

PROUD TO NOT OWN STOCKS: HOW IDENTITY SHAPES FINANCIAL DECISIONS

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Abstract

This paper introduces a key factor influencing households' decision to invest in the stock market: how people view stockholders. Using surveys we conducted with nearly 8,500 individuals from eleven countries, we document that a large majority views stockholders negatively on identity-relevant characteristics. Linking survey and administrative data, we find that these negative perceptions strongly predict households' stock market participation. We then show that negative perceptions causally influence decision-making and provide evidence supporting identity concerns as the underlying mechanism. Our findings provide new perspectives on the malleability of financial decision-making and a novel explanation for low stock market participation rates.

Keywords: stock market participation, financial decision-making, identity, perceptions, stereotypes

JEL Classification: G41, G51, D14, D83

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1 Introduction

The decision to invest in the stock market is a central element of households' financial decision-making. Stock investments offer substantially higher expected returns than other asset classes at the expense of increased short-run volatility (Jordà et al., 2019). They are thus widely recommended by financial experts as a vital aspect of households' long-term saving strategies (e.g., for retirement). Nevertheless, in almost all countries, the majority of households do not invest in stocks (Gomes et al., 2021). Widespread avoidance persists even among wealthy households and remains largely unexplained by classical preference- or constraint-based explanations.¹ The resulting underdiversification of households' portfolios has major implications for societal challenges such as wealth inequality, financial stability, and the design of pension systems (e.g., Fagereng et al., 2017; Kuhn et al., 2020).

Despite the potential advantages of stock investments for households and their importance to society, the media frequently characterize investors in ways that are commonly considered to be objectionable or repulsive. For instance, movies such as the 1987 classic "Wall Street" or the more recent "Wolf of Wall Street" provide vivid examples of stock investors and brokers as selfish individuals who are willing to take extreme risks at the expense of others. Likewise, popular books about stock investing describe investors as being strongly motivated by greed (Shefrin, 2002; Nofsinger, 2017).

This paper investigates how people's views about stockholders influence financial decision-making. To conceptualize the relationship between views and choice behavior, we develop a theoretical framework in which people care about the characteristics of individuals making similar decisions to themselves. This form of identity concern leads people to experience disutility if they associate themselves through their decisions with a group they perceive to have negative character traits.² Using large-scale surveys conducted in eleven countries, we document widespread negative perceptions of stockholders on identity-relevant characteristics. These perceptions strongly predict households' stock market

¹As an example, among all households in the Netherlands with a net balance of at least 60,000 € in financial assets (top 20% quantile), 55% do not have stock holdings. Instead, their assets are concentrated in banking and saving accounts. See Guiso and Sodini (2013) for similar evidence in other countries. Explaining such behavior through risk attitudes requires implausibly high degrees of risk aversion (Heaton and Lucas, 2000).

²In our framework, identity concerns induced by negative views operate even in private, which is important because investment decisions are mostly unobserved by others. While presumably amplified when choices are observable, we show empirically the relevance of identity concerns for financial decisions when choices are made anonymously.

participation as identified by administrative data. We then use two preregistered experiments to show that perceptions causally drive financial decisions and provide evidence that identity concerns are a likely mechanism.

In the first step of our empirical analysis, we measure individuals' perceptions of stockholder and non-stockholder characteristics and use them to predict individuals' stock market participation. Guided by our framework, we focus on identity-relevant characteristics, i.e., character traits that are important to people. To select relevant traits, we provide participants ($N = 194$) with a set of traits, asking them to rate how important each trait is to them and how strongly they associate them with stockholders. We find that the traits greed, being a gambler, and selfishness are rated highest along these two dimensions. We then measure individuals' perceptions of stockholders and non-stockholders with respect to these three traits using surveys fielded to 3,272 Dutch respondents of the LISS panel and 5,130 respondents living in Australia, Germany, Italy, Japan, Mexico, South Korea, Spain, Sweden, the United Kingdom, and the United States ($N \approx 500$ per country). The LISS panel builds upon a probability sample of the Dutch population, employing special efforts to ensure that the sample is population representative. The samples from the other countries are representative with respect to age and gender. In the surveys, respondents consider stockholders and non-stockholders of their respective countries and separately rate each group on three character traits—greed, being a gambler, and selfishness—which we validate as traits people predominantly view negatively.

We document that large fractions of respondents view stockholders negatively on identity-relevant characteristics. In all eleven countries, stockholders are rated significantly more greedy, gambler-like, and selfish than non-stockholders ($p < 0.001$ in each country). Averaging over the three traits, between 49% and 81% of respondents rate stockholders strictly more negative than non-stockholders. In a series of robustness checks, we replicate widespread negative perceptions using alternative elicitation methods and framing variations. For instance, respondents also rate stockholders significantly more negatively when considering positively framed characteristics.

We then demonstrate that negative perceptions significantly predict stock market participation revealed through administrative records. The LISS panel enables us to link subjects' perceptions of

stockholders to their asset allocations based on tax records provided by Statistics Netherlands. To control for the influence of other behavioral variables determining investment decisions, we link our survey with previous questionnaires to obtain measures of subjects' risk aversion, beliefs regarding stock returns, financial numeracy, general trust, political orientation, ambiguity aversion, and likelihood insensitivity.

Our results show that negative perceptions of stockholders strongly predict stock market participation. Controlling for alternative determinants and demographic variables, a one-standard-deviation increase in negative perceptions is associated with a 4.8 pp. decrease in the likelihood of owning stocks. This is a considerable effect size because only 23% of our sample owns stocks. Moreover, the coefficient is larger than the marginal effects of almost all other determinants. We further show the generalizability of our results in the surveys we fielded to the ten other countries. Using self-reported stock market participation as the dependent variable, we find a significant negative relationship in nine out of ten countries. In a pooled regression with country fixed-effects, a one-standard-deviation increase in negative perceptions is associated with a 6.9 pp. decrease in stock market participation.

Since the previous results are correlational, in the second step of our analysis, we investigate whether perceptions causally influence investment behavior. Specifically, our framework predicts (i) that people exhibit *stock market aversion*, i.e., they dislike stock investments relative to non-stock investments even when all outcome-related features are held constant, and (ii) that views about stockholders drive this stock aversion behavior. Accordingly, we use a two-part approach to test our framework. First, we construct a decision environment and treatment variation that enable clean identification of stock aversion behavior. We then investigate the effect of exogenous changes in people's views of stockholders. An ideal test of stock market aversion compares choices between two otherwise identical investments that differ only in their association with the stock market. In reality, however, stock investments differ from other investments in many relevant aspects, such as expected returns, costs, and uncertainty. We thus conduct an experiment (US, $N = 515$) to test for stock market aversion.

In our experiment, we employ a simple incentivized investment choice in which subjects repeat-

edly choose between a safe and a risky option. Choosing the safe option yields an amount with certainty, while choosing the risky option yields a high or low payoff with equal probability. In two treatments, we vary how the options are described to subjects. In the *Stock Framing* treatment, the risky option is described as an investment whose outcomes are associated with the stock market, i.e., based on past stock performances. In the *Draw Framing* treatment, the risky option is instead described as an investment whose outcomes depend on a random draw. The safe option is described as abstaining from the respective investment. Since the descriptions of options are the only difference between the treatments, the underlying probabilities and payoffs are identical across treatments. By design, both descriptions are of similar length and complexity. Consequently, we identify the effect of varying the association of an investment on behavior while keeping outcome-related features constant. We further validate that subjects' decisions in the *Stock Framing* treatment are informative of real-world behavior by showing that decisions significantly predict both whether subjects participate in the stock market and, among non-stockholders, whether they intend to participate in the future.

We find a 27% decrease in subjects' likelihood of choosing the risky option when the option is described as a stock investment instead of an investment in the outcome of a random draw ($p < 0.001$). Notably, the fraction of subjects who refuse to choose the risky option in any decision almost doubles, from 19% in the *Draw Framing* treatment to 36% in the *Stock Framing* treatment. Using additional within-subject variation in the descriptions reveals that almost 40% of subjects are stock averse. These participants are willing to invest under the *Draw Framing* but exhibit a strictly lower willingness to invest under the *Stock Framing*. Accordingly, we find support for the prediction of our framework that the mere association of an option with the stock market leads to aversion.

We then provide causal evidence that subjects' negative perceptions of stockholders influence financial decisions. We conduct an experiment (US, $N = 548$) in which we exogenously shift subjects' perceptions and measure the shift's impact on their decision-making. For each subject, we randomly draw ten stockholders and ten non-stockholders out of a separate sample of 272 stockholders and non-stockholders that allocate money between themselves and a charity. We then inform subjects about the difference in donation behavior between the stockholders and non-stockholders of their draw,

leading to between-subject variation in the direction and magnitude of the information generated. For example, some subjects receive the information that in their draw, stockholders donated 10% more to the charity than non-stockholders, while others are informed that in their draw non-stockholders donated 30% more. Afterwards, we elicit subjects' perceptions and ask them to choose whether to bet on risky options described as a stock investment using the choice paradigm employed in the previous experiment.

We find that providing subjects with information on the difference in donation behavior between stockholders and non-stockholders significantly influences their perceptions, and crucially their investment decisions. The stronger the signal that stockholders donated more, the less negatively the subjects view stockholders compared to non-stockholders ($p < 0.001$). This shift in perception translates into behavior: a 10 pp. increase in the donation difference favoring stockholders increases the likelihood of investments in the stock option by 0.9 pp. ($p = 0.028$). This effect is sizable since a one-standard-deviation increase in the signal mitigates the effect of varying descriptions found in the previous experiment by 25%. Employing an instrumental variable approach, we estimate that a one-standard-deviation decrease in subjects' negative perception of stockholders causally increases investments in the stock option by 14-16 pp. (from an average of 45%). We conclude that negative perceptions are a key driver of the stock market aversion documented in our experiments.

In a follow-up survey conducted several days later, we still find significant changes in subjects' perceptions of stockholders. Furthermore, subjects who received the information that stockholders donated more report a stronger intention to invest than those who received the information that non-stockholders donated more ($p < 0.01$). We purposefully framed the follow-up differently to obfuscate the relation to the main experiment. Since we observe that subjects do not perceive a connection between the main experiment and follow-up, experimenter demand effects cannot explain these results (Haaland et al., 2023).

In the third and final empirical step of this study, we examine the mechanism through which perceptions influence behavior as well as the origin of negative perceptions. In our framework, people have identity concerns, which lead them to avoid stock investments if they view stockholders nega-

tively. To reveal identity concerns in the stock market context, we adapt a commonly used identity scale, capturing whether subjects themselves consider the context identity-relevant, and an ingroup versus outgroup allocation game, capturing a behavioral consequence of identity concerns. Evidence from both measures suggest identity concerns are widespread in our sample. Importantly, negative views of stockholders significantly predict the extent of identity concerns, and these, in turn, predict incentivized investment decisions and intentions to participate in the stock market.

With respect to the origin of negative perceptions, we find evidence consistent with the stereotypes model of Bordalo et al. (2016). In the model, people overweight a group's representative types, thereby exaggerating actual group differences. We show that stockholders self-assess as more greedy, gambler-like, and selfish and behave more selfishly than non-stockholders, but these differences are small and concentrated in the tail: stockholders are relatively more likely among very greedy, selfish, and gambler-like individuals. The model then predicts that perceptions are stereotypical – exaggerated representations of reality – and we indeed find that subjects significantly overestimate the actual differences.

This paper makes several contributions to the literature. First, our paper contributes to research on the determinants of stock market participation. Previous literature has primarily focused on explaining people's non-participation through preferences and beliefs related to investment outcomes as well as constraints (Gomes et al., 2021).³ However, stock averse behavior is prevalent in our experiments although outcome- and constraint-based factors are held constant. Hence, we demonstrate that previous explanations neglect an important factor driving non-participation and provide evidence that people's negative perceptions of stockholders cause this type of behavior.

A number of studies have examined factors predicting investment behavior unrelated to the potential outcomes and constraints of investments. The identity-based mechanism proposed in our study provides new ways for interpreting these empirical patterns. Kaustia and Torstila (2011) argue that

³Preference-based explanations investigate how different weightings of outcomes induced by risk-, ambiguity- (e.g., Dimmock et al., 2016a), loss averse (Barberis et al., 2006) or likelihood insensitive preferences (Dimmock et al., 2016b) influence participation. Belief-based explanations have focused on factors such as return beliefs (e.g., Giglio et al., 2021) or optimism (Puri and Robinson, 2007). Constraint-based explanations postulate that factors such as participation costs (Vissing-Jorgensen, 2004), limited financial literacy (e.g., van Rooij et al., 2011) and cognitive function (Grinblatt et al., 2011) prevent people from participating.

personal values matter for investment decisions by showing that political orientation is correlated with stock market participation in Finland.⁴ Our framework and evidence document a precise mechanism of how values shape investment choices. Another strand of literature finds that cultural background, social interactions and social involvement matter for financial decision-making (Haliassos et al., 2017; Kuchler and Stroebel, 2021). Our framework suggests a specific channel through which culture and social influences matter: they shape people's perceptions of stockholders, which in turn influence their behavior. Furthermore, a nascent literature investigates how anti-finance sentiments influence investment behavior (Grosfeld et al., 2013; D'Acunto et al., 2019; D'Acunto, 2020; Lenz and Mayer, 2023). While these studies consider individuals' trust in financial markets as a potential mechanism predicting stock market participation (Guiso et al., 2008), anti-finance sentiments fostering negative images of stockholders provide an alternative rationale for the documented patterns.⁵

Second, we contribute to the emerging literature on the relationship between identity and economic behavior (Akerlof and Kranton, 2000; Shayo, 2020; Bénabou and Henkel, 2025). Identity has been found relevant for workers' productivity in firms (Hjort, 2014; Ghosh, 2024), consumption choices (Atkin et al., 2021), and labor market supply (Oh, 2023). Bauer and Smeets (2015) find that investors' identification with socially responsible investments is associated with a larger wealth share invested in these assets. We show that identity concerns causally influence investment behavior and contribute conceptually by linking identity concerns to people's perceptions of groups.⁶

Third, we contribute to the literature studying people's perceptions about others (Bursztyn and Yang, 2022), such as perceptions about income (Cullen and Perez-Truglia, 2022), political opinions (Ahler, 2014) and gender (Bordalo et al., 2019). We add the investigation of people's perceptions of character traits of others and show that identity concerns lead those perceptions to causally influence

⁴Relatedly, Keller and Siegrist (2006) find that a substantial fraction of people views the stock market as unethical, which in turn predicts their willingness to invest in stocks.

⁵We designed our experiment such that differential trust among subjects cannot drive our treatment effects. Furthermore, we control for trust in our analysis involving actual stock market participation.

⁶People's desire to uphold a positive identity or self-image by using behavior as a signaling device has been shown to influence choices (Grossman and van der Weele, 2017; Bursztyn et al., 2020; Falk, 2021; Schneider, 2022; Mechtenberg et al., 2024). So far, such identity concerns have not been linked to people's views about others. Related is the idea that people care about the opinion of others. Such social image concerns (e.g., Ariely et al., 2009), status concerns (Bursztyn et al., 2018), and social pressure (Bursztyn and Jensen, 2017) similarly influence behavior.

behavior. By showing that people's perceptions of stockholders are stereotypical, we also relate to the economic literature on stereotypes (Bordalo et al., 2016). This literature typically considers group categorizations wherein changing group membership is impossible (e.g., ethnicity) or takes considerable effort (e.g., nationality). In contrast, we show that in a setting where groups are based on actions, and thus easily changeable, strong stereotypical beliefs are prevalent and causally influence decisions. A recent study combining identity and stereotypes in a theoretical framework of endogenous group choice is Bonomi et al. (2021). We empirically document the connection between identity, stereotypes, and financial decision-making.

