aggregate consumption volatility | 26.3% | 53.5% | 2.67 | 0.01 |
| Personal experience investing in stock market | 25.8% | 54.8% | 2.66 | 0.01 |
| Default allocation in retirement savings plan | 25.7% | 53.5% | 2.57 | -0.08 |
| Religious beliefs, values, and experiences | 25.6% | 43.1% | 2.40 | -0.24 |
| Expected stock returns lower than usual right now | 25.2% | 47.6% | 2.52 | -0.13 |
| Expected stock returns higher than usual right now ** | 24.3% | 55.6% | 2.64 | -0.05 |
| Stocks are an inflation hedge ** | 20.4% | 57.3% | 2.63 | -0.04 |
| Non-financial assets cushion losses in financial assets ** | 19.6% | 50.5% | 2.55 | -0.14 |
| Non-financial asset risk | 19.2% | 39.9% | 2.21 | -0.43 |
| Stock market returns have momentum | 18.7% | 42.0% | 2.36 | -0.29 |
| Stock market returns mean-revert | 17.2% | 44.9% | 2.37 | -0.26 |
| External habit | 16.3% | 41.5% | 2.28 | -0.38 |
| Stock market returns before I was born | 15.9% | 37.4% | 2.23 | -0.41 |
| Advice from a friend, family member, or coworker | 15.3% | 41.0% | 2.24 | -0.39 |
| Rule of thumb | 12.7% | 36.5% | 2.13 | -0.46 |
| Advice from media | 11.9% | 36.6% | 2.10 | -0.51 |
| Intended to invest in stocks but never got around to it * | 3.2% | 23.0% | 1.64 | -0.97 |

* Among stock market non-participants only ($N = 342$). ** Among stock market participants only ($N = 664$).

*** Among employed respondents only ($N = 715$). **** Among homeowners only ($N = 728$).

# Table III
## Background Risks and Assets

This table presents the percent of respondents who described the factor in the first column as very or extremely important, either for the entire sample or split by stock market participation, wealth (at least or below $100,000 in investible financial assets), and education (with or without a bachelor's degree). Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | Survey Text | All | Participant | | Wealth | | Education | |
|---|---|---|---|---|---|---|---|---|
| | | | Yes | No | High | Low | High | Low |
| Wealth too small* | The amount of money I have available to invest in stocks is too small | 48.9% (5.5) | --- | 48.9% (5.5) | 19.0% (7.8) | 51.5% (5.8) | 73.7% (5.9) | 43.9% (6.5) |
| Years left until retirement*** | The number of years I (and my spouse/partner, if applicable) have left until retirement | 47.5% (3.5) | 58.7% (3.7) | 30.1% (5.3) | 60.3% (4.2) | 41.1% (4.5) | 48.4% (4.4) | 47.0% (4.8) |
| Risk of illness/injury | The risk of expenses due to illness or injury to me or someone else in my family | 47.3% (3.0) | 47.7% (3.3) | 46.9% (5.5) | 48.1% (3.8) | 46.9% (4.1) | 36.9% (3.4) | 52.3% (3.9) |
| Labor income risk*** | Concern that I (or my spouse/partner, if applicable) might become unemployed, receive a pay cut, or not receive an expected pay increase | 41.6% (3.7) | 39.7% (3.9) | 45.8% (7.1) | 35.4% (4.5) | 44.8% (4.9) | 33.2% (3.9) | 46.3% (5.0) |
| Human capital | The difference between how much money I have available to invest right now and all the money I (and my spouse/partner, if applicable) expect to earn in wages over the rest of my life | 35.9% (3.0) | 31.5% (3.2) | 42.4% (5.6) | 32.5% (3.9) | 37.6% (4.1) | 30.9% (3.7) | 38.3% (4.1) |
| Time until significant non-retirement expense | How soon I will have significant expenses (like a car purchase, a down payment on a home, school tuition, etc.) | 35.7% (2.8) | 36.1% (3.4) | 35.6% (4.8) | 28.5% (3.6) | 39.5% (3.9) | 38.2% (3.9%) | 34.6% (3.7) |
| Home value risk**** | Concern that my home value might fall | 28.5% (2.7) | 26.6% (3.1) | 33.2% (5.3) | 29.1% (3.8) | 28.0% (3.7) | 20.0% (2.9) | 33.9% (3.9) |
| Stocks are an inflation hedge** | A belief that stocks are attractive because when my living expenses increase unexpectedly, the stock market will tend to rise | 20.4% (2.9) | 20.4% (2.9) | --- | 20.4% (4.1) | 20.4% (4.1) | 11.5% (2.5) | 27.6% (4.6) |
| Non-financial assets cushion losses in financial assets** | A belief that I can afford to take more risks in my financial portfolio because my non-financial assets (such as my home or small business) will cushion me against losses in my financial portfolio | 19.6% (2.7) | 19.6% (2.7) | --- | 21.0% (3.5) | 18.1% (4.0) | 12.8% (2.4) | 25.0% (4.3) |
| Non-financial risk | Concern my non-financial assets other than my home—such as my small business—might lose value | 19.2% (2.2) | 16.2% (2.4) | 23.5% (4.2) | 16.5% (3.2) | 20.5% (2.9) | 13.0% (2.5) | 22.2% (3.0) |

* Among stock market non-participants only. ** Among stock market participants only. *** Among employed respondents only. **** Among homeowners only.