2 Conceptual framework

In this section, we formalize the idea that people's perceptions of other people's character traits matter for their decision-making, building on the concept of identity concerns. We use the framework to develop our hypotheses and guide our analyses in the next sections.

In our framework, we consider an individual i who has to take an action a out of a set of available actions A . Each action a is characterized by a state-contingent prospect $z_a = (E_1 : x_1, E_2 : x_2 \dots)$ yielding outcome x_j if event E_j occurs. Individual i 's utility from the prospect is denoted by $u_i(z_a)$, a function that flexibly captures attitudes, preferences, and beliefs related to the action's outcomes. In particular, $u_i(z_a)$ may capture different types of weighting functions over the events (e.g., subjective probabilities as special case for subjective expected utility maximizers), and various uncertainty preferences over outcomes and endowments (e.g., risk- or ambiguity aversion).

Individuals in our framework not only care about the outcomes of their actions, but also about their identity – their sense of self (Akerlof and Kranton, 2000). Each individual is characterized by a set of attributes or traits (q_1, q_2, \dots, q_H) . An individual's identity is based on a subset of these characteristics, which we refer to as identity-relevant characteristics.⁷ For these traits, individuals care about whether they and others possess them. For instance, liking the color blue might not be particularly important to an individual, but they may care a lot about being able to see themselves

⁷How individuals view and categorize themselves is thus based on character traits. A large literature in psychology studies the various ways in which individuals categorize themselves and how it forms their identity (see e.g., Burke and Stets, 2009; Stets and Serpe, 2013, for overviews).

as a caring, selfless person. Indeed, traits related to morality have been found to be central to people (Wojciszke et al., 1998; Goodwin et al., 2014; Strohminger and Nichols, 2014). We assume each trait q_h is evaluated on a numerical scale, on which higher values indicate a more positive evaluation and individuals care about the (weighted) average \bar{q} of the set of identity-relevant traits.

Importantly, individuals have identity concerns: they seek to uphold a positive identity. The crucial element in our framework is that these concerns are influenced by how individuals view others: individuals care about the characteristics of others making similar decisions as themselves. For each action, there is a group of individuals $g \in G$ that is associated with the action. Let $g : A \rightarrow G$ denote a mapping indicating which group is associated with each action. We assume that people care about the average value of the identity-relevant characteristics within a group, although this can be easily expanded to capture more flexible aggregation functions. Accordingly, for a given action a , individual i forms a belief over the characteristics of members of group g : $\hat{\mathbb{E}}_i [\bar{q} | g(a)]$. Identity concerns cause these beliefs to enter the utility function directly:

$$U_i(a) = u_i(z_a) + \theta \hat{\mathbb{E}}_i [\bar{q} | g(a)]. \quad (1)$$

Hence, associating oneself through an action with a group that is perceived as negative (positive) creates negative (positive) utility. The parameter θ captures the importance of this type of identity-based utility, relative to the material utility $u_i(z_a)$. Since it concerns people's identity, how people view others may influence their decisions even for decisions that are predominantly unobserved by others, such as investment decisions. A potential micro-foundation for this parameter is that individuals are uncertain about their character traits and infer them from actions (Bénabou and Tirole, 2011).⁸

In the context of investment decisions, there exists the group of stockholder S and non-stockholder NS , defined by whether an individual owns assets traded on the stock market or not. Then, actions based on investing in the stock market, such as buying shares of a mutual fund, putting money in

⁸In our framework, identity concerns generate avoidance of actions associated with negatively viewed groups. Equation 1 can also accommodate avoidance that is generated by a more general form of taste-based preferences. In this case, individuals care about the characteristics of others independent of identity concerns, for instance through moral heuristics. The parameter θ can then be interpreted as the extent of this preference for a given belief, instead of the extent of identity concerns. Our empirical results in Sections 3 and 4 are consistent with both interpretations, while in Section 5.1 we present several pieces of evidence that specifically support identity concerns as the underlying mechanism.

stocks of a specific company, or engaging in options trading, are all associated with the group of stockholders. Suppose individuals can either invest $a = I$ or not invest $a = NI$ in the stock market; hence $g(I) = S$ and $g(NI) = NS$. Maximizing $U_i(a)$, individual i chooses $a = I$ if and only if

$$u_i(z_I) - u_i(z_{NI}) \geq \theta \left(\hat{\mathbb{E}}_i [\bar{q} | NS] - \hat{\mathbb{E}}_i [\bar{q} | S] \right). \quad (2)$$

Accordingly, even if the potential material gains from investing are large, people will abstain from investing if the group of stockholders is viewed as sufficiently negative compared to the group of non-stockholders.

Our framework makes two key testable predictions. The first one builds on the idea that the influence of identity concerns depends on which actions are associated with which groups. The attractiveness of an action should, hence, depend on which group the action is associated with.

Prediction 1. *Assume there are two distinct groups G_1 and G_2 , over which perceptions differ such that G_1 is perceived more positive ($\hat{\mathbb{E}}_i [\bar{q} | G_1] > \hat{\mathbb{E}}_i [\bar{q} | G_2]$). Suppose two actions are the same in every aspect, in particular their respective state-contingent prospect, except that a_1 is associated with G_1 and a_2 with G_2 . Then a_1 is more attractive than a_2 , i.e., $U_i(a_1) > U_i(a_2)$.*

Our framework furthermore predicts that identity concerns depend on people's views of the respective groups. The second prediction, thus, states that the attractiveness of an action is directly influenced by people's views of the group associated with the action.

Prediction 2. *Suppose action a is associated with group G . If the perception of the characteristics of the individuals belonging to G becomes more positive (negative), the attractiveness of action a increases (decreases) relative to other actions not associated with G .*

In the next sections, we empirically test the framework's predictions to assess how people's views about stockholders influence financial decision-making. We proceed with our empirical analysis in three steps. In the first step (distribution and relevance of perceptions – Section 3), we start by measuring people's views of stockholders to test whether people view them differently than non-stockholders on identity-relevant characteristics and whether such views are, on average, negative.

As our theoretical framework highlights, this is an important necessary condition for views to influence behavior (see Prediction 1). We then test whether people's views of stockholders predict their stock market participation. This provides evidence on the relevance of such views to explain why many households abstain from investing. In the second step (causal effect of perceptions – Section 4), we test whether the link between views and behavior is causal. That is, whether people's negative views of stockholders are responsible for their aversion to stock investment, assessing Predictions 1 and 2. In the third and last step (mechanism and origins of perceptions – Section 5), we investigate the role of identity concerns as mechanism for why views influence behavior as well as the origins of negative perceptions.

3 Documenting negative perceptions of stockholders and their relevance for stock market participation

As the first step of our empirical analysis, we measure people's views of stockholders and then relate them to their stock market participation. To do so, we use surveys drawn from two samples with complementary advantages. Our primary sample focuses on a single country, the Netherlands, and contains a broad range of measures for a large and representative population sample. Our secondary sample covers ten countries with different cultural and institutional backgrounds, allowing us to assess the generalizability of our findings (Badarinza et al., 2016).

Dutch sample. For the Netherlands, we fielded two surveys to the LISS (Longitudinal Internet studies for the Social Sciences) panel. The panel is based on a true probability sample of the Dutch population drawn from the population registers in collaboration with Statistics Netherlands (CBS) and administered by Centerdata (Tilburg University). We focus on panel participants who report to be the primary financial decision-maker of their respective household.

Overall, 3,272 panelists participated in our first survey in which we elicited their views of stockholders. In addition, we subsequently fielded a second survey to 1,594 non-stockholders to obtain supplementary measures. See Appendix Table J.1 for a summary of demographic characteristics. The LISS panel is ideally suited for our purpose due to three key features. First, it allows us to measure peo-

ple's views of stockholders among a probability-based broad population sample. Second, we can link participants' responses to other surveys fielded to the LISS panel. Third, and most importantly, we can link participants' responses to Dutch administrative data provided by Statistics Netherlands, which includes information on financial assets of the respective households based on tax records. For each subject who consented to the linkage (89% of our sample), we observe their respective households' financial asset allocation.⁹

Cross-country sample. To measure people's views of stockholders more broadly around the world, we fielded a short survey to individuals living in ten countries in cooperation with the survey company Bilendi. Overall, we have data from 5,130 respondents, around 500 in each of the following countries: Australia, Germany, Italy, Japan, Mexico, South Korea, Spain, Sweden, the United Kingdom, and the United States. Samples are representative for each country with respect to age and gender based on quota sampling. Surveys were translated and back-translated by professional translators. Rare cases of disagreements were resolved by a third translator.

3.1 Documenting negative perceptions of stockholders

This section provides the details on measuring people's views of stockholders and empirical evidence on their distribution.

3.1.1 Measuring people's perceptions of stockholders

Section 2 formulates two conditions for a character trait q to influence decisions related to the stock market. First, the trait needs to be identity-relevant. Second, subjects need to perceive differences in the extent to which they associate it with the group of stockholders and non-stockholders (in our framework with respect to trait h : $\hat{\mathbb{E}}_i [q_h | S] \neq \hat{\mathbb{E}}_i [q_h | NS]$). Based on these conditions, we identified a list of eight potential character traits through an unstructured, data-driven search across various media sources (articles, books, and movies) and psychology literature. We then conducted a pre-test to select three character traits based on the two mentioned conditions, see Appendix C for

⁹Whether we can link a subject to administrative data is unrelated to their views about stockholders and the demographic variables we observe in the LISS: age, gender, and education (more details in Table B.4).

details. We selected the following traits which ranked among the top four traits for each criterion, supplemented with accompanying definitions:¹⁰

Greed A strong wish to continuously get more of things like wealth, possessions or social values.

Gambler A person who shows the tendency to risk money or other stakes in the hope of being successful.

Selfishness Being willing to accept negative consequences for other people or the environment to gain a personal advantage as a result.

Defining stockholders. To elicit perceptions of stockholders for these traits, we asked subjects to consider the entire adult population of their respective country to be divided into two groups: those who hold any risky financial assets and those who do not. We provided subjects with the precise list of assets considered risky financial assets: “risky financial investments include growth funds, share funds, bonds, debentures, stocks, options, and warrants. They do not include banking accounts, saving accounts, bank savings schemes, insurance policies, or real estate.”¹¹ Since the assets categorized as risky financial assets are typically traded on the stock market, we will use the terms “stockholder” and “has risky financial assets” interchangeably.¹²

Elicitation. Subjects stated separately for the group of stockholders and non-stockholders their assessment for each trait (“People who (do not) own risky financial assets are on average …”) on a scale from 0 “totally disagree” to 10 “totally agree.” We chose this measurement because it is easily understood by subjects and straightforward to answer, allowing us to include it even in short surveys.¹³

¹⁰The definitions were based on established psychological formulations, which we slightly altered to increase comprehension. We circulated the definitions among experts and non-experts to ensure that they were both internally valid and easily understood.

¹¹The categorization is based on the corresponding tax category in the Netherlands, ensuring that Dutch subjects are familiar with the categorization and that it matches the respective category in the administrative data. To guarantee comparability between countries, we used the same definition also in our surveys fielded to other countries.

¹²Notably, our definition does not include “indirect” stock market investments through retirement saving plans which are very common in the Netherlands. In our framework, only active decisions matter for identity. Indeed, we find a substantial degree of group identification despite most subjects being enrolled in retirement saving plans that contain stock market investments (see Section 5.1). Results based on linking survey reports with administrative data indicate that individuals correctly disregard indirect investments when faced with our definition: only 2% of subjects who are non-stockholders report being a stockholder in our survey.

¹³For these reasons, similar trait ratings have been employed in the context of political ideology in political science (e.g., Iyengar et al., 2012; Hobolt et al., 2021)

Variables. Through these trait ratings, we obtain a measure of how subjects perceive the characteristics of each group. We define subjects' *average negative perceptions* about stockholders/non-stockholders as the average rating of each group over the three traits. To obtain a single measure, we define *negative views about stockholders* as the difference between subjects' average negative perceptions of stockholders and their average negative perceptions of non-stockholders.¹⁴ We label the variable "negative views" because the three selected traits are described to subjects as being negative. Moreover, while these traits may also have positive aspects in general, subjects view them predominantly negatively (see Appendix C). Hence, higher ratings indicate that subjects view stockholders more negatively relative to non-stockholders.

3.1.2 The distribution of people's perceptions of stockholders

Netherlands. Figure 1 Panel A shows the distribution of subjects' ratings of stockholders and non-stockholders for the three traits greed, being a gambler, and selfishness in the Netherlands. Higher values indicate that the respective group is rated more greedy, gambler-like and selfish. For all three traits, the distribution of ratings of stockholders lies to the right of the non-stockholder distribution, indicating that stockholders are viewed more negatively ($p < 0.001$, Kolmogorov-Smirnov test)¹⁵. At the individual level, a large fraction of subjects rates stockholders strictly more negatively than non-stockholders (64% for greed, 81% for gambler, and 47% for selfishness, $p < 0.001$, Wilcoxon signed-rank test). Moreover, ratings between traits are strongly correlated and show a high degree of internal consistency (Cronbach's $\alpha = 0.80$ for stockholder and $\alpha = 0.86$ for non-stockholder ratings). Comparing average negative perceptions, we observe that 81% of respondents rate stockholders more negatively than non-stockholders. In conclusion, subjects in the Netherlands hold substantial negative views about stockholders.

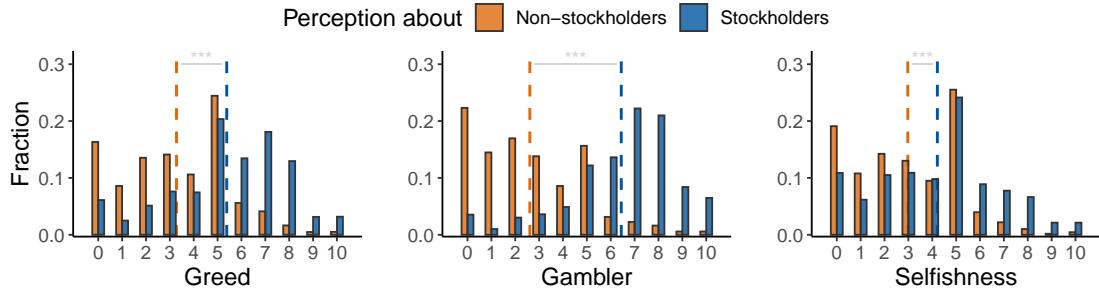
Cross-country. Panel B of Figure 1 shows that negative views about stockholders are not limited to the Netherlands. For our set of eleven countries, the figure displays subjects average negative

¹⁴Our results do not rely on averaging over traits. In particular, our analyses in Section 3.2 yield similar results if we consider each trait separately.

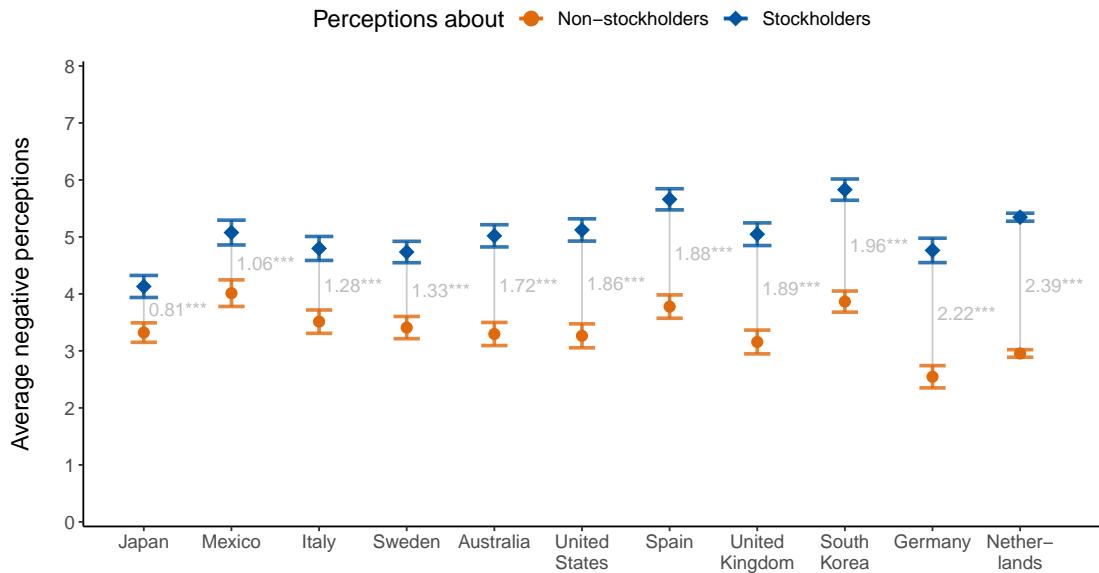
¹⁵All tests refer to two-sided tests. We adjusted these p-values and the subsequent ones in this section for multiple hypothesis testing using Bonferroni correction.

Figure 1: People's perceptions of characteristics of stockholders and non-stockholders

Panel A: Netherlands



Panel B: Cross-country sample



Notes: Panel A displays the distribution of subjects' ratings of the group of stockholders and non-stockholders elicited in the LISS panel. Higher values indicate that subjects rate the respective group as more greedy (left graph), gambler-like (middle graph), and selfish (right graph). The dotted lines display mean ratings. Panel B displays subjects' ratings of the group of stockholders and non-stockholders averaged over the three traits for different countries. Bars indicate 95% confidence intervals. Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

perceptions about stockholders and non-stockholders. In every country, stockholders are rated more negatively on average than non-stockholders. These differences are significant in every instance ($p < 0.001$, Wilcoxon signed-rank test). At the individual level, the data similarly reveal strong negative views. Overall, 64% of subjects rate stockholders strictly more negatively than non-stockholders, with fractions for each country ranging from 49% to 73%.

3.1.3 Robustness and correlates of people's perceptions of stockholders

Robustness to measurement. Is Result 1 an artifact of how we measure views of stockholders?

First, it is important to emphasize that our main measure concerns the difference between subjects' ratings of stockholders and non-stockholders. Thus, biases arising from Likert scales are unlikely to drive the large differences in ratings we find. To further show the robustness of our results, we use a more quantitative elicitation measure and vary whether views are measured over negatively or positively framed items in a separate sample of 1,016 Dutch individuals. We elicit perceptions over nine items that are related to the previously used traits. For each, we replicate our main finding: subjects view stockholders significantly more negatively if views are elicited over a negatively framed item and less positively if elicited over a positively framed item (in every instance, $p < 0.001$, Wilcoxon signed-rank test, Bonferroni corrected). For example, a majority of subjects expect that stockholders act less prosocial in an incentivized dictator game. See Appendix D.1 for details on design and results.

Relation to stock market knowledge, numeracy and trust. Are views about stockholders merely a proxy for individuals' financial numeracy, stock market knowledge or trust in such markets? In our second LISS survey, we collected self-assessed stock market knowledge, a standard measure of financial numeracy, subjects' self-assessed belief whether they would be successful in the stock market, their belief over stock returns, and several trust variables (see Appendix J.3 for variable definitions). Neither self-assessed stock market knowledge ($r = -0.13$), financial numeracy ($r = 0.12$), success belief ($r = -0.07$), or return beliefs ($r = 0.06$) are meaningfully correlated with negative views about stockholders.¹⁶ Turning to trust, we similarly find that views about stockholders are not meaningfully correlated with either general trust ($r = -0.06$), trust in bankers ($r = -0.07$), or trust in financial advisors ($r = -0.04$).

Perceptions over different investments. How do people view different types of stock investors?

Going beyond eliciting views of the general group of stockholders, we presented participants of our second LISS survey with investors who (i) only invest in socially responsible investments (SRI), (ii) only invest in market index funds, and (iii) explicitly use financial derivatives (options, swaps, and

¹⁶On average, subjects' return beliefs are well-calibrated to historical returns. Hence, while subjects have negative views about stockholders, their beliefs about stock returns are not negatively biased.

warrants). Participants rated how selfish they perceived each group of investors. We find that participants differentiate in their perceptions between types of stock investors: compared to stockholders in general, SRI and index fund investors are perceived significantly less negative ($p < 0.001$, paired t-test, Bonferroni corrected), while investors that use derivatives are perceived as more negative ($p = 0.017$). Nonetheless, all three groups are still viewed significantly more negative than non-stockholders ($p < 0.001$).

Relation to socio-demographic variables. Do negative views vary with socio-demographic background? Using the first LISS survey, we regress negative views about stockholders on a set of background variables. We find that women and older subjects hold significantly more negative views and observe no difference with respect to education, income, and wealth. For details on the regression results, see Appendix Table B.1. In general, negative views are remarkably robust across socioeconomic groups: within each income, wealth, education and age tercile, as well as for both men and women, stockholders are viewed significantly more negative. Hence, our identity-relevant set of views appear to be held uniformly across the socioeconomic spectrum.

In sum, we find robust support for the necessary condition outlined in our framework (Prediction 1) for views to influence behavior.

Key Result 1. *Perceptions of stockholders and non-stockholders differ significantly on identity-relevant characteristics. On average, stockholders are viewed more negatively than non-stockholders, and such views are widespread across a diverse set of countries.*

3.2 The relevance of perceptions of stockholders for stock market participation

Having established that people hold negative views about stockholders, we turn to the second part of the first step of our analysis: investigating the relevance of people's views for households' stock market participation decisions.

Result for the Netherlands. We regress a dummy variable indicating whether the household holds any risky financial assets on their standardized views of stockholders using OLS.¹⁷ We control for the socio-demographic variables age, gender, level of education, income, and wealth (see Appendix J.2 for details). Linking our data to previous surveys in the LISS panel (in particular von Gaudecker et al., 2025), we further make use of a set of preference, attitude, and belief measures that the literature has identified as the most important behavioral predictors of households' portfolio choices: (i) risk aversion, the key preference parameter in standard portfolio models capturing attitudes towards known probabilities, (ii) ambiguity aversion and (iii) ambiguity-induced likelihood insensitivity, capturing attitudes towards unknown probabilities (Baillon et al., 2018), (iv) return expectations (Hurd et al., 2011) and (v) financial numeracy (van Rooij et al., 2011), capturing households' understanding of the fundamentals of the stock market. Finally, (vi) general trust and (vii) political orientation capture the role of social and ideological worldviews in shaping portfolio decisions (Guiso et al., 2008; Kaus-tia and Torstila, 2011). We elicit each variable using state-of-the-art methods; see Appendix J.4 for details. The full set of variables is available for 46% of our sample.

Table 1 displays the results. Column (1) reveals that the more negatively subjects view stockholders compared to non-stockholders, the less likely they are to possess risky financial assets themselves: an increase in negative views about stockholders by one standard deviation is associated with a reduced likelihood of possessing risky financial assets by almost 6 percentage points. This is a substantial effect, as the baseline likelihood is 23 percentage points. Column (2) reveals that the relation is only slightly smaller and remains significant when we control for the demographic variables. In column (3), we focus on the subsample of subjects for which we have measures of behavioral variables that plausibly influence portfolio choice.¹⁸ We replicate the relationship with stock market participation documented by the literature for all other behavioral predictors except for financial numeracy and political orientation.¹⁹ The effect of negative perceptions remains substantial and significant. We find

¹⁷Probit regressions yield similar results.

¹⁸This subsample differs from the full sample along some demographic variables (e.g., age). This is expected, as most of the variables are elicited in earlier questionnaires. Importantly, negative views about stockholders and stock market participation rates do not vary significantly between the samples (more details in Appendix Table B.3).

¹⁹In bivariate regressions, financial numeracy and political orientation significantly predict whether households own risky financial assets.

Table 1: The relationship between negative views about stockholders and stock market participation

	Has risky financial assets			Share of risky financial assets (among risky financial asset holders)		
	Full sample		Subsample	Full sample		Subsample
	(1)	(2)	(3)	(4)	(5)	(6)
Negative views about stockholders	-0.058*** (0.007)	-0.052*** (0.007)	-0.048*** (0.010)	-0.015 (0.013)	-0.013 (0.013)	-0.030* (0.017)
Behavioral variables						
General trust			0.024** (0.010)			0.011 (0.021)
Ambiguity aversion			-0.021** (0.010)			-0.004 (0.019)
Likelihood insensitivity			-0.021* (0.011)			0.012 (0.019)
Belief over positive stock returns			0.063*** (0.011)			0.030* (0.016)
Risk aversion			-0.036*** (0.010)			-0.040* (0.021)
Financial numeracy			-0.000 (0.011)			0.011 (0.023)
Right-wing political orientation			0.011 (0.010)			-0.007 (0.018)
Socio-demographic variables						
Female		-0.075*** (0.015)	-0.017 (0.021)		-0.006 (0.023)	0.023 (0.035)
Age		0.000 (0.000)	0.001 (0.001)		0.004*** (0.001)	0.003** (0.001)
Education: upper secondary		0.021 (0.018)	0.007 (0.026)		0.023 (0.040)	0.080 (0.049)
Education: tertiary		0.123*** (0.019)	0.102*** (0.030)		0.072* (0.039)	0.116** (0.049)
Income 2nd tercile		-0.009 (0.017)	-0.011 (0.026)		-0.023 (0.035)	-0.032 (0.045)
Income 3rd tercile		0.083*** (0.021)	0.048 (0.032)		-0.001 (0.034)	-0.030 (0.047)
Wealth 2nd tercile		0.070*** (0.017)	0.074*** (0.025)		-0.015 (0.041)	0.084 (0.062)
Wealth 3rd tercile		0.267*** (0.020)	0.289*** (0.030)		0.030 (0.045)	0.158*** (0.060)
Mean dep. variable	0.228	0.226	0.238	0.359	0.352	0.345
Observations	2915	2903	1410	665	657	335

Notes: OLS estimates with the dependent variable in Columns (1)-(3) equal to one if the subject owns risky financial assets and zero otherwise. In Columns (4)-(6), the dependent variable is the share of risky financial assets as a percentage of all financial assets as dependent variable. “Negative views about stockholders” is defined in section 3.1.1. See Appendix J.4 for details on the other independent variables. “Negative views about stockholders” and all behavioral variables have been standardized. Robust standard errors in parentheses. Significance levels: * p<0.1; ** p<0.05; *** p<0.01.

that a one-standard-deviation increase in negative views is associated with a 4.8 percentage point decrease in the likelihood of owning risky financial assets. The estimated marginal effect is larger than the marginal effect of, for instance, risk or ambiguity aversion. In our regression, views about stockholders are, therefore, among the strongest behavioral predictors.²⁰ In Columns (4)-(6), we fo-

²⁰In subsequent work, Scherf et al. (2024) similarly compare the predictive power of a set of behavioral

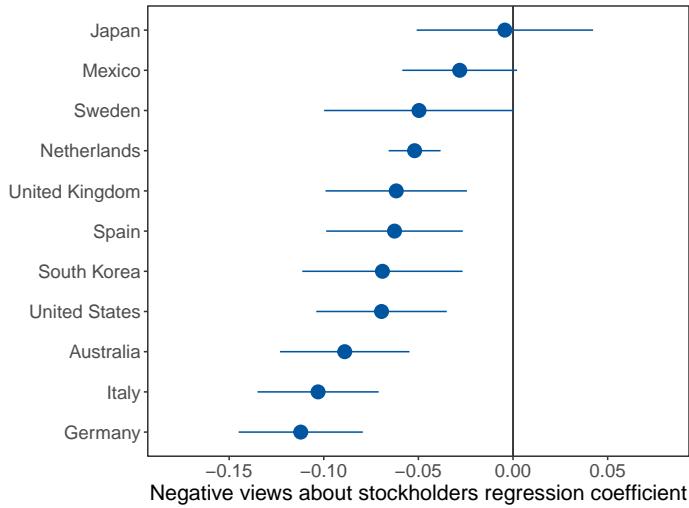
cus on the set of households that hold a non-zero amount of risky financial assets and use as the dependent variable the share of risky financial assets of total financial assets. Since decisions over the share of one's portfolio in stocks conditionally on owning stocks are associated with the group of stockholders, our framework predicts that negative perceptions of stockholders should play only a limited role. Indeed, we find no significant association between the share invested in risky financial assets and negative perceptions of stockholders in the full sample and only a marginally significant association in the subsample.

Result for the cross-country sample. Do negative perceptions of stockholders also predict stock market participation in other countries? Figure 2 displays for each country the result of an OLS regression with negative views of stockholders as independent and a dummy variable indicating whether a subject holds any risky financial assets (self-reported) as the dependent variable. We find that negative views of stockholders predict participation in all countries except Japan, with seven out of ten countries having a coefficient significantly different from zero at the 5% level. Running a regression using all countries with country fixed-effects, we find that a one-standard-deviation increase in negative perceptions is associated with a 6.9 percentage point decrease in stock market participation (see Appendix Table B.2). Hence, our findings from the Netherlands generalize to our larger set of surveyed countries.

Heterogeneity. How does the association of negative perceptions and stock ownership vary over demographic groups? We build dummy variables for each demographic variable and interact them with our negative perception measure, controlling for the other demographic and behavioral variables. While we find negative coefficients for all groups, the effect is larger among wealthy, male, educated and older subjects (see Appendix Figure A.4 for details). The common theme is that we find stronger effects among those subgroups that are more likely to invest in risky financial assets. This suggests that perceptions act as a moderator to constraints such as limited wealth. If a household has no money to invest, views about stockholders do not matter for their decision-making. In contrast, negative

variables for stock market participation. They also find that return expectations and a prejudice variable - which, among other items, includes the extent to which people believe investing is only for "gamblers" - are among the strongest predictors.

Figure 2: The relationship between negative views about stockholders and stock market participation across countries



Notes: OLS coefficients from regressing whether subjects hold risky financial assets on their negative views about stockholders (as defined in Section 3.1.1), controlling for age and gender. For the Netherlands, the coefficient of column (2) in Table 1 is used. Bars indicate 95% confidence intervals.

perceptions can explain why even wealthy and educated households often do not invest.

Overall, our results in this section support the following key result:

Key Result 2. *People's negative views about stockholders significantly predict their stock market participation. The estimated relationship is large and holds across countries.*

While we control for a wide range of variables that the literature established as potential drivers of stock investments, currently unaccounted factors may exist that affect both perceptions and decisions.²¹ Moreover, if people hold motivated beliefs, i.e., develop more favorable views of stockholders after becoming stockholders themselves, or rationalize their non-participation by adjusting their views about stockholders downwards, reverse causality could bias the estimated relations in this section.²² To address these concerns, we examine the causal effect of perceptions on financial decisions in the next section.

²¹As a potential bounding exercise we can compare the decrease in absolute effect size when controls are added to the associated increase in the R^2 as proposed by Oster (2019). Setting $R_{max}^2 = 1.3 \cdot R_{controls}^2$ following Oster (2019), we find that selection on unobservables would need to be more than seven times stronger than selection on observables to fully account for the estimated effect. This seems unlikely given the rich set of observed determinants included in the model.

²²Moreover, our perception measure includes only traits where stockholders are viewed negatively. There may, however, also be traits for which stockholders are viewed positively on average, for instance confidence or ambition. If such traits are identity-relevant, they might influence financial decisions. How these views interact with the association between negative perceptions and investment behavior depends on how views of such traits are correlated with negatively viewed traits.