**Table IV**
**Responses to Increase in Investment Horizon**

This table presents the distribution of responses to the question "Suppose that tomorrow, because you enjoy working so much, you decide to retire 10 years later than you had previously planned. Would this cause you to increase or decrease the percentage of your investable financial assets held in stocks **over the next year**?" (for stock market participants) or "Suppose that tomorrow, because you enjoy working so much, you decide to retire 10 years later than you had previously planned. Would this make you more or less likely to invest in stocks **over the next year**?" (for stock market non-participants). In the first column, the population over which these percentages are calculated is all respondents who rated the number of years left until retirement to be a very or extremely important factor in their equity allocation decision ($N = 354$). Subsequent columns report percentages over subsamples split by stock market participation, wealth (at least or below $100,000 in investible financial assets), and education (with or without a bachelor's degree). Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | All | Participant | | Wealth | | Education | |
|---|---|---|---|---|---|---|---|
| | | Yes | No | High | Low | High | Low |
| Decrease equity allocation percentage / less likely to invest in equities | 4.3% | 3.9% | 5.6% | 3.4% | 4.9% | 5.5% | 3.6% |
| | (1.2) | (1.2) | (3.4) | (1.4) | (1.9) | (2.4) | (1.3) |
| Neither increase nor decrease equity allocation percentage / neither more nor less likely to invest in equities | 33.7% | 34.2% | 30.5% | 33.6% | 33.8% | 36.0% | 32.4% |
| | (4.2) | (4.9) | (8.3) | (6.1) | (5.7) | (6.1) | (5.5) |
| Increase equity allocation percentage / more likely to invest in equities | 39.1% | 42.1% | 30.5% | 41.8% | 37.1% | 45.3% | 35.6% |
| | (4.2) | (5.1) | (7.5) | (6.2) | (5.7) | (5.8) | (5.7) |
| I don't know | 9.1% | 9.4% | 8.5% | 4.7% | 12.3% | 4.5% | 11.7% |
| | (3.7) | (4.8) | (3.8) | (2.0) | (6.1) | (2.1) | (5.6) |
| Did not respond | 13.8% | 10.3% | 24.9% | 16.4% | 11.9% | 8.7% | 16.6% |
| | (3.1) | (3.2) | (7.6) | (5.0) | (3.8) | (3.3) | (4.4) |

## Table V
## Social and Personal Factors

This table presents the percent of respondents who described the factor in the first column as very or extremely important, either for the entire sample or split by stock market participation, wealth (at least or below $100,000 in investible financial assets), and education (with or without a bachelor's degree). Some factor ratings were elicited only from stock market non-participants. Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | Survey Text | All | Participant | | Wealth | | Education | |
|---|---|---|---|---|---|---|---|---|
| | | | Yes | No | High | Low | High | Low |
| Low trust in market participants | Concern that companies, managers, brokers, or other market participants might cheat me out of my investments | 37.5% (3.0) | 34.2% (3.1) | 42.2% (5.6) | 37.1% (3.8) | 37.6% (4.1) | 26.0% (3.3) | 43.1% (4.1) |
| Don't like to think about my finances* | I don't like to think about my finances | 37.3% (5.0) | --- | 37.3% (5.0) | 34.1% (9.5) | 37.6% (5.4) | 29.6% (7.6) | 38.8% (5.8) |
| Lack of knowledge about how to invest | My lack of knowledge about how to invest | 36.2% (2.8) | 33.3% (3.4) | 39.4% (4.9) | 30.6% (3.7) | 39.2% (3.8) | 28.1% (3.2) | 40.2% (3.8) |
| Lack of trustworthy adviser | Difficulty in finding a trustworthy adviser | 31.1% (2.6) | 29.3% (3.0) | 33.7% (4.7) | 32.9% (3.7) | 30.2% (3.4) | 23.9% (3.0) | 34.7% (3.5) |
| Experience of living through returns | The feelings, attitudes, and beliefs about the stock market I've gotten from living through stock market ups and downs (whether or not I was invested in stocks at the time) | 26.9% (2.3) | 30.5% (3.0) | 22.5% (3.7) | 38.3% (3.7) | 21.2% (2.8) | 30.9% (3.3) | 25.0% (3.1) |
| Advice from professional financial adviser | Advice from a professional financial adviser I hired | 26.7% (2.4) | 34.0% (3.2) | 16.3% (3.1) | 35.3% (3.5) | 22.4% (3.1) | 27.5% (3.1) | 26.4% (3.2) |
| Personal experience investing in stock market | The feelings, attitudes, and beliefs about the stock market I've gotten from my personal experiences of investing in the stock market | 25.8% (2.4) | 29.3% (3.0) | 21.6% (3.7) | 34.3% (3.7) | 21.6% (2.9) | 28.9% (3.3) | 24.4% (3.1) |
| Religion | My religious beliefs, values, and experiences | 25.6% (2.4) | 24.0% (2.8) | 26.8% (4.4) | 20.3% (2.9) | 28.3% (3.4) | 17.8% (3.0) | 29.4% (3.4) |
| Advice from friend, family, or coworker | Advice from a friend, family member, or coworker | 15.3% (2.2) | 12.2% (2.5) | 19.6% (4.0) | 6.4% (2.1) | 19.8% (3.1) | 14.0% (3.2) | 15.9% (2.8) |
| Advice from media | Advice from a book or an article I read, or from somebody on TV, radio, or the internet | 11.9% (2.0) | 11.8% (2.6) | 12.3% (3.0) | 9.2% (2.7) | 13.3% (2.6) | 9.2% (2.7) | 13.2% (2.6) |
| Intended to invest but never got around to it* | I intended to invest in stocks but never got around to it | 3.2% (0.9) | --- | 3.2% (0.9) | 3.2% (2.0) | 3.2% (1.0) | 7.6% (3.6) | 2.4% (0.8) |

* Among stock market non-participants only.