4 The causal effect of perceptions of stockholders on financial decision-making

In the second step of our analysis, we investigate whether people's perceptions of stockholders causally influence financial decision-making. We use a two-part approach. In the first part, we construct a decision environment and treatment variation that enable clean identification of stock aversion behavior. This stock aversion is predicted by our framework: all else equal, non-stockholders should avoid options that are associated with stockholders (Prediction 1). We test this using a *framing experiment*, described in Section 4.1, with the results in Section 4.1.2. In the second part, we examine whether people's views of stockholders drive the documented stock aversion behavior, i.e., whether they causally influence investment behavior. This tests Prediction 2 of our framework: the extent to which non-stockholders avoid stock options should depend on how they perceive stockholders. We test this prediction using an *information experiment*, described in Section 4.2, with the results in Section 4.2.2.

Data. We use US participants recruited on Prolific for both the framing and information experiment.²³ In total, 651 subjects completed the framing experiment, with a median completion time of about 7 minutes, for which subjects received £0.9 ($\approx \$1.13$) for completion. The information experiment was completed by 652 subjects, who took a median time of 9.5 minutes and received £1.2 for completion. In each of the two experiments, ten randomly selected subjects had one of their decisions implemented with real consequences. Both experiments were preregistered, see Appendix I for details. In accordance with the preregistration, we exclude 136 subjects from the framing experiment and 104 subjects from the information experiment who indicated that they are stockholders. This results in a sample of 515 subjects for the framing experiment and 548 for the information experiment (sample demographics in Appendix Table J.3). We used oTree (Chen et al., 2016) for programming. Experimental instructions are available at <https://osf.io/qz8ab/>.

²³As we document in Appendix D.2, participants on Prolific hold substantial negative views about stockholders, just as the general US population.

4.1 Framing experiment

In the framing experiment, we present subjects with simple incentivized investment decisions with fixed and known outcomes and probabilities and exogenously vary the description of the decisions' options using a framing manipulation. This setup serves two purposes. First, by employing a framing variation - using different language to describe identical assets - we can cleanly test whether subjects avoid stock investments. This is because such a variation holds constant outcome-related influences on behavior such as wealth or risk preferences, which matter greatly in our field data. Second, by implementing and validating an investment decision in which the outcomes and probabilities are known and fixed, we establish a foundation for the later information experiment. This setup allows us to cleanly identify how exogenous changes in subjects' perceptions through information influence their stock avoidance behavior. The key idea is that, although exogenous changes in perceptions might also affect subjects' beliefs about other aspects of investments, such aspects cannot influence their choices when the outcomes and probabilities are known and fixed.

4.1.1 Framing experiment design

Decisions. Subjects in the experiment face two decision parts. Each decision part consists of four investment decisions. In each decision, subjects are endowed with \$30 and choose between a safe and a risky option. By choosing the risky option, subjects pay an amount $c < \$30$ and receive with 50% probability a high outcome $x_h > c$ and with 50% probability a low outcome $x_l < c$ as additional payment. Choosing the safe option yields the endowment as additional payment with certainty. Across the four decisions, we vary the amount c as well as the outcomes x_h and x_l . We include multiple decisions to allow for fine-grained variation in subjects' choices. For further details, see Appendix F.

Framing manipulation. To vary the association of the decisions with the stock market, we use two different framings to describe the risky and safe options to subjects, the *Stock* and the *Draw Framing*. Table 2 shows the descriptions, starting in the first column with the description given to subjects in the *Stock Framing* treatment. Here, the risky option is described as a bet on past stock market prices. Subjects are told that they could buy one share of an (actual existing) ETF at a price at which the ETF

had traded at a specific point in time in the past (pay amount c). The share would then be randomly sold at one of two subsequent past points in time. We selected the points such that the selling price was higher than the buying price at one point and lower at the other. Subjects would then receive the realized selling price of the ETF as payment immediately after the experiment (receive x_h or x_l). The safe option is described as abstaining from betting on the stock market (receive the endowment with certainty). We will show in Section 4.3 that choices in this decision environment strongly predict real-world investment behavior, thereby validating their informativeness about people's investment attitudes.

In the *Draw Framing* treatment, all references to the stock market are replaced by neutral wording as depicted in the second column of Table 2. The risky option is described as a ticket for a random draw (pay amount c). One out of two outcomes would then be randomly selected. One outcome was higher than the cost of the ticket, while the other was lower. Subjects would then receive the corresponding amount as payment immediately after the experiment (receive x_h or x_l). The safe option is described as abstaining from betting on the outcome of a random draw (receive the endowment with certainty).

Importantly, the treatments vary only in how the options are described. The buying prices c and outcomes x_l and x_h are identical between treatments. As all selling dates in the *Stock Framing* treatment were in the past, the payment procedure and timing is identical between treatments as well. Moreover, we designed the descriptions to be as similar as possible in terms of complexity and length, changing only the labels of the options. To further reduce the scope for misunderstandings between descriptions, we gave subjects the respective expected value of the risky option.²⁴

Treatment assignment. For the first decision part, we randomly assigned subjects to either the *Draw Framing* treatment or to the *Stock Framing* treatment. Comparing choices between treatments thus identifies the effect of varying the association of the options with the stock market (between-subject variation). After the first part, subjects answered demographic questions intended as filler questions and subsequently unexpectedly faced a second decision part. Here, subjects again make four decisions.

²⁴Nieddu and Pandolfi (2021) also vary descriptions to study the influence of financial literacy. They frame a simple lottery as either a coin toss or in financial terms (e.g., defaults, future value), the latter thus requires financial literacy to understand. We deliberately described the payoff structure without financial terms in both cases and provided the expected value to ensure that subjects understood both descriptions equally well.

Table 2: Framing experiment illustration of choice options

Stock Framing	Draw Framing																
In this section, you will make 4 decisions. In each decision, you will separately receive \$30 from us. With this money, you can choose between two options: Option A: Participate in the stock market by buying a share. The value of the share depends on the movement of the stock market. Option B: Do not participate in the stock market. In each decision, you will have the option to buy a different share. Each share has a different price and offers different returns. The decisions are presented independently of each other. That is, your choice in one decision does not affect the other decisions.	In this section, you will make 4 decisions. In each decision, you will separately receive \$30 from us. With this money, you can choose between two options: Option A: Participate in a random draw by buying a ticket. The value of the ticket depends on the outcome of the random draw. Option B: Do not participate in the random draw. In each decision, you will have the option to buy a different ticket. Each ticket has a different price and offers different prizes. The decisions are presented independently of each other. That is, your choice in one decision does not affect the other decisions.																
Example of Option A:	Example of Option A:																
<table> <thead> <tr> <th></th> <th>Share Price MSCI World ETF</th> </tr> </thead> <tbody> <tr> <td>2010 (Buying Price)</td> <td>\$27.19</td> </tr> <tr> <td>2011</td> <td>\$25.06</td> </tr> <tr> <td>2016</td> <td>\$37.21</td> </tr> </tbody> </table>		Share Price MSCI World ETF	2010 (Buying Price)	\$27.19	2011	\$25.06	2016	\$37.21	<table> <thead> <tr> <th></th> <th>Prize</th> </tr> </thead> <tbody> <tr> <td>Buying Price</td> <td>\$27.19</td> </tr> <tr> <td>Outcome 1</td> <td>\$25.06</td> </tr> <tr> <td>Outcome 2</td> <td>\$37.21</td> </tr> </tbody> </table>		Prize	Buying Price	\$27.19	Outcome 1	\$25.06	Outcome 2	\$37.21
	Share Price MSCI World ETF																
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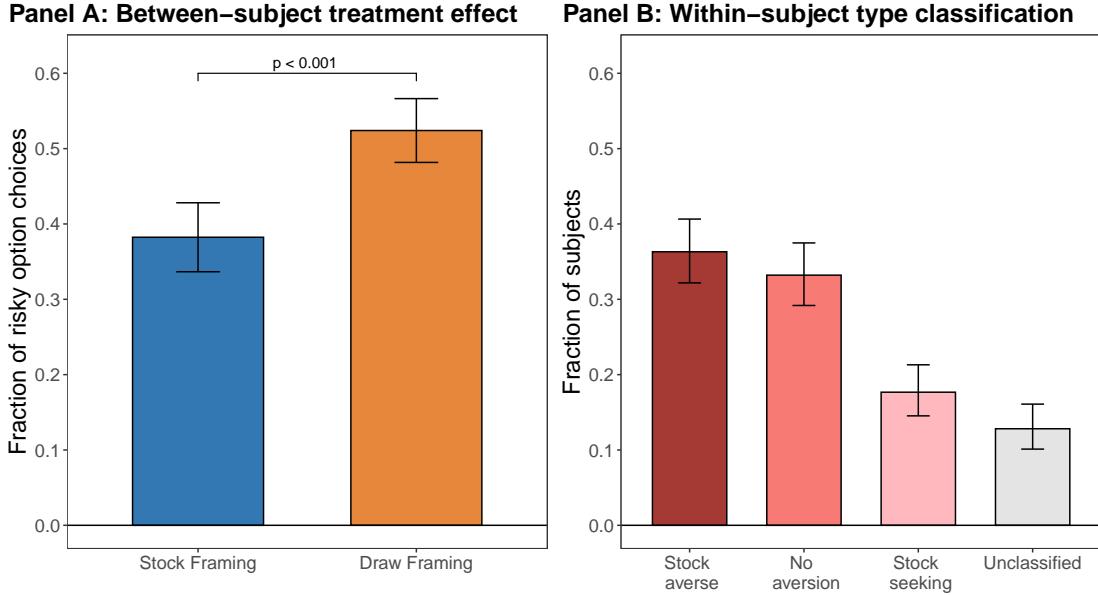
Subjects who received the *Stock Framing* before subsequently receive the *Draw Framing*, and vice versa. This variation allows us to investigate preferences at the individual level since we observe the same subjects making choices under the different descriptions (within-subject variation).²⁵

4.1.2 Framing experiment results

Between-subject analysis. Overall, 260 subjects of our sample were part of the *Draw Framing* treatment and 255 were part of the *Stock Framing* treatment. Appendix Table B.4 shows that treatments were balanced across demographic variables. Panel A of Figure 3 displays the treatment effect on decision-making. We find that subjects in the *Draw Framing* treatment choose the risky option in, on average, 52% of their decisions (i.e., in 2.10 out of the 4 possible decisions). In comparison, subjects in the *Stock Framing* treatment choose the risky option in only 38% of decisions. Hence, sub-

²⁵To avoid consistency effects, we obfuscate that the values of the options are repeated by changing the presentation of the decision's options in two aspects. First, outcomes are visualized in the form of tables in one set of questions and as figures in the other. Second, the currency used is either dollar or the British pound. Since payments on Prolific are always made in pounds and subjects are located in the US, they are familiar with both currencies. Appendix Figure A.1 displays the four possible visualizations. Reassuringly, choices in the experiment do not differ by visualization or currency ($p = 0.83$ and $p = 0.85$, respectively, Wilcoxon rank-sum test).

Figure 3: Framing experiment results: aggregate and individual behavior



Notes: **Panel A** displays the fraction of decisions in which subjects choose the risky instead of the safe option using only the choices of the first decision part. *Stock Framing* denotes the treatment in which the risky option is described as a stock investment and *Draw Framing* the treatment in which the risky option is described as a random draw. **Panel B** displays the distribution of types identified by the within-subject analysis (see Section 4.1.2 for type definitions). Error bars indicate 95% confidence intervals.

jects are 27% less likely ($p < 0.001$, Wilcoxon rank-sum test) to choose the risky option when it is described as a bet on the stock market instead of a bet on a random draw, even though the values underlying the option are identical.²⁶ The difference is similarly large and significant in a complementary regression analysis in which we control for demographic variables (Panel A of Appendix Table B.5). Moreover, analyzing the sum of risky option choices, we find that while only 19% of subjects never choose the risky option within the *Draw Framing* treatment, this fraction almost doubles to 36% in the *Stock Framing* treatment.

Within-subject analysis. By using our within-subject variation in descriptions, we can categorize subjects into distinct behavioral types. That is, we include subjects' four risk choices of the second decision part, which means we observe subjects' choices under both descriptions, resulting in four *Stock-Draw* choice pairs that reveal people's preference types.²⁷ For a given choice pair, we define a strict preference for the random draw if a subject chooses the risky option when it is described as

²⁶Our results are similar if we only consider the first decision each subject makes.

²⁷We can also use the full set of decisions to analyze the within-subject treatment effect of the descriptions. As Panel B of Appendix Table B.5 shows, the resulting difference is similar to the between-subject effect.

random draw and the safe option when the risky option is described as stock investment. We define a strict preference for the stock investment if the reverse happens: a subject chooses the safe option under the draw description but the risky option under the stock description. Subjects are *stock averse* if they, across the four choice pairs, show a strict preference for the random draw for at least one pair and for none of the pairs a strict preference for the stock investment. Accordingly, subjects are *stock seeking* if they show a strict preference for the stock investment at least once and no strict preference for the random draw. Subjects display *no aversion* if they have no strict preference, meaning they consistently choose the same option within each choice pair. The remaining subjects are labeled *unclassified*. These subjects show at least one strict preference for the stock investment and at least one for the random draw across the four choice pairs. Figure 3 displays the distribution of types. Overall, 36% of subjects are *stock averse*, 33% display *no aversion*, 18% are *stock seeking*, and the remaining 13% show no consistent preferences across descriptions (*unclassified*).

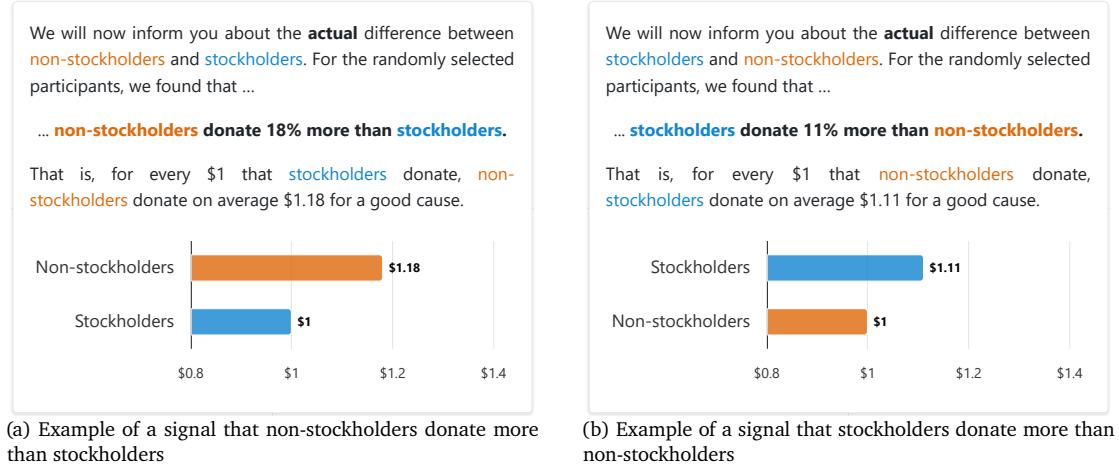
Key Result 3. *In line with Prediction 1, subjects are averse to choice options associated with the stock market relative to otherwise identical options lacking that association.*

In our framework, individuals are averse to stock investments because of their negative views of stockholders. The results from the framing experiment provide empirical support for this mechanism, but alternative explanations could also account for the observed aversion behavior. For instance, it could be that despite the fact that the risky option is a simple 50/50 gamble and we highlight its odds and expected value, subjects misperceive the option's odds or perceive the option as more complex when it is framed as a stock decision. Alternatively, people might view stock investments as inherently immoral (Laudenbach et al., 2024), which could drive both their negative perceptions of stockholders and investment decisions. To rule out these alternative explanations, we vary subjects' views in the next section, thereby providing causal evidence on the effect of views on stock aversion behavior.

4.2 Information experiment

The previous section established that even when all outcome-related factors of an investment are held constant, a significant fraction of people still avoid stock investments. In this section, we examine

Figure 4: Information experiment illustration of signals provided



whether subjects' negative views of stockholders cause this aversion behavior. Specifically, we test Prediction 2 of our framework: a change in people's views of stockholders changes their attitude towards stock investments. For this purpose, we require an exogenous shift to people's perceptions of stockholders. We thus conduct a second experiment in which we provide subjects with information about the difference in donation behavior between stockholders and non-stockholders. We choose information about donation behavior because it is closely linked to people's perception of traits such as greed and selfishness, and people consider it relevant and informative (e.g., Ariely et al., 2009; Grossman and van der Weele, 2017; Exley et al., 2023; Bénabou et al., 2024). Therefore, we expect this information to shift subjects' perceptions of the difference in the traits of selfishness and greed between stockholders and non-stockholders.

4.2.1 Information experiment design

Information generation. In order to generate data for the information, we ran a separate experiment on Prolific with 272 participants, which we label *allocators*. Allocators consisted of both stockholders and non-stockholders. They were given \$100, which they could freely divide between themselves and a charity that supports children with critical illnesses. For a randomly selected subset, this donation decision was implemented with real consequences.

Experimental variation. The key feature of the design is that we exogenously vary the information that subjects receive. For each subject, we individually and randomly selected ten allocators who indicated that they hold stocks and ten who indicated that they do not hold any stocks. To control for the fact that stockholders often have higher income, which could interfere with subjects' interpretation of the signal, we drew these 20 allocators from the same income bin (using three bins). The entire procedure was transparently described to subjects.²⁸ As information, subjects received the percentage difference in donation behavior between the randomly drawn stockholders and non-stockholders. Specifically, subjects were presented the following sentence: "For the randomly selected participants, we found that [GROUP 1] donate [X]% more than [GROUP 2]." Figure 4 provides two example screenshots of such information. Consequently, some subjects receive the information that stockholders donated more than non-stockholders, while others learn that in their draw non-stockholders donated more, each with different percentage differences. To ensure that subjects paid attention, they had to repeat the information on the subsequent page.

Treatment variables. For the analyses, we use the signal about differences in donation behavior as independent variables in two different ways. First, a dummy variable equal to one if the subject received the signal that stockholders donated more than non-stockholders, and equal to zero if they donated a lesser or an equal amount.²⁹ Second, the full signal as continuous variable where higher values indicate that the selected stockholders donated more relative to the selected non-stockholders.

Outcome variable. To cleanly identify the causal effect of varying perceptions on financial decision-making, we make use of the controlled decision environment of the previous experiment (Section 4.1). After receiving the information about donation behavior, subjects made four incentivized decisions between a safe option and a risky option described as a stock investments (stock option), just as in the *Stock Framing* treatment of the framing experiment. Our main outcome variable is thus subjects' willingness to invest in the stock option.

²⁸They were also informed about the relationship between behavior in the donation decision and other relevant real-life behavior. For example, we explained that research has shown that people who donate more in such a decision are also more likely to do voluntary work (e.g., Falk et al., 2018).

²⁹Less than 5% (25 subjects) received the signal that both groups donated an equal amount. We chose to pool them to maintain a dichotomous variable. Our results are quantitatively very similar if we pool these subjects with those that received the signal that stockholders donated more or if we exclude them from the analysis.

As explained previously, we use the framing experiment's choice paradigm to fix the investments' outcomes and probabilities. Thus, even if subjects update about secondary factors unrelated to their perceptions of stockholders such as their beliefs of the profitability or riskiness of stock investments, this secondary updating should not influence decision-making in our experiment. Furthermore, since all subjects receive information, we hold constant factors such as priming or attention that could influence decision-making independent of the information's content. We are, hence, confident in assuming that outcome-based utility is unaffected by our treatment variation, allowing us to directly observe the causal effect of varying perceptions about characteristics of stockholders compared to non-stockholders.

Procedure. Prior to receiving the donation behavior information, subjects made four incentivized choices between a safe option and a risky option described as a random draw, using the same procedure as in Section 4.1. This allows us to use subjects' decisions in a non-stock setting as a control when analyzing the effect of the information, increasing statistical power. Subjects subsequently state their prior belief about the difference in donation behavior between stockholders and non-stockholders, and then receive the signal about the difference in donation behavior. Afterwards, subjects made the four incentivized decisions between a safe option and a risky option described as a stock investment. Finally, we elicited subjects' perceptions of stockholders and non-stockholders (posterior belief) using the module developed in Section 3.

4.2.2 Information experiment results

Signal distribution and prior beliefs. Overall, 61% of subjects received the information that non-stockholders donated more than stockholders or that they donated the same amount, while 39% of subjects received the information that stockholders donated more. The mean of the full signal variable is -10% (median -6%), but with substantial variation, see Appendix Figure A.2 for the entire distribution. We find that prior to receiving the information, subjects believe the randomly selected group of stockholders donate 15 pp. less than the group of non-stockholders. That is, we replicate the results of Section 3 in our experimental sample: subjects view stockholders more negatively. Appendix Figure A.3 displays the distribution of prior beliefs. As expected, prior beliefs were not correlated with

Table 3: Information experiment treatment effect on perceptions and behavior

	Dependent variable:				
	Perceptions about stockholders			Choice of stock option	
	Selfishness (1)	Greed (2)	Gambler (3)	(4)	(5)
Signal over donation behavior	−0.190*** (0.034)	−0.150*** (0.033)	−0.049 (0.031)	0.009** (0.004)	0.009** (0.004)
Choice of draw option				0.239*** (0.025)	0.240*** (0.025)
Mean dep. variable	1.52	1.96	5.01	0.45	0.45
Prior beliefs	X	X	X	X	X
Demographic controls					X
Subjects	548	548	548	548	541
Observations	548	548	548	2,192	2,164

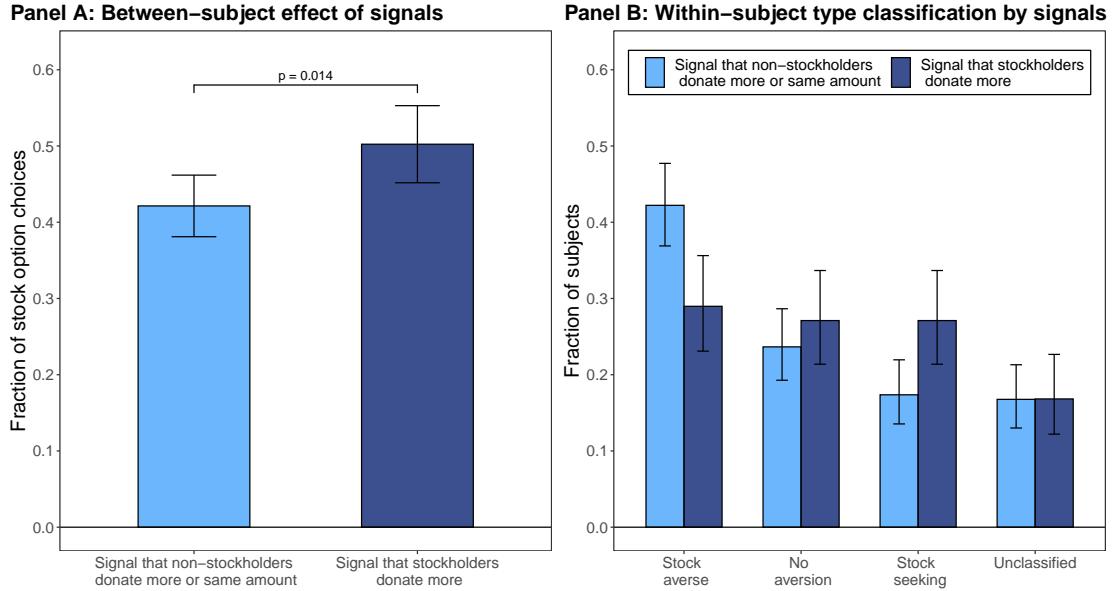
Notes: The table displays OLS estimates. The dependent variable in Columns (1) – (3) is the difference in perceptions about stockholders and non-stockholders where higher values indicate that stockholders are perceived to be more selfish (column (1)), greedy (column (2)), or gambler-like (column (3)). The dependent variable in Columns (4) – (5) is an indicator whether the risky option described as a stock investment is chosen over the safe option. “Signal over donation behavior” denotes the signal subjects receive regarding the difference in donation behavior between non-stockholders and stockholders. Higher values indicate that subjects receive the signal that stockholders donate more relative to non-stockholders, with the unit being 10% differences. “Choice of draw option” is an indicator of whether the respective risky option is chosen when described as a random draw investment. Prior beliefs are subjects’ prior belief over the differences in donation behavior between stockholders and non-stockholders. Demographic controls include age, gender, education, income, total financial assets, and involvement in household decision-making. Standard errors (in parentheses) are clustered at the subject level. Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

the randomly generated signal ($r = 0.01, p = 0.89$). Appendix Table B.4 further shows that signals were not correlated with demographic variables either.

Effect on posterior beliefs. We start by investigating the impact of the signal on posterior beliefs. In Table 3, we regress differences in subjects’ rating of the selfishness (column (1)) and greed (column (2)) of stockholders compared to non-stockholders on the signal about the difference in donation behavior between the two groups. As intended, the information significantly shifts perceptions: the higher the signal, the lower the subject’s negative perception of stockholders. At the same time, we observe only a limited and insignificant impact of the signal on differences in ratings of the trait “gambler” (column (3)), which is reassuring as the information provided was not related to this trait.

Effect on behavior. Our main variable of interest is subjects’ likelihood of choosing the stock option. Panel A of Figure 5 displays the results for the binarized signal variable. Subjects who receive the information that non-stockholders donated more choose the stock option in 42% of cases. This number

Figure 5: Information experiment results: aggregate and individual behavior



Notes: **Panel A** displays the average fraction of decisions in which subjects choose the risky option depending on the signal they received, using only the choices of the first decision part. **Panel B** displays the distribution of types identified by the within-subject analysis (as described in Section 4.1.2). Error bars indicate 95% confidence intervals.

increases to 50% for those subjects who learn that stockholders donated more ($p = 0.014$, Wilcoxon rank-sum test). In Panel B of Figure 5, we repeat our classification of subjects into the four behavioral types (*stock averse*, *stock seeking*, *no aversion*, *unclassified*). When subjects receive the information that stockholders donate more than non-stockholders, they are significantly less likely to be *stock averse* ($p = 0.002$, two sample test of proportions), and instead are more likely to show *no aversion* or *stock seeking* behavior.³⁰ At the same time, the fraction of unclassified subjects is not affected by the information. Therefore, we obtain causal evidence that information about differences in donation behavior influences stock investment behavior.

In Table 3 Columns (4) and (5), we include the full distribution of signals, controlling for subjects' prior beliefs and their respective choice when options are described as a random draw. The dependent variable is the choice of the risky option when described as a stock investment. The independent variable is the signal that subjects receive over the difference in donation behavior between stockholders and non-stockholders as continuous variable, with higher values indicating that stockholders donate

³⁰Similarly, we see a significant decrease in the fraction of subjects who refuse to choose the stock option in any decision ($p = 0.039$, two sample test of proportions).

more relative to non-stockholders. We find a significant effect of the signal on behavior: the more positive the information that subjects receive regarding the donation behavior of stockholders, the higher the likelihood that they choose the stock option. More specifically, a 10% increase in the signal increases the likelihood by 0.9 pp. This effect is sizable, because a one-standard-deviation (40%) increase in the signal helps to decrease the description effect found in the previous experiment by 25% (3.6 out of 14.2 pp.). The results do not change when we control for demographic variables.

Instrumental variable analysis. Complementary to our regression analysis, we use the exogenously assigned signal as an instrumental variable to estimate the causal effect of perceptions on financial decision-making. The analysis rests on the assumption that the documented effect of our treatment on financial decision-making operates solely through changes in perceptions of stockholders. This assumption seems plausible, as by design, the identifying variation comes from differing information about the difference in donation behavior between stockholders and non-stockholders. Empirically, as shown in Table 3, we have a strong first stage. For the two treated traits of greed and selfishness, the respective F-statistics are 21.01 and 32.24. Using 2SLS-regressions, we find that a one-standard-deviation increase in subjects perceptions of stockholders, induced by the signal, decreases the likelihood of investing in the stock option by about 16 pp. For details, see Appendix Table B.6.

4.2.3 Follow-up survey for robustness

We conducted a follow-up survey after the information experiment to address the concern that experimenter demand effects drive the observed effect of the information and investigate whether the information changed subjects' intentions to invest their own money in the stock market. Experimenter demand effects occur when participants try to guess the experimenter's objective from the instructions and alter their behavior accordingly. We do not expect experimenter demand effects to be relevant in our context, as our primary outcome is incentivized.³¹ Nevertheless, we obfuscated the follow-up survey to address this concern in the context of our study. The idea is to run a separate study where the same subjects are invited, but they are unaware that the studies are connected. If this obfuscation

³¹Experimental evidence shows that demand effects often have little impact on responses (De Quidt et al., 2018; Danz et al., 2023) even for hypothetical questions where it is presumably less costly for subjects to alter their answers relative to their “natural” choice (Mummolo and Peterson, 2019).

is successful, demand effects cannot drive effects found in the follow-up study.

Design. Two days after the information experiment, we fielded another study via Prolific. We invited only subjects of the main experiment, utilizing that subjects on Prolific regularly receive survey invitations. In the survey, we elicited subjects intention to invest in the stock market in the future using a 7-point Likert scale. We elicited perceptions by asking subjects how selfish they view non-stockholders compared to stockholders (9-point Likert scale).

Obfuscation. To obfuscate the follow-up survey, we altered the survey's description, visual style, responsible researcher and institution. We also embedded our variables of interest within a battery of questions on other topics. In particular, we elicited subjects intention to engage in a variety of behaviors such as the intention to behave more environmentally friendly or buy disability insurance. Similarly, our question measuring perceptions of stockholders was embedded in a larger battery of questions asking subjects about different groups and personality traits. Hence, in both cases our variable of interest appeared to subjects as one of many variables. Appendix G provides further details.

Obfuscation validation. By offering high incentives (an extrapolated hourly wage of \$18.65), we were able to recruit 428 subjects (78%) of the main experiment for the follow-up survey.³² Between the main experiment and the follow-up survey, subjects completed an average of 15 other studies. At the end of our survey, we asked subjects to indicate the number of similar studies they had completed in the past two weeks. Overall, 82% of subjects answered with “none,” indicating that we successfully created a survey that was perceived being distinct from the main study.³³ Furthermore, not a single subject of the follow-up referenced our main experiment when asked “If you had to guess, what would you say was the purpose of this study?”. It thus appears that our obfuscation measures were successful in creating a survey that subjects perceive as distinct from the main experiment.

Results. We find that subjects who received information that stockholders donated more for a good cause are significantly more willing to consider investing in the future ($p = 0.020$, Wilcoxon rank-

³²We see no evidence of selection effects. Whether subjects participated in the follow-up or not was not correlated with whether they received positive or negative information about stockholders ($r = -0.02, p = 0.65$), the magnitude of the signal ($r = 0.01, p = 0.78$) or prior beliefs ($r = -0.06, p = 0.17$). Demographics were similarly balanced.