**Table VI**
**Expected Return Beliefs**

This table presents the percent of respondents who described the factor in the first column as very or extremely important, either for the entire sample or split by stock market participation, wealth (at least or below $100,000 in investible financial assets), and education (with or without a bachelor's degree). Only stock market participants were asked about the importance of a belief that expected stock returns are higher than usual right now. Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | Survey Text | All | Participant | | Wealth | | Education | |
|---|---|---|---|---|---|---|---|---|
| | | | Yes | No | High | Low | High | Low |
| Expected stock returns lower than usual right now | A belief that the returns I can expect to earn from investing in stocks right now are lower than usual | 25.2% (2.7) | 25.4% (3.4) | 24.9% (4.4) | 22.2% (3.8) | 26.7% (3.6) | 15.1% (2.6) | 30.1% (3.7) |
| Expected stock returns higher than usual right now** | A belief that the returns I can expect to earn from investing in stocks right now are higher than usual. | 24.3% (3.5) | 24.3% (3.5) | --- | 23.8% (4.2) | 24.8% (5.6) | 11.9% (2.4) | 34.2% (5.4) |
| Stock market returns have momentum | A belief that low stock market returns tend to be followed by more low stock market returns | 18.7% (2.3) | 16.3% (2.8) | 21.9% (4.1) | 17.0% (3.7) | 19.6% (3.0) | 10.1% (2.2) | 22.8% (3.3) |
| Stock market returns mean-revert | A belief that low stock market returns tend to be followed by high stock market returns | 17.2% (2.1) | 19.8% (3.0) | 13.3% (2.9) | 21.3% (3.8) | 15.0% (2.5) | 10.9% (2.1) | 20.3% (3.0) |

** Among stock market participants only.

**Table VII**
**Neoclassical Asset Pricing Factors**

This table presents the percent of respondents who described the factor in the first column as very or extremely important, either for the entire sample or split by stock market participation, wealth (at least or below $100,000 in investible financial assets), and education (with or without a bachelor's degree). Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | Survey Text | All | Participant | | Wealth | | Education | |
|---|---|---|---|---|---|---|---|---|
| | | | Yes | No | High | Low | High | Low |
| Rare disaster risk | Concern that in an economic disaster where the amount that the U.S. economy produces in a year shrinks by more than 10%—like the Great Depression—a dollar I invested in stocks would lose more value than a dollar I put in a bank savings account | 45.5% (3.0) | 46.6% (3.3) | 44.5% (5.6) | 46.8% (3.7) | 44.7% (4.1) | 38.9% (3.5) | 48.6% (4.0) |
| Consumption commitments | My fixed expenses (like mortgage payments, rent, car payments, utility bills, etc.) that are difficult to adjust in the short run | 35.5% (2.7) | 29.7% (3.0) | 43.7% (5.2) | 25.6% (3.4) | 40.6% (3.8) | 30.3% (3.5) | 38.0% (3.7) |
| Return covariance with marginal utility of money | Concern that when I especially need the money, the stock market will tend to drop | 35.2% (3.0) | 31.2% (3.1) | 41.5% (5.6) | 31.9% (3.7) | 36.8% (4.1) | 28.0% (3.2) | 38.7% (4.1) |
| Risk of aggregate consumption over next year | Concern that when bad news arrives about how the U.S.'s material standard of living will change **over the next year**, the stock market will tend to drop | 30.3% (2.7) | 25.6% (3.1) | 37.0% (5.0) | 25.0% (3.1) | 33.1% (3.7) | 20.0% (2.5) | 35.3% (3.7) |
| Risk of long-run aggregate consumption | Concern that when bad news arrives about how the U.S.'s material standard of living will change **over the 5 year period starting 1 year in the future**, the stock market will tend to drop | 29.8% (2.6) | 25.5% (2.7) | 35.6% (5.0) | 25.6% (3.3) | 32.0% (3.5) | 20.0% (2.6) | 34.6% (3.6) |
| Return covariance with marginal utility of consumption | Concern that when I have to cut my spending, the stock market will tend to drop | 29.1% (2.9) | 25.0% (2.9) | 35.1% (5.7) | 27.0% (3.7) | 30.1% (4.0) | 18.8% (2.5) | 34.0% (4.1) |
| Risk of aggregate consumption volatility over next year | Concern that when uncertainty increases about how the U.S.'s material standard of living will change **over the next year**, the stock market will tend to drop | 28.7% (2.6) | 26.1% (3.2) | 32.6% (4.6) | 22.8% (3.0) | 31.8% (3.6) | 22.4% (3.0) | 31.8% (3.6) |
| Consumption composition risk | Concern that when the quality of my physical living situation (how nice my housing is, the safety of my neighborhood, etc.) is dropping faster than the rest of my material quality of life, the stock market will tend to drop | 28.6% (2.6) | 24.4% (3.1) | 34.6% (4.7) | 25.4% (3.6) | 30.1% (3.5) | 19.2% (2.6) | 33.2% (3.6) |
| Risk of long-run aggregate consumption volatility | Concern that when uncertainty increases about how the U.S.'s material standard of living will change **over the 10 year period starting 1 year in the future**, the stock market will tend to drop | 26.3% (2.3) | 24.7% (2.8) | 28.5% (4.1) | 25.5% (3.2) | 26.7% (3.1) | 23.9% (3.0) | 27.4% (3.1) |

\* Among stock market non-participants only. \*\* Among stock market participants only. \*\*\* Among employed respondents only. \*\*\*\* Among homeowners only.

## Table VIII
### Responses to Increase in Consumption Commitments

This table presents the distribution of responses to the question "If your fixed expenses rose as a fraction of your income, would this rise cause you to increase or decrease the percentage of your investable financial assets held in stocks?" (for stock market participants) or "If your fixed expenses rose as a fraction of your income, would this rise make you more or less likely to invest in stocks?" (for stock market non-participants). In the first column, the population over which these percentages are calculated is all respondents who rated consumption commitments to be a very or extremely important factor in their equity allocation decision ($N = 340$). Subsequent columns report percentages over subsamples split by stock market participation, wealth (at least or below \$100,000 in investible financial assets), and education (with or without a bachelor's degree). Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | All | Participant | | Wealth | | Education | |
|---|---|---|---|---|---|---|---|
| | | Yes | No | High | Low | High | Low |
| Decrease equity allocation percentage / less likely to invest in equities | 45.1% | 31.1% | 58.8% | 37.6% | 47.5% | 44.1% | 45.5% |
| | (4.6) | (5.3) | (6.5) | (8.1) | (5.5) | (6.9) | (5.8) |
| Neither increase nor decrease equity allocation percentage / neither more nor less likely to invest in equities | 30.7% | 45.2% | 16.2% | 38.4% | 28.3% | 34.2% | 29.4% |
| | (3.7) | (5.8) | (3.9) | (7.0) | (4.4) | (6.9) | (4.4) |
| Increase equity allocation percentage / more likely to invest in equities | 13.0% | 13.0% | 13.3% | 10.1% | 14.0% | 9.4% | 14.4% |
| | (3.4) | (5.2) | (4.4) | (5.1) | (4.1) | (4.7) | (4.3) |
| I don't know | 9.5% | 7.5% | 11.7% | 7.3% | 10.3% | 11.7% | 8.7% |
| | (2.2) | (2.9) | (3.5) | (3.4) | (2.7) | (4.7) | (2.5) |
| Did not respond | 1.6% | 3.3% | 0.0% | 6.6% | 0.0% | 0.6% | 2.0% |
| | (1.4) | (2.9) | (0.0) | (5.6) | (0.0) | (0.6) | (2.0) |

**Table IX**
**Nonstandard Preferences**

This table presents the percent of respondents who described the factor in the first column as very or extremely important, either for the entire sample or split by stock market participation, wealth (at least or below $100,000 in investible financial assets), and education (with or without a bachelor's degree). Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | Survey Text | All | Participant | | Wealth | | Education | |
|---|---|---|---|---|---|---|---|---|
| | | | Yes | No | High | Low | High | Low |
| Loss aversion | The possibility of even small losses on my stock investments makes me worry | 28.2% (2.6) | 22.2% (2.9) | 37.3% (5.0) | 24.0% (3.6) | 30.4% (3.5) | 17.7% (2.8) | 33.3% (3.6) |
| Internal habit | The difference between my current material standard of living and the level I am used to | 26.9% (2.6) | 24.7% (3.3) | 29.6% (4.3) | 22.4% (3.5) | 29.3% (3.5) | 18.7% (3.0) | 30.9% (3.5) |
| Ambiguity/parameter uncertainty | I don't have a good sense of the average returns and risks of investing in stocks | 26.7% (2.3) | 23.6% (2.7) | 31.6% (4.4) | 23.1% (3.3) | 28.5% (3.2) | 22.0% (2.9) | 29.0% (3.2) |
| External habit | The difference between my current material standard of living and the level everybody else around me has experienced recently | 16.3% (2.1) | 11.8% (2.4) | 22.6% (4.0) | 13.1% (3.2) | 17.9% (2.8) | 8.5% (2.0) | 20.0% (3.0) |