³³Our results are similar if we only consider these subjects in the analysis.

sum test) compared to those that received the information that non-stockholders donated more or the same amount. They also view non-stockholders significantly more selfish compared to stockholders ($p = 0.005$, Wilcoxon rank-sum test). We find slightly weaker but still persistent and significant effects when using the continuous signal variable instead of the binary. As placebo check, we also assess the influence of the information on the other non-stock market related variables of the survey. Reassuringly, we generally find no systematic effect of the information on intentions and perceptions of other traits and groups. We show the details of these results in Appendix G.

Key Result 4. *In line with Prediction 2, exogenously improving people's views of stockholders increases their likelihood to choose options associated with the stock market and intentions to participate in the stock market. Hence, negative views about stockholders have a causal effect on stock aversion behavior.*

4.3 Relevance of experimental investment decisions for real-world behavior

Our framing and information experiment allow for the clean identification of the effect of views about stockholders on investment behavior by designing a decision situation that allows for exogenous variation in perceptions and abstracts from confounding factors. However, this process necessarily reduces the realism of the investment decisions used in the experiments. Next, we examine the relevance of our experimental investment decision for real-world investment behavior.

Predicting real-world outcomes. First, we test whether our experimental measure predicts relevant real-world behavior and attitudes. For a valid measure, we would expect a tight association with actual investment decisions and intentions. Indeed, we find that the stock investment decisions in the experiment significantly predict (i) whether subjects currently participate in the stock market (see Appendix Table E.1), and (ii) among non-stockholders, subject's intention to participate in the stock market in the future (see Appendix Table E.2). For further details, see Appendix Section E.

Replicating real-world associations. A more demanding test is whether we can replicate the association between negative views and stock market participation observed in the field (Section 3) when we replace participation with our experimental measure. Specifically, we compare the OLS coefficient of negative views when using (self-reported) stock market participation as the dependent

variable with the coefficient obtained when using incentivized investment decisions from our experiment as dependent variable. When using stock market participation, we obtain a coefficient of -0.069 ($p < 0.001$) in our cross-country US survey, and a coefficient of -0.058 ($p = 0.011$) in our Prolific US sample (controlling for demographic variables). When using our experimental investment decisions, we consider two measures as dependent variables. For a binary variable equal to one if a subject in the experiment chooses the stock option instead of the safe option at least once, we obtain an OLS coefficient of -0.056 ($p = 0.002$). When we treat each choice between the stock and safe option as a separate observation, the OLS coefficient is -0.043 ($p = 0.003$). For details on the regressions, see Appendix Table B.7. Accordingly, the OLS coefficients are not only statistically significant across all specifications, but also remarkably similar in magnitude across outcome measures. That is, our experimental setting not only qualitatively but also quantitatively recovers the association we find in the field.

Taken together, these findings suggest that investment behavior in the experiment indeed captures relevant variation that is informative of behavior outside of the experiment.

5 Mechanism and origins of perceptions of stockholders

As third and last analyses step, this section first presents evidence on the role of identity as the mechanism behind the link between perceptions about stockholders and behavior, which we documented in the previous sections. We then investigate the origins of people's negative views of stockholders and test the idea that they emerge from stereotypical beliefs about stockholders, applying insights from the stereotypes model of Bordalo et al. (2016).

Data. We use data from the second LISS panel survey (see Section 3), which we fielded to 1,594 non-stockholders. The survey contained several measures that allow us to assess the identity mechanism and the origins of perceptions, which we will explain in the respective sections.

5.1 Identity as mechanism

Our conceptual framework of Section 2 provides an explanation for why perceptions influence behavior: people have identity concerns. Choosing an option that is associated with a negatively viewed group creates an identity conflict, which people seek to avoid. To shed light on the relevance of identity, we use two variables commonly used in the literature to reveal identity concerns: (i) an identity scale adapted to the stock market context, capturing whether subjects themselves consider the context identity-relevant (such scales are widely used in psychology, for an overview see e.g., Burke and Stets (2009), for an application in economics, see e.g., Klor and Shayo (2010)). (ii) an ingroup versus outgroup allocation game revealing whether subjects display ingroup favoritism, a key behavioral consequence of identity concerns (Shayo, 2020). Conceptually, we see both as proxies capturing $\theta \hat{\mathbb{E}}_i [\bar{q} | g(a)]$, i.e., the identity concern arises from the combination of (i) caring about identity-relevant characteristics and (ii) perceiving differences between the groups of stockholders and non-stockholders.

Identity scale. To capture stated identity concerns, we adapted five items from the established identity scales of Doosje et al. (1995) and Klor and Shayo (2010) to the stock market context. For details on the items, see Appendix J.5. Responses show a good degree of internal consistency, with Cronbach's $\alpha = 0.74$. Importantly, we find that a substantial share of subjects agrees with the statements of the scale, revealing identity concerns. For instance, 50% agree that "Not having risky financial investments is an important part of my identity" and 41% agree that they are "proud to not own risky financial investments."

Allocation decision. Following Chen and Li (2009), Enke et al. (2022) and related work, we measure ingroup favoritism using an ingroup versus outgroup allocation decision. We endow subjects with 100€, which they can freely distribute between two other participants. One participant is a stockholder, the other a non-stockholder, and we inform subjects that both have a similar amount of income and wealth.³⁴ The decision was incentivized, as for one randomly selected subject, the allocation decision was implemented with real consequences. We observe substantial ingroup favoritism in

³⁴Since stockholders are, on average, wealthier than non-stockholders, this feature allows us to abstract from animosities towards individuals of higher status.

Table 4: The association of group identification and ingroup favoritism with negative views about stockholders

	Dependent variable:			
	Identification with group of non-stockholders		Money allocated to non-stockholder	
	(1)	(2)	(3)	(4)
Negative views about stockholders	0.150*** (0.025)	0.140*** (0.024)	0.103*** (0.027)	0.086*** (0.026)
Moral universalism				-0.132*** (0.033)
Demographic controls		X		X
Observations	1,594	1,594	1,594	1,594
R ²	0.022	0.143	0.011	0.063

Notes: The table displays OLS estimates. The dependent variable in columns (1) and (2) indicates the strength of identification with the group of non-stockholders. In columns (3) and (4), the dependent variable indicates how much money is allocated to non-stockholders instead of stockholders in an allocation game. "Negative views about stockholders" is defined in section 3.1.1 and has been standardized. "Moral universalism" measures general ingroup favoritism towards other groups, with higher values indicating less favoritism. Robust standard errors in parentheses. Demographic controls include age, gender, education, income, and total financial assets. Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

our sample of non-stockholders: subjects allocate, on average, 67.23€ out of the 100€ endowment to the recipient not holding stocks, i.e., twice as much compared to the stock-holding recipient. This degree of favoritism is even significantly stronger ($p < 0.001$, paired t-test) than subjects' favoritism towards individuals of their own nationality (versus individuals living anywhere in the world). Here, subjects allocate, on average, 62.08€ to their ingroup.

Relating identity concerns to views. Table 4 shows that people's negative views about stockholders are significantly associated with responses to the identity scale and ingroup favoritism. In Column (1), we regress the degree of group identification on negative views. We find a strong and significant correlation that remains after controlling for demographic variables in Column (2). Column (3) reveals that views about stockholders also significantly predict subjects' ingroup favoritism towards non-stockholders. An increase in negative views by one standard deviation is associated with an 0.1 standard deviation increase in ingroup favoritism towards non-stockholders. Furthermore, Column (4) shows that the relation remains largely unchanged when we control for several demographic variables and, in particular, general ingroup favoritism towards other groups (measured using the Moral Universalism short-scale by Enke et al., 2022). That is, even comparing subjects who show similar

degrees of general ingroup favoritism, we find a strong relationship between negative views and allocations favoring non-stockholders. Accordingly, subjects who strongly identify with their status as non-stockholders and display ingroup favoritism are also significantly more likely to hold negative views about stockholders.

Relating identity concerns to behavior. We next examine whether identity concerns predict investment behavior and intentions among non-stockholders. Our second LISS panel survey contains three such measures: (i) an incentivized investment choice where subjects were endowed with 100 €, which they could allocate between a savings account paying no interest (safe option) and an ETF tracking the Amsterdam Exchange Index (stock option).³⁵ (ii) a measure of short-run investment intentions, where subjects state their subjective likelihood (0-100%) that they will start investing in the stock market in the next six months. (iii) a measure of long-run investment intentions, where subjects state their intentions to invest in the stock market in the next five years using a 7-point Likert scale. We find that both identity scale responses and ingroup favoritism significantly predict all three investment measures. That is, those non-stockholders who strongly identify with their status as non-stockholders and display ingroup favoritism are less likely to invest in the ETF when given the opportunity and report lower intentions to invest in the stock market in the future. For details, see Appendix Table B.8.

Key Result 5. *A substantial share of subjects regard not being a stockholder as an important part of their identity. Similarly, ingroup favoritism toward non-stockholders is widespread. Negative views significantly predict the extent of identification and ingroup favoritism, both of which, in turn, significantly predict investment behavior and future intentions to participate in the stock market.*

5.2 Origins and accuracy of perceptions of stockholders

As starting point in examining the origin of negative perceptions of stockholders, we investigate whether they are based on accurate or stereotypical beliefs, i.e., correct or overly negative representations of reality. To assess their accuracy, we need to compare actual differences between stockholders

³⁵A randomly selected subset of 16 subjects had their decisions implemented with real consequences. Their money was invested in the savings account and/or the ETF for a year and paid out afterward.

Table 5: Comparison of average actual and predicted differences

	Greed	Gambler	Selfishness
Panel A: Actual average self-assessment			
Stockholders	3.71	3.38	2.91
Non-stockholders	2.54	2.10	2.05
Difference	1.17	1.29	0.86
Panel B: Predicted average self-assessment			
Stockholders	4.27	5.22	3.47
Non-stockholders	2.70	2.40	2.53
Difference	1.57	2.82	0.94
Panel C: Exaggeration (Predicted / Actual)			
Exaggeration of difference (%)	34.8%	119.3%	9.4%

Notes: Panel A displays the average response of subjects in the LISS panel when asked to self-assess themselves regarding the characteristics greedy, gambler and selfish (agreement to "I'm kind of [...]", 0-10 Likert scale). Panel B displays the average prediction of subjects over these self-assessments. Panel C displays the ratio of predicted differences between stockholders and non-stockholders and actual differences.

and non-stockholders with subjects' predictions over these differences.

Actual differences. We measure actual differences by asking subjects in the LISS panel to rate themselves with respect to the selected traits greed, being gambler, and selfishness (agreement to "I'm kind of greedy/a gambler/selfish" 0-10 Likert scale). Comparing the answers of stockholders and non-stockholders gives us a direct measure of the differences in self-assessments. We indeed find differences between the two groups, as displayed in Panel A of Table 5. Stockholders rate themselves on average as being significantly more greedy, selfish, and as gamblers compared to non-stockholders ($p < 0.001$, Wilcoxon rank-sum test).

Predicted differences. We measure predicted differences by asking subjects to guess how stockholders and non-stockholders rate themselves on average for each of the three character traits. By comparing actual with predicted differences, we can thus test whether subjects have biased perceptions.³⁶ Panel B of Table 5 shows the results. While subjects are, on average, quite close to the true average for non-stockholders, they systematically overestimate the answers of stockholders ($p < 0.001$, Wilcoxon rank-sum test). Hence, actual differences are significantly exaggerated, ranging from 9%

³⁶This clean comparison would be impossible with our views about stockholders measure, as it concerns subjects' subjective opinions of stockholders and non-stockholders, for which no objective truth exists. Empirically, negative views about stockholders and predictions about response behavior are strongly correlated ($r = 0.42$).

for selfishness to nearly 120% for gambler-like (Panel C). Thus, subjects in our representative Dutch sample incorrectly believe that stockholders assess themselves more negatively than they actually do.

Formation of stereotypes. How do the documented stereotypical representations of reality emerge? The stereotypes model of Bordalo et al. (2016) provides a potential explanation. In the model, the formation of stereotypes is linked to the representativeness heuristic by Tversky and Kahneman (1983). When assessing groups, people base their judgment on attributes that are diagnostic and thus representative of a group. Applied to our context, negative perceptions of stockholders emerge because stockholders are *relatively* more likely among very greedy (and selfish and gambler, respectively) individuals. Subjects then perceive individuals holding stocks to be strongly representative of greedy individuals, leading them to (vastly) overestimate the existing group differences.

We indeed find evidence for the explanation proposed by the stereotypes model. While average differences are quite small, we find them to be substantially more pronounced in the tails of the distribution. Stockholders are twice as likely to rate themselves as very greedy, gambler-like, and selfish (7-10 on the 10-point scale) compared to non-stockholders (see Panel A of Appendix Table B.9). At the same time, there is almost no difference between the groups among the moderately greedy, gambler-like, and selfish (1-3 on the 10-point scale) subjects.

Validation. In order to show that the previous results extend beyond self-assessments, we employ a behavioral measure with US participants on Prolific. We ask stockholders and non-stockholders to allocate 100\$ between themselves and a charity ($N = 272$, sample used to generate information for the information experiment of Section 4.2) and a separate sample to predict the resulting difference in donation behavior between the two groups ($N = 652$, information experiment full sample). We find that stockholders donate, on average, 6 percentage points less compared to non-stockholders. These differences are again concentrated in the tails. While both groups do not differ in their likelihood of taking between 51\$ and 99\$ for themselves, stockholders are over 75% more likely to allocate the entire endowment to themselves (see Panel B of Appendix Table B.9). In line with the stereotypes model, we find a large exaggeration of the true difference. On average, subjects believe stockholders donate 15 percentage points less, more than twice the actual difference.

Correcting stereotypical perceptions. Since perceptions of stockholders are overly negative, can they be debiased through information? To test this, we informed a randomly selected half of participants in the second LISS panel survey about the actual differences in self-assessments for the traits greed, being a gambler, and selfishness. The other half received no new information. We find that subjects with biased prior perceptions hold less biased perceptions after receiving this information and subjects with approximately correct prior perceptions do not change their perceptions. Moreover, subjects in the former group are now significantly more likely to invest in an ETF in an incentivized investment choice compared to subjects in the control group with similar prior perceptions, while the investment behavior of the latter group does not significantly differ. See Appendix H for details on the experiment and results.

We conclude the section on the accuracy and origins of people's perceptions of stockholders by summarizing the results as follows:

Key Result 6. *People systematically overestimate differences between stockholders and non-stockholders. Actual differences are especially pronounced in the tails of the distribution, which suggests an origin of people's stereotypical perceptions following the stereotypes model of Bordalo et al. (2016).*

6 Conclusion

This paper proposes that people's views of stockholders matter for their investment decisions. Using a series of surveys, we document that a large fraction of individuals perceives stockholders negatively on identity-relevant characteristics. Linked survey-administrative data reveal that negative perceptions are an important predictor of actual stock market participation. We then show experimentally that negative perceptions of stockholders causally influence people's decision-making and provide evidence supporting identity concerns as the underlying mechanism.

On the one hand, our results highlight limitations to the persuasive power of outcome-based strategies to influence households' financial decisions and offer perspectives on designing potentially more effective strategies. The strong aversion towards stock-related options found in our experiments suggests that classic strategies, such as highlighting potential gains from investing or improving knowl-

edge, might have limited effects on strongly identity-minded households. Similarly, interventions or advertisements that appeal to the skills of financial experts may not convince such households to invest in stocks. Identity concerns may also help explain how misperceptions about the stock market persist in the presence of feedback and educational opportunities. For instance, Duraj et al. (2025) show misperceptions about factors such as entry costs and the effort and time required to invest are widespread. Identity concerns may act as barriers preventing non-participants from informing themselves or updating from feedback.