**Table X**
**Follow-Up Questions on Nonstandard Preferences**

This table presents the distribution of responses to questions among those who indicated that internal habit (Panel A, $N = 241$), external habit (Panel B, $N = 131$), or ambiguity/parameter uncertainty (Panel C, $N = 268$) were very or extremely important. Stock market participants were asked, "If your material standard of living fell compared to what you are used to, would this fall cause you to increase or decrease the percentage of your investable financial assets held in stocks?," "If your material standard of living fell compared to what everybody else around you has experienced recently, would this fall cause you to increase or decrease the percentage of your investable financial assets held in stocks?," and/or "If you had a better sense of the average returns and risks of investing in stocks, would that cause you to increase or decrease the percentage of your investable financial assets held in stocks?" Non-participants were asked analogous questions regarding whether these factors would "make you more or less likely to invest in stocks." In the first column, the population over which these percentages are calculated is all respondents who rated the relevant factor to be a very or extremely important factor in their equity allocation decision. Subsequent columns report percentages over subsamples split by stock market participation, wealth (at least or below $100,000 in investible financial assets), and education (with or without a bachelor's degree). Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | All | Participant | | Wealth | | Education | |
|---|---|---|---|---|---|---|---|
| | | Yes | No | High | Low | High | Low |
| **Panel A: Internal Habit – Response to fall in standard of living compared to what you are used to** | | | | | | | |
| Decrease equity allocation percentage / less likely to invest in equities | 41.9% | 39.0% | 44.3% | 45.5% | 40.5% | 60.6% | 36.4% |
| | (5.3) | (8.1) | (7.1) | (9.4) | (6.4) | (7.6) | (6.1) |
| Neither increase nor decrease equity allocation percentage / neither more nor less likely to invest in equities | 26.1% | 29.3% | 22.9% | 34.1% | 22.9% | 28.5% | 25.4% |
| | (4.2) | (6.1) | (6.3) | (8.3) | (4.9) | (6.3) | (5.2) |
| Increase equity allocation percentage / more likely to invest in equities | 7.6% | 4.4% | 11.6% | 2.8% | 9.4% | 4.3% | 8.5% |
| | (3.4) | (2.2) | (6.7) | (1.4) | (4.6) | (1.9) | (4.3) |
| I don't know | 22.3% | 23.4% | 21.1% | 10.0% | 27.1% | 5.7% | 27.2% |
| | (5.5) | (8.5) | (6.9) | (4.7) | (7.1) | (2.4) | (6.8) |
| Did not respond | 2.1% | 3.9% | 0.0% | 7.5% | 0.0% | 1.0% | 2.4% |
| | (1.9) | (3.5) | (0.0) | (6.4) | (0.0) | (1.0) | (2.4) |
| **Panel B: External Habit – Response to fall in standard of living compared to what everybody else around you has experienced recently** | | | | | | | |
| Decrease equity allocation percentage / less likely to invest in equities | 46.9% | 34.3% | 57.2% | 53.3% | 44.5% | 58.3% | 44.5% |
| | (7.1) | (11.1) | (9.5) | (13.5) | (8.1) | (11.1) | (8.1) |
| Neither increase nor decrease equity allocation percentage / neither more nor less likely to invest in equities | 23.3% | 22.9% | 21.9% | 20.1% | 24.5% | 29.9% | 21.9% |
| | (5.9) | (6.7) | (9.0) | (7.8) | (7.4) | (9.3) | (6.9) |
| Increase equity allocation percentage / more likely to invest in equities | 12.0% | 19.5% | 6.7% | 3.8% | 15.1% | 6.5% | 13.1% |
| | (5.2) | (11.1) | (2.8) | (2.9) | (6.9) | (5.0) | (6.2) |
| I don't know | 14.3% | 15.0% | 14.1% | 10.1% | 15.9% | 3.1% | 16.7% |
| | (4.9) | (6.4) | (7.2) | (7.0) | (6.1) | (2.4) | (5.8) |
| Did not respond | 3.5% | 8.3% | 0.0% | 12.8% | 0.0% | 2.1% | 3.8% |
| | (3.1) | (7.1) | (0.0) | (10.7) | (0.0) | (2.2) | (3.7) |
| **Panel C: Ambiguity / Parameter Uncertainty – Response to having a better sense of the average returns and risks of investing in stocks** | | | | | | | |
| Decrease equity allocation percentage / less likely to invest in equities | 8.1% | 3.9% | 12.6% | 0.2% | 11.4% | 1.3% | 10.6% |
| | (3.6) | (2.3) | (6.7) | (0.3) | (4.9) | (1.1) | (4.8) |
| Neither increase nor decrease equity allocation percentage / neither more nor less likely to invest in equities | 17.3% | 17.1% | 17.6% | 19.5% | 16.5% | 19.6% | 16.5% |
| | (3.2) | (4.0) | (5.0) | (5.7) | (3.8) | (4.9) | (3.9) |
| Increase equity allocation percentage / more likely to invest in equities | 57.7% | 60.0% | 55.5% | 57.6% | 57.9% | 61.4% | 56.3% |
| | (4.7) | (6.1) | (7.1) | (8.0) | (5.8) | (6.3) | (5.9) |
| I don't know | 14.6% | 14.8% | 13.9% | 15.5% | 13.9% | 16.9% | 13.7% |
| | (2.7) | (3.4) | (4.4) | (4.4) | (3.4) | (4.0) | (3.5) |
| Did not respond | 2.3% | 4.1% | 0.3% | 7.3% | 0.2% | 0.8% | 2.8% |
| | (1.9) | (3.6) | (0.3) | (6.2) | (0.2) | (0.8) | (2.6) |

Table XI
**Miscellaneous Factors**

This table presents the percent of respondents who described the factor in the first column as very or extremely important, either for the entire sample or split by stock market participation, wealth (at least or below $100,000 in investible financial assets), and education (with or without a bachelor's degree). Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | Survey Text | All | Participant | | Wealth | | Education | |
|---|---|---|---|---|---|---|---|---|
| | | | Yes | No | High | Low | High | Low |
| Need cash on hand for routine expenses | The amount of cash I need to have on hand to pay routine expenses | 47.2% (3.0) | 38.6% (3.4) | 59.9% (5.0) | 40.2% (3.9) | 50.7% (4.0) | 35.4% (3.7) | 52.9% (3.9) |
| Stocks take too long to convert to cash in emergency | Concern that stock investments will take too long to convert into spendable cash in an emergency | 29.1% (3.1) | 24.2% (3.0) | 36.6% (5.8) | 22.5% (3.7) | 32.4% (4.2) | 18.0% (3.0) | 34.5% (4.2) |
| Default allocation in retirement savings plan | The default investment allocation in my (and/or my spouse/partner's, if applicable) work-based retirement savings plan (for example, 401(k), 403(b), Thrift Savings Plan) | 25.7% (3.0) | 27.3% (3.0) | 24.1% (6.0) | 24.5% (3.3) | 26.4% (4.2) | 20.4% (3.0) | 28.3% (4.1) |
| Stock market returns before I was born | What I know about the stock market's returns during the decades before I was born | 15.9% (2.2) | 14.4% (2.6) | 18.4% (3.9) | 15.4% (3.1) | 16.2% (2.9) | 16.1% (3.0) | 15.8% (2.9) |
| Rule of thumb | A rule of thumb (for example, "The percent you invest in stocks should be 100 minus your age" or "Invest one-third in stocks, one-third in bonds, and one-third in real estate") | 12.7% (1.8) | 11.1% (2.3) | 14.2% (3.0) | 11.6% (2.8) | 13.3% (2.4) | 7.5% (1.9) | 15.2% (2.6) |

**Table XII**
**Fixed Costs of Stock Market Participation**

This table presents, among respondents who said that "the amount of money I have available to invest in stocks is too small" is a very or extremely important factor in their not holding stocks, the percent who described the factor in the first column as very or extremely important in causing the amount of money they have to be too small. The percentages are calculated over either the entire subsample ($N = 211$) or over the subsample split by stock market participation, wealth (at least or below \$100,000 in investible financial assets), and education (with or without a bachelor's degree). The question about home crowd-out is asked only of homeowners in the subsample ($N = 96$). Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | Survey Text | All | Wealth | | Education | |
|---|---|---|---|---|---|---|
| | | | High | Low | High | Low |
| Costs of staying up-to-date | The **ongoing** time, money, and/or effort it would take to stay up-to-date on the stock market | 45.3% (7.2) | 78.5% (11.4) | 44.2% (7.3) | 47.6% (10.1) | 44.6% (8.9) |
| Costs of learning about stocks | The amount of time, money, and/or effort it would take to learn about stocks | 41.2% (6.8) | 76.9% (12.1) | 40.1% (6.8) | 40.8% (9.4) | 41.4% (8.4) |
| Costs of hiring an adviser | The amount of time, money, and/or effort it would take to hire an investment adviser | 39.3% (6.7) | 65.7% (15.9) | 38.5% (6.8) | 31.8% (8.5) | 41.7% (8.5) |
| Costs of maintaining an account | The **ongoing** time, money, and/or effort it would take to **maintain** an investment account **after** setting it up | 37.4% (6.4) | 56.2% (18.4) | 36.8% (6.6) | 37.8% (9.3) | 37.3% (7.9) |
| Costs of maintaining an adviser | The **ongoing** time, money, and/or effort it would take to **maintain** a relationship with an investment adviser **after** hiring him or her | 37.4% (6.4) | 59.8% (17.7) | 36.7% (6.5) | 35.5% (9.0) | 38.0% (7.9) |
| Costs of setting up an account | The amount of time, money, and/or effort it would take to set up an investment account | 30.8% (5.8) | 58.6% (17.8) | 29.9% (5.8) | 24.0% (7.8) | 32.9% (7.4) |
| Tax complexity | Stock investments would make my tax returns harder to prepare | 27.6% (5.4) | 14.9% (9.5) | 28.0% (5.6) | 25.8% (8.6) | 28.2% (6.6) |
| Home crowd-out**** | You said you own your home. How important is that in causing you to not have enough money to make it worthwhile to invest in stocks? | 26.6% (6.9) | 62.9% (18.2) | 23.8% (7.0) | 26.0% (9.5) | 26.9% (9.2) |

**** Among homeowners only.

## Table XIII
## Principal Components Analysis

This table shows loadings on the first six principal components computed over the equity share factors asked of every respondent in Table 2. Factors with a loading above 0.32 are bolded.

| Principal component 1: Neoclassical asset pricing factors | | Principal component 2: Return predictability and defaults | | Principal component 3: Consumption needs, habit, and human capital | | Principal component 4: Discomfort with market | | Principal component 5: Advice | | Principal component 6: Personal experience | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Risk of aggregate consumption over next year** | **0.41** | **Stock market returns mean-revert** | **0.48** | **Consumption commitments** | **0.45** | **Lack of knowledge about how to invest** | **0.50** | **Advice from media** | **0.52** | **Experience of living through stock market returns** | **0.66** |
| **Risk of aggregate consumption volatility over next year** | **0.39** | **Expected stock returns lower than usual right now** | **0.40** | **Time until significant non-retirement expense** | **0.43** | **Ambiguity / Parameter uncertainty** | **0.49** | **Advice from a friend, family member, or coworker** | **0.51** | **Personal experience investing in stock market** | **0.64** |
| **Risk of long-run aggregate consumption** | **0.39** | **Stock market returns have momentum** | **0.37** | **Internal habit** | **0.37** | **Lack of trustworthy adviser** | **0.42** | External habit | 0.29 | Stock market returns before I was born | 0.21 |
| **Risk of long-run aggregate consumption volatility** | **0.38** | **Default allocation in retirement savings plan** | **0.34** | **Human capital fraction of total wealth** | **0.34** | **Loss aversion** | **0.38** | Rule of thumb | 0.28 | | |
| **Return covariance with marginal utility of consumption** | **0.35** | Rule of thumb | 0.26 | External habit | 0.31 | Lack of trust in market participants | 0.29 | Advice from a professional financial adviser | 0.25 | | |
| **Return covariance with marginal utility of money** | **0.33** | Religious beliefs, values, and experiences | 0.25 | Risk of illness/injury | 0.31 | | | Stock market returns before I was born | 0.25 | | |
| Consumption composition risk | 0.25 | Stocks take too long to convert to cash in emergency | 0.24 | Need cash on hand for routine expenses | 0.27 | | | | | | |
| Rare disaster risk | 0.20 | | | | | | | | | | |

**Table XIV**
**Regression of Equity Share on Principal Component Scores**

This table shows coefficients from regressions of the fraction of each respondent's investible financial assets held in equities on the respondent's first six principal component scores normalized by each of their standard deviations. The regressions in the second and fourth columns additionally control for respondent demographics: age, age squared, and dummies for gender, living situation, education, race, Hispanic or Latino identification, and household income category. The first two columns are estimated using OLS, and the second two columns are estimated using tobit regressions censored at 0% and 100%. Observations are not weighted by their sampling weights (i.e., each is equally weighted). Standard errors robust to heteroskedasticity are in parentheses below each point estimate. The regressions exclude seven respondents who did not answer the equity allocation percentage question and four respondents who reported an allocation percentage greater than 100% (these four responses were 5,000% or above). Regressions with demographic controls exclude one respondent who did not did not provide information on race and one respondent who answered the question on home ownership with "unsure." * Significant at the 5% level. ** Significant at the 1% level.