On the other hand, our results suggest that interventions aimed at decreasing negative perceptions of stockholders have the potential to substantially influence behavior. We show that a relatively light-touch intervention – providing subjects with information about differences between stockholders and non-stockholders – significantly affects decision-making in our experiment. Broader interventions, such as providing detailed information about differences over a longer period, could thus induce changes in households' stock market participation.

Since we document that a substantial fraction of people hold stereotypical and thus biased beliefs regarding stockholders, normative arguments in favor of such interventions can be made. This is an important factor in distinguishing our explanation from preference-based explanations. Not only are deeply held preferences difficult or even impossible to change, but it is also normatively questionable whether any attempt at change through interventions should be made at all. In contrast, our results indicate that perceptions of stockholders are malleable and frequently incorrect, providing a larger normative scope for behavioral change. However, the presence of identity concerns complicates a straightforward welfare assessment. We view disentangling the welfare effects of changing perceptions when one's identity depends on perceptions as an exciting avenue for future research.

Another potentially interesting avenue stems from our observation that people's views of stockholders vary substantially across countries. For instance, stockholders are viewed less negatively in the US than in Germany on average. Likewise, the association of views and participation decisions differs across countries. Building on the recent literature on international comparative household finance (Badarinza et al., 2016), examining the cultural and institutional determinants of people's views of

financial decision-makers may be a fruitful avenue to further understand cross-country differences in financial decisions.

We conclude by highlighting that our framework and methodology are not tied to financial decision-making. It can readily be applied more generally to other economic contexts in which strong aversion behavior appears to be at odds with outcome- or constraint-based explanations. For instance, our mechanism could help to explain the widespread non-take-up of social transfers (Currie, 2006). Similarly, significant fractions of people abstain from holding debt and avoid insurance markets (Guiso and Sodini, 2013). Since people naturally form perceptions over groups defined by economic decisions, our channel has the potential to significantly influence decision-making and particularly aversion behavior in these domains.

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Internet Appendix

A Additional figures

Figure A.1: Combinations of risky option visualization (Draw Framing)

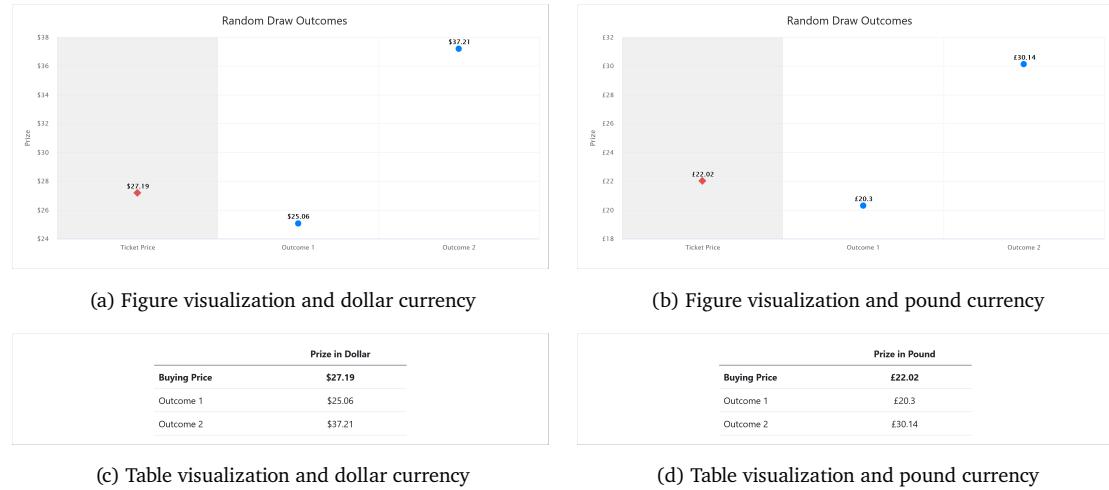
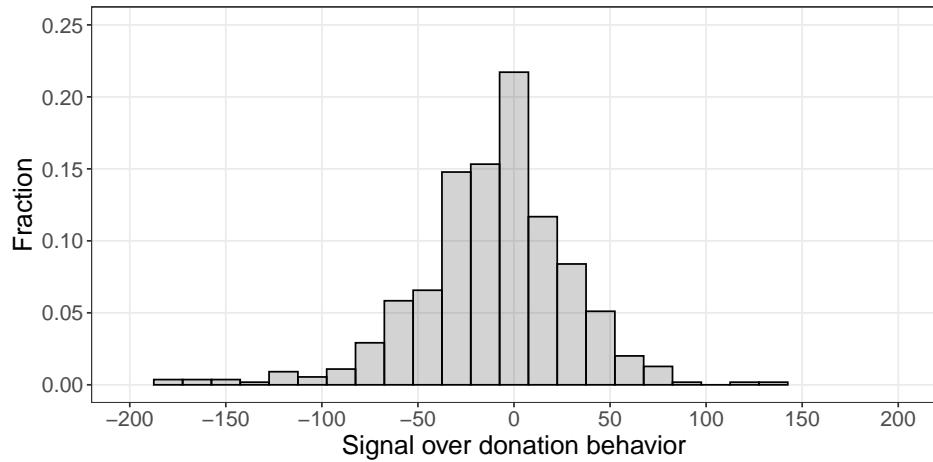
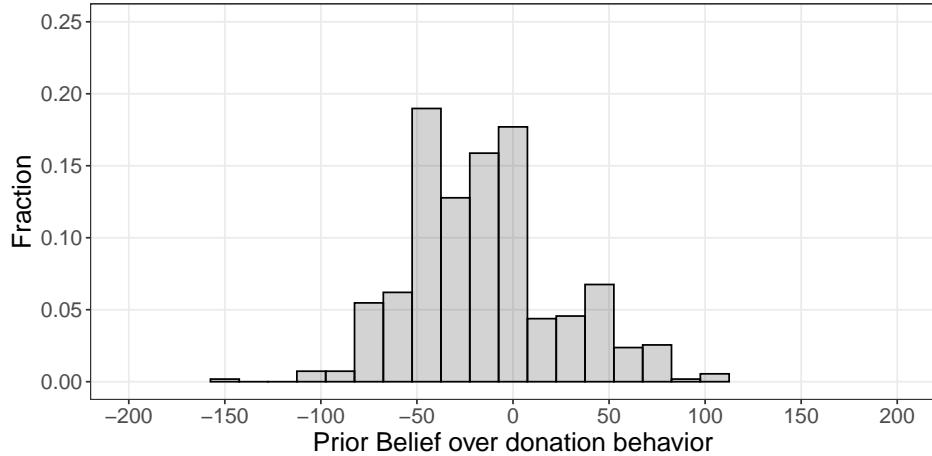


Figure A.2: Distribution of signals generated in the information experiment



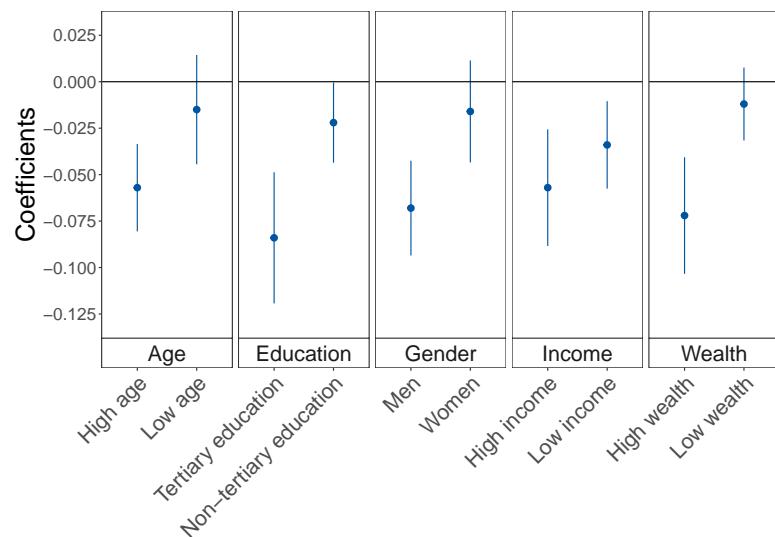
Notes: This figure displays the distribution of signals subjects received in the information experiment over the difference in donation behavior between stockholder and non-stockholder. Higher values indicate signals that stockholder donated more relative to non-stockholder.

Figure A.3: Distribution of prior beliefs in the information experiment



Notes: This figure displays the distribution of subjects' prior beliefs over the difference in donation behavior between stockholder and non-stockholder in the information experiment. Higher values indicate subject's beliefs that stockholders donate more relative to non-stockholders.

Figure A.4: Heterogeneity in the relationship between negative views and stock market participation



Notes: This figure displays coefficients of interaction terms from a series of OLS regressions. Each regression includes dummy variables for all demographic characteristics (including median splits for age, income, and wealth), the behavioral determinants from column (3) of Table 1, and interactions between negative views about stockholders and with a dummy variable and the respective complementary group. For example, in the left panel, we include interactions of negative views with both a high-age and a low-age dummy variable.

B Additional tables

Table B.1: The association of demographic variables with negative views about stockholders

	<i>Dependent variable:</i> Negative views about stockholders
	(1)
Female	0.083** (0.038)
Age	0.004*** (0.001)
Education: upper secondary	-0.006 (0.058)
Education: tertiary	-0.055 (0.058)
Income 2nd tercile	0.071 (0.051)
Income 3rd tercile	0.004 (0.052)
Wealth 2nd tercile	0.045 (0.049)
Wealth 3rd tercile	-0.054 (0.055)
Observations	2903
<i>R</i> ²	0.008

Notes: The table shows coefficients of an OLS regression. The dependent variable is “Negative views about stockholders” as defined in section 3.1.1. Robust standard errors in parentheses. Significance levels: *p<0.1; **p<0.05; ***p<0.01.

Table B.2: Cross-country association of views about stockholders with stock market participation

Dependent variable: Participates in the stock market						
	All countries (1)	Australia (2)	Germany (3)	Italy (4)	Japan (5)	Mexico (6)
Negative views about stockholders	-0.069*** (0.006)	-0.089*** (0.017)	-0.112*** (0.017)	-0.103*** (0.016)	-0.004 (0.024)	-0.028* (0.015)
Observations	5,130	502	499	500	513	511

Dependent variable: Participates in the stock market					
	South Korea (7)	Spain (8)	Sweden (9)	United Kingdom (10)	United States (11)
Negative views about stockholders	-0.069*** (0.022)	-0.063*** (0.018)	-0.050* (0.026)	-0.062*** (0.019)	-0.069*** (0.018)
Observations	510	498	508	525	564

Notes: The table shows OLS regression coefficients. The dependent variable equals one if the subject reports to own stocks and zero otherwise. “Negative views about stockholders” is defined in section 3.1.1 and standardized. Robust standard errors in parentheses. The regression further includes as control variables subjects’ age and gender as well as country fixed effects in column (1). Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table B.3: Subsample balancing test

	Any determinant missing (1)	Subsample (2)	$H_0 : (1) = (2)$
			p-value (3)
Age	51.18	61.41	0.00
Female	0.56	0.45	0.00
Education: upper secondary	0.34	0.33	0.59
Education: tertiary	0.46	0.42	0.06
Negative views about stockholders	2.37	2.43	0.39
Income 2nd tercile	0.32	0.34	0.39
Income 3rd tercile	0.34	0.33	0.58
Wealth 2nd tercile	0.33	0.33	0.97
Wealth 3rd tercile	0.28	0.39	0.00
Has risky financial assets	0.22	0.24	0.31
Observations	1493	1410	

Notes: Column (1) displays mean values of variables of subjects for which any of the determinant variables displayed in Table 1 is missing. Column (2) does the same for the subsample for which we have detailed behavioral variables. The last column shows p-values obtained using Wilcoxon rank-sum tests comparing the means of the two samples.

Table B.4: Balance tests

Variable	Not linked to admin data	Linked to admin data	$H_0 : (1) = (2)$
	(1)	(2)	(3)
Age	56.15	56.15	0.86
Female	0.56	0.51	0.12
Education: upper secondary	0.33	0.34	0.88
Education: tertiary	0.44	0.44	0.96
Negative views about stockholders	2.31	2.40	0.29
Observations	365	2903	

Variable	Treatment	Treatment	$H_0 : (1) = (2)$
	<i>Stock Framing</i> (1)	<i>Draw Framing</i> (2)	p-value (3)
Age	35.52	35.03	0.89
Women	0.70	0.68	0.58
High income	0.53	0.48	0.23
High wealth	0.65	0.62	0.40
Is primary financial decision-maker	0.65	0.62	0.45
Has college degree	0.35	0.38	0.51

Variable	Correlation	$H_0 : r = 0$
	coefficient r (2)	p-value (3)
Prior belief	0.01	0.89
# Random draw option choices	-0.05	0.24
Age	0.03	0.46
Women	0.02	0.57
High income	-0.01	0.84
High wealth	-0.03	0.51
Is primary financial decision-maker	-0.05	0.20
Has college degree	-0.02	0.70

Notes: **Panel A:** Column (1) displays mean values of variables of subjects we could not link to administrative income and wealth data. Column (2) does the same for subjects we could link. The last column shows p-values obtained using Wilcoxon rank-sum tests comparing the means of the two samples. **Panel B:** Column (1) and (2) displays mean values of variables for both treatments of the framing experiment (Panel A) and the information experiment (Panel B). Column (3) shows p-values obtained using Wilcoxon rank-sum tests comparing the means of both treatments. **Panel C:** Column (2) displays pairwise Pearson correlation coefficients between the displayed variable and the variable indicating the signal over donation behavior that subjects received. Higher values for this variable indicate signals that stockholder donated more relative to non-stockholder. Column (3) show p-values obtained using Pearson correlation tests.

Table B.5: Framing experiment treatment effect on decision-making

Panel A: Between-subject effect		
<i>Dependent variable: Choice of risky option</i>		
	(1)	(2)
Stock framing	−0.142*** (0.032)	−0.132*** (0.032)
Constant	0.524*** (0.021)	0.600*** (0.084)
Demographic controls		X
Subjects	515	509
Observations	2,060	2,036

Panel B: Within-subject effect		
<i>Dependent variable: Choice of risky option</i>		
	(1)	(2)
Stock framing	−0.117*** (0.016)	−0.117*** (0.016)
Constant	0.498*** (0.016)	0.583*** (0.069)
Demographic controls		X
Subjects	515	509
Observations	4,120	4,072

Notes: The table displays OLS estimates. The dependent variable is an indicator variable equal to one if the risky option is chosen and zero if the safe option is chosen. Stock description is an indicator variable equal to one if the risky option is described as a stock investment and zero if described as a random draw investment. Standard errors (in parentheses) are clustered at the subject level. Demographic controls include age, gender, education, income, total financial assets, and involvement in household decision-making. Significance levels: * p<0.1; ** p<0.05; *** p<0.01.