|  | OLS | | Tobit | |
|---|---|---|---|---|
| Principal component 1 | -3.65* | -3.16* | -5.26* | -4.53* |
| (Neoclassical asset pricing factors) | (1.43) | (1.34) | (2.41) | (2.15) |
| Principal component 2 | 4.78** | 4.73** | 8.67** | 7.90** |
| (Return predictability and defaults) | (1.50) | (1.47) | (2.60) | (2.44) |
| Principal component 3 | -2.29 | 0.042 | -4.70 | 0.13 |
| (Consumption needs, habit, and human capital) | (1.48) | (1.40) | (2.49) | (2.31) |
| Principal component 4 | -9.21** | -6.45** | -15.58** | -10.94** |
| (Discomfort with market) | (1.38) | (1.34) | (2.46) | (2.30) |
| Principal component 5 | -0.77 | 1.41 | -1.74 | 2.38 |
| (Advice) | (1.23) | (1.16) | (2.18) | (2.00) |
| Principal component 6 | 6.06** | 1.77 | 9.22** | 1.92 |
| (Personal experience) | (1.15) | (1.16) | (1.73) | (1.63) |
| Constant | 36.54** | 11.70 | 25.55** | -16.14 |
|  | (1.08) | (14.69) | (1.85) | (24.61) |
| Demographic controls | No | Yes | No | Yes |
| Observations | 1,002 | 1,000 | 1,002 | 1,000 |

**Table XV**
**Actively Managed Mutual Funds**

Panel A presents, among respondents who said that they had ever purchased shares in an actively managed stock mutual fund ($N = 459$), the percent who described the factor in the first column as very or extremely important in their decision to invest in an actively managed stock fund instead of a passive stock fund. Panel B presents, among all survey respondents ($N = 1,013$), the percent who agree or strongly agree with the statement in the first column. The percentages are calculated over either the entire sample for the panel or over the panel's sample split by whether the respondent reported knowing what a mutual fund is, wealth (at least or below \$100,000 in investible financial assets), and education (with or without a bachelor's degree). Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | Survey Text | All | Knew what mutual fund is | | Wealth | | Education | |
|---|---|---|---|---|---|---|---|---|
| | | | Yes | No | High | Low | High | Low |
| Panel A: How important were the following factors in your decision(s) to invest in an actively managed stock fund instead of a passively managed stock fund? Percent responding factor is very or extremely important | | | | | | | | |
| Higher returns | A belief that the actively managed stock mutual fund would give me **higher returns** on average than a passively managed stock mutual fund | 51.1% (4.0) | 48.7% (4.2) | 64.7% (10.3) | 47.8% (4.7) | 55.7% (6.8) | 44.9% (5.0) | 58.4% (6.0) |
| Adviser recommendation | The recommendation of an investment adviser I hired | 47.9% (4.0) | 45.6% (4.2) | 60.7% (11.9) | 45.5% (4.6) | 51.2% (7.0) | 50.3% (5.0) | 45.0% (6.2) |
| Hedging | A belief that even though the actively managed stock mutual fund would have **lower returns** on average than a passively managed stock mutual fund, the actively managed fund would have higher returns than the passively managed fund when the economy does poorly (for example, during recessions or stock market crashes) | 27.3% (3.5) | 24.9% (3.6) | 40.9% (11.3) | 23.4% (3.6) | 32.8% (6.6) | 25.8% (4.8) | 29.2% (5.3) |
| Passive not available | A suitable passively managed stock mutual fund wasn't available in my employer-sponsored retirement savings plan | 18.2% (3.5) | 16.4% (3.7) | 28.1% (10.5) | 15.7% (4.0) | 21.6% (6.3) | 15.1% (4.0) | 21.8% (6.0) |
| Panel B: How much do you agree with the following statement? Percent responding agree or strongly agree | | | | | | | | |
| Managerial skill | When an actively managed stock mutual fund has had significantly higher past returns than the overall stock market, this is strong evidence that its manager has good stock-picking skills | 46.0% (2.9) | 53.9% (3.3) | 37.0% (4.7) | 56.0% (3.7) | 40.9% (3.8) | 49.1% (3.8) | 44.6% (3.8) |
| Decreasing returns to scale | When an actively managed stock mutual fund gets more money to manage, it becomes harder for it to generate higher returns than the overall stock market | 18.2% (2.2) | 20.8% (2.7) | 15.2% (3.8) | 25.2% (3.5) | 14.6% (2.8) | 17.8% (2.6) | 18.4% (3.1) |

**Table XVI**
**Cross-Section of Stock Returns**
This table presents the distribution of responses to questions about the expected returns and risks of value stocks versus growth stocks, and high-momentum stocks versus low-momentum stocks. The high wealth subsample is those with at least $100,000 of investible assets. Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | Panel A: Expected returns | | | |
| --- | --- | --- | --- | --- |
| | Compared to a growth stock, I expect a value stock to normally have… over the next year, on average | | Compared to a stock whose price fell a lot over the past year, I expect a stock whose price rose a lot over the past year to normally have… over the next year on average | |
| | All | High wealth | All | High wealth |
| Higher returns | 24.7% | 27.7% | 24.3% | 26.0% |
| | (2.3) | (3.2) | (2.9) | (3.3) |
| About the same | 20.3% | 29.2% | 32.1% | 32.1% |
| | (2.0) | (3.4) | (2.7) | (3.5) |
| Lower returns | 28.1% | 22.4% | 14.2% | 20.3% |
| | (3.2) | (3.2) | (2.0) | (3.4) |
| No opinion | 25.5% | 17.3% | 28.0% | 18.2% |
| | (2.4) | (2.8) | (2.5) | (2.3) |
| No response | 1.4% | 3.4% | 1.4% | 3.4% |
| | (0.6) | (1.7) | (0.6) | (1.7) |
| | Panel B: Risk | | | |
| | Compared to a growth stock, I expect a value stock to normally be… over the next year, on average | | Compared to a stock whose price fell a lot over the past year, I expect a stock whose price rose a lot over the past year to normally be… over the next year on average | |
| | All | High wealth | All | High wealth |
| Riskier | 14.0% | 16.0% | 24.7% | 23.9% |
| | (1.7) | (2.8) | (3.1) | (3.6) |
| Equally risky | 15.8% | 13.4% | 33.6% | 43.9% |
| | (1.9) | (2.3) | (2.5) | (3.7) |
| Less risky | 43.9% | 54.0% | 14.3% | 13.6% |
| | (3.0) | (3.7) | (2.0) | (2.1) |
| No opinion | 25.0% | 13.1% | 26.1% | 15.2% |
| | (2.4) | (2.0) | (2.5) | (2.1) |
| No response | 1.4% | 3.4% | 1.4% | 3.4% |
| | (0.6) | (1.7) | (0.6) | (1.7) |

**Table XVII**
**Correlates of Beliefs About the Cross-Section of Stock Returns**

This table shows ordinary least squares regression coefficients where the dependent variables are dummies for the respondent saying that value stocks have higher expected returns than growth stocks, value stocks have higher risk than growth stocks, value stocks have higher risk-adjusted returns than growth stocks, and analogous variables for high-momentum stocks. The explanatory variables are age in years divided by 100 and dummies for having at least a bachelor's degree, having at least $100,000 in investible financial assets, having income of at least $100,000, and being female. Observations are not weighted by their sampling weights (i.e., each is equally weighted). Two respondents for whom wealth in unavailable and four respondents for whom income is unavailable are coded as non-high wealth and non-high income, respectively. The results are virtually identical if we omit these six respondents from the regression. Standard errors robust to heteroskedasticity are in parentheses below the point estimates. * Significant at the 5% level. ** Significant at the 1% level.

| | Value stocks | | | High-momentum stocks | | |
|---|---|---|---|---|---|---|
| | Higher expected returns | Higher risk | Higher risk-adjusted returns | Higher expected returns | Higher risk | Higher risk-adjusted returns |
| Age/100 | -0.001 | 0.077 | 0.060 | 0.122 | -0.251* | 0.294** |
| | (0.105) | (0.088) | (0.109) | (0.104) | (0.098) | (0.101) |
| High education | 0.008 | -0.009 | 0.026 | 0.053 | 0.052 | 0.021 |
| | (0.029) | (0.025) | (0.032) | (0.030) | (0.027) | (0.029) |
| High wealth | 0.058 | 0.003 | 0.082* | -0.047 | 0.025 | -0.053 |
| | (0.034) | (0.028) | (0.036) | (0.034) | (0.030) | (0.033) |
| High income | 0.026 | -0.012 | 0.029 | 0.067 | 0.033 | 0.012 |
| | (0.039) | (0.030) | (0.041) | (0.037) | (0.036) | (0.035) |
| Female | -0.054 | -0.007 | -0.050 | 0.021 | -0.090** | 0.025 |
| | (0.029) | (0.023) | (0.030) | (0.028) | (0.026) | (0.027) |
| Constant | 0.261** | 0.121* | 0.254** | 0.161** | 0.351** | 0.062 |
| | (0.064) | (0.051) | (0.068) | (0.061) | (0.060) | (0.058) |
| Observations | 1,013 | 1,013 | 1,013 | 1,013 | 1,013 | 1,013 |

**Appendix Table AI**
**Why Did You Not Get Around to Investing in Stocks?**

This table presents, among respondents who said that "I intended to invest in stocks but never got around to it" is a very or extremely important factor in their not holding stocks, the percent who described the factor in the first column as very or extremely important in causing them to not get around to investing in stocks. The percentages are calculated over either the entire subsample ($N = 79$) or over the subsample split by stock market participation, wealth (at least or below $100,000 in investible financial assets), and education (with or without a bachelor's degree). Standard errors are in parentheses below the point estimates. All statistics are calculated using sampling weights.

| | Survey text | All | Wealth | | Education | |
|---|---|---|---|---|---|---|
| | | | High | Low | High | Low |
| Less money available now | I have less money available now than when I originally planned on investing in stocks | 42.0% (13.4) | 9.8% (10.7) | 42.9% (14.0) | 61.3% (13.4) | 36.9% (14.8) |
| Too costly | I discovered that it takes more time, money, and/or effort to invest in stocks than I expected | 36.5% (12.0) | 29.2% (25.0) | 36.7% (12.4) | 63.6% (12.8) | 29.4% (12.4) |
| Procrastinated | I procrastinated for no good reason | 18.3% (7.0) | 53.2% (24.4) | 17.3% (7.0) | 12.1% (6.8) | 19.9% (9.1) |
| Too busy | I was too busy | 17.9% (7.0) | 26.0% (19.1) | 17.7% (7.1) | 38.7% (14.2) | 12.4% (6.2) |
| Not important enough | I decided it wasn't important enough to think about it | 12.6% (5.8) | 0.0% (0.0) | 12.9% (6.1) | 29.1% (15.2) | 8.2% (4.7) |