Table B.6: IV-regression of negative perceptions on decision-making

	<i>Dependent variable: Choice of stock option</i>	
	Selfishness (2)	Greed (1)
Negative perception over selfishness	−0.140** (0.062)	
Negative perception over greed		−0.165** (0.075)
Choice of draw option	0.234*** (0.026)	0.233*** (0.026)
F-statistic first stage	32.16	21.26
Demographic controls	X	X
Prior beliefs	X	X
Subjects	541	541
Observations	2164	2164

Notes: The table displays 2SLS-estimates. All four binary choices between the risky option described as a stock investment and the safe option of a subject enter as separate observations. The dependent variable is an indicator whether the risky option described as a stock investment is chosen. The instrument is the signal received regarding the difference in donation behavior between stockholders and non-stockholders (see Table 3 for the first stage results). The instrumented variable is in column (1) “Perceptions about stockholders’ selfishness” and in (2) “Perceptions about stockholders’ greed.” Both denote standardized differences in ratings between stockholders and non-stockholders, with higher values indicating that stockholders are rated as more selfish (1) and more greedy (2). “Choice of draw option” is an indicator whether the risky option is chosen when described as a random draw investment. “Prior beliefs” is subjects’ belief over the difference in donation behavior between stockholders and non-stockholders. Demographic controls include age, gender, education, income, total financial assets, and involvement in household decision-making. Standard errors (in parentheses) are clustered at the subject level. Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table B.7: The relationship between negative views about stockholders and financial decisions in survey and experiment

	Dependent variable:							
	Participates in the stock market (cross-country US survey)		Participates in the stock market (Prolific US survey)		Invests at least once (experiment)		Choice of stock option (experiment)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Negative views about stockholders	-0.073*** (0.017)	-0.069*** (0.018)	-0.057** (0.023)	-0.058** (0.023)	-0.061*** (0.017)	-0.056*** (0.018)	-0.054*** (0.014)	-0.043*** (0.014)
Constant	0.408*** (0.021)		0.195*** (0.024)		0.724*** (0.017)		0.479*** (0.015)	
Dem. controls		X		X		X		X
Subjects	564	564	272	269	652	644	652	644
Observations	564	564	272	269	652	644	2,608	2,576

Notes: The table displays OLS-estimates. The dependent variable in columns (1)-(4) equals one if the subject reports to own stocks and zero otherwise, in columns (1) and (2) for the US sample of the cross-country survey (see Section 3) and in columns (3) and (4) for the Prolific US survey that was used to generate the information for the experiment (see Appendix D.2). The dependent variable in columns (5) and (6) equals one if the subject chooses the risky option described as stock investment at least once across all four decisions in the information experiment (Section 4.2). In columns (7) and (8), we add all respective four choices of this experiment as separate observations and the dependent variable equals one if the risky option is chosen. "Negative views about stockholders" is defined in Section 3.1.1 and standardized. Standard errors (in parentheses) are clustered at the subject level. Dem. controls include age and gender in columns (1) and (2) and age, gender, education, income, total financial assets, and involvement in household decision-making in columns (3)-(8). Significance levels: * p<0.1; ** p<0.05; *** p<0.01.

Table B.8: The association of group identification and ingroup favoritism with investment behavior and intentions

Panel A	Dependent variable:					
	Money invested in ETF		Short-run investment intentions		Long-run investment intentions	
	(1)	(2)	(3)	(4)	(5)	(6)
Identification with group of non-stockholders	-11.566*** (0.916)	-10.002*** (0.982)	-3.318*** (0.596)	-2.578*** (0.611)	-0.660*** (0.049)	-0.492*** (0.050)
Demographic controls		X		X		X
Observations	1,594	1,594	1,594	1,594	1,594	1,594
R ²	0.095	0.134	0.021	0.054	0.118	0.213

Panel B	Dependent variable:					
	Money invested in ETF		Short-run investment intentions		Long-run investment intentions	
	(1)	(2)	(3)	(4)	(5)	(6)
Money allocated to non-stockholders	-7.097*** (0.994)	-6.836*** (0.976)	-5.447*** (0.597)	-5.045*** (0.624)	-0.564*** (0.048)	-0.487*** (0.047)
Demographic controls		X		X		X
Observations	1,594	1,594	1,594	1,594	1,594	1,594
R ²	0.036	0.106	0.057	0.089	0.086	0.217

Notes: The table displays OLS estimates. The dependent variable in columns (1)-(2) is the amount (out of 100) that subjects allocate to an ETF instead of a savings account in an incentivized investment decision, in columns (3)-4), it is subjects' self-assessed likelihood (0-100%) that they will start investing in the stock market in the next six months, and in columns (5)-(6), it is subjects' stated intention to invest in the next five years (7-point Likert scale). "Identification with group of non-stockholders" indicates the strength of identification with the group of non-stockholders. "Money allocated to non-stockholder" indicates how much money is allocated to non-stockholders instead of stockholders in a bystander allocation game. All independent variables displayed have been standardized. Robust standard errors in parentheses. Demographic controls include age, gender, education, income, and total financial assets. Significance levels: * p<0.1; ** p<0.05; *** p<0.01.

Table B.9: Distribution of self-assessments and allocations

Panel A: Netherlands		Self-assessed greed (0-10 point scale)			
		0	1-3	4-6	7-10
Stockholder		14.7%	35.7%	31.6%	17.9%
Non-stockholder		32.7%	35.6%	22.8%	9%
Self-assessed gambler (0-10 point scale)					
		0	1-3	4-6	7-10
Stockholder		14.7%	41.5%	30.3%	13.4%
Non-stockholder		37%	38.7%	18.3%	6.1%
Self-assessed selfishness (0-10 point scale)					
		0	1-3	4-6	7-10
Stockholder		16.6%	48.1%	26.8%	8.5%
Non-stockholder		35.6%	40.6%	19.7%	4.1%
Panel B: United States		Amount allocated to self (\$0 - \$100)			
		0-49	50	51-99	100
Stockholder		17.0%	24.5%	35.8%	22.6%
Non-stockholder		19.6%	30.6%	37%	12.8%

Notes: Panel A shows the distribution of subjects' self-assessment over the character traits greed, being a gambler, and selfishness. We display the proportions of subjects rating themselves as 0, 1-3, 4-6, or 7-10 for the respective trait separately for the group of stockholders and non-stockholders. Panel B shows in a similar fashion the distribution of money allocated by subjects to themselves (out of \$100) instead of a charity in an allocation game.

C Selection of character traits

This section describes the pilot experiment that we used to select three character traits for our measure capturing perceptions of stockholders. As explained in Section 3.1.1, we used two criteria to select the traits: the traits need to be associated with stockholders and identity-relevant to subjects. To identify suitable candidates, we conducted an unstructured, data-driven search across a wide range of sources, including news articles, books, and movies discussing stockholders and the stock market, as well as the psychology literature on commonly studied personality traits. This process allowed us to identify characteristics that both appear in public discourse on stock market participants and are frequently analyzed in psychology. From this broader set, we compiled a list and selected the eight most plausible candidates. For each of these, we adapted a description from established psychological definitions. In addition, we added two further characteristics (non-religiousness and non-athleticness) for which we did not expect any association with stockholders, serving as a validity check. Table C.1 displays all ten characteristics together with their respective definitions.

Table C.1: List of character traits used for selection

Variable	Definition
Aggressiveness	The tendency towards social dominance, threatening behavior, and hostility.
Arrogance	The tendency to show an attitude of overbearing superiority or make presumptuous claims or assumptions.
Dishonesty	The tendency to lack truthfulness, uprightness, and integrity.
Gambler	A person who shows the tendency to risk money or other stakes in the hope of being successful.
Greed	The tendency to continuously want more of things like wealth, possessions or social values.
Impatience	The tendency to be restless or short of temper, especially under irritation, delay, or opposition
Impulsiveness	The tendency to act hastily and without adequate reflection on the possible consequences.
Selfishness	The tendency to accept negative consequences for other people or the environment to gain a personal advantage as a result.
Non-athleticness	A person who lacks agility, muscular strength, or broad-shouldered physique.
Non-religiousness	The tendency to not have a religious character or not relate to or believe in a religion.

We presented this list (in randomized order) and the accompanying definitions to 194 subjects in a Dutch online panel supplied by the provider Pureprofile. In order to check the first condition, subjects were asked to rank the traits according to how strongly they associate the traits with stockholders. We used the same definition for stockholders as employed throughout the paper. Using subjects' rankings,

we computed for each trait the average rank, with one being ranked highest (most strongly associated) and ten the lowest rank. Panel A of Table C.2 displays the results. We observe that people perceive the trait greed to be most strongly associated with stockholders, followed by being a gambler and selfishness. All three traits differ significantly from the random benchmark ($p < 0.001$, Wilcoxon rank-sum test). Reassuringly, we find that the characteristics non-athletic and non-religious are ranked last, indicating that subjects answered deliberately.

To test the second condition, we asked subjects to state for each trait how “important it is for you that you do not appear to have this characteristic and that others do not see you as such a person.” Subjects could rate the traits using a scale from one (“not at all important”) to ten (“very important”). As displayed in Panel B of Table C.2, the previously highest-ranked traits greed, being a gambler, and selfishness are also among the four highest-rated traits with respect to their identity relevance. Based on these results, we chose the three character traits greed, being a gambler, and selfishness as our leading variables used to measure perceptions of stockholders. Because subjects indicate that it is important to them that they do not appear to have the three selected traits, these traits are considered negatively by subjects.

Table C.2: Trait evaluations: stockholder rank and identity relevance

Panel A: Association with stockholders		Panel B: Identity relevance	
Characteristic	Avg. Rank	Characteristic	Importance
Greed	3.85	Gambler	6.34
Gambler	4.31	Greedy	5.90
Selfishness	4.83	Impulsiveness	5.68
Arrogance	4.84	Selfishness	5.65
Impulsiveness	5.02	Aggressiveness	5.53
Impatience	5.51	Arrogance	5.30
Aggressiveness	5.89	Impatience	4.77
Dishonesty	6.48	Dishonesty	4.49
Non-athleticness	6.70	Non-athleticness	4.47
Non-religiousness	7.58	Non-religiousness	3.35

Notes: Panel A shows the average rank of characteristics associated with stockholders; lower values indicate stronger association. Panel B shows self-reported identity relevance; higher values indicate greater importance to one’s identity.

D Further evidence on negative views about stockholders

This section describes in more detail in D.1 the additional survey that we used as robustness exercise for the main result presented in Section 3. In Subsection D.2, we provide evidence that negative views about stockholders are also prevalent among Prolific participants.

D.1 Robustness of negative views about stockholders

Design. Overall, we collected data from 1,016 subjects who are broadly representative of the Dutch population in terms of age and gender provided by Panel Inzicht. After answering a couple of demographic questions, subjects were presented with a list of activities. The activities were selected to be related to the three character traits selfishness, being a gambler and greed. For each activity, subjects were asked to estimate the proportion of people engaging in the activity. Subjects could enter any percentage number from 0 to 100 as answer and were asked separately about stockholders and non-stockholders. In order to avoid overloading subjects with too many activities, we varied between subjects some of the activities. Table D.1 displays the set of activities used together with the respective number of observations and formulations of the survey questions.

Table D.1: List of activities used for robustness

Variable	Related trait	Observations	Survey question Out of [GROUP], how many stated that they...
Voluntary work	Selfishness	1,016	...currently do voluntary work or did so in the past two years?
Donating money	Selfishness	670	...donated money to a good cause in the past two years?
Helping strangers	Selfishness	346	...helped a stranger in need at some point in the past two years?
Casino loss	Gambler	1,016	...lost money in a casino at least once?
Excessive risk	Gambler	346	...at least once been in a situation where they regretted that they took too much risk?
Unnecessary buying	Greed	1,016	...at least once bought a product which they didn't really need just for the sake of having it?
Dissatisfaction	Greed	1,016	...felt dissatisfied because they wanted to possess more things at some point during the past two years?

Additionally, we described a dictator game to a subset of 346 subjects. We told them that survey

participants are provided an endowment of five euros. The participants can allocate the endowment between themselves and the charitable organization Artsen zonder Grenzen (Doctors Without Borders). A randomly selected subset gets their decision implemented with real consequences. Similar to the elicitation of the activities, we ask subjects to estimate how these participants allocate the money. Specifically, they were asked to estimate the average amount donated to the charity as percentage of the endowment (0-100%). Subjects make their guess separately for the group of stockholders and non-stockholders.

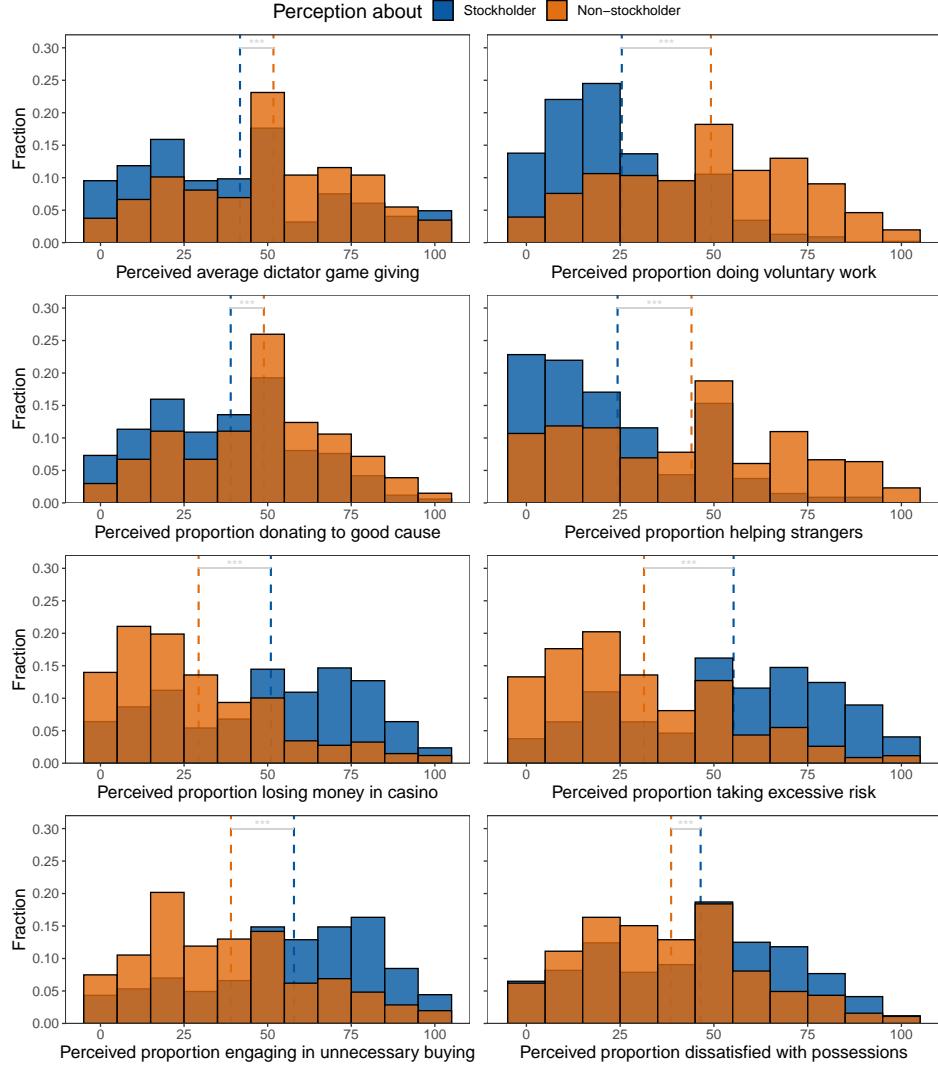
Finally, we wanted to replicate our finding of negative perceptions over the three selected character traits presented in the main text for the LISS panel also for this sample. Accordingly, after eliciting subjects' estimates regarding the activities and dictator game, we included the standard module that elicits perceptions of the character traits greed, being a gambler, and selfishness, as described in Section 3.

Results. We replicate the finding of large negative perceptions of stockholders with respect to character traits also in this sample. The distribution of ratings for stockholders again lie to the right of the non-stockholder distribution in all three cases ($p < 0.001$, Kolmogorov-Smirnov test). At the individual level, we again observe that a majority views stockholders as strictly more greedy, gambler-like and selfish, with 80% holding strictly negative views about stockholders.

Figure D.1 shows the results for the dictator game and activities. In all nine cases, the distributions of perceptions differ significantly between stockholders and non-stockholders ($p < 0.001$, Kolmogorov-Smirnov test). If the activities are positively described (dictator game, voluntary work, donating money, helping strangers), subjects predict stockholder to be significantly less likely to be engaged in the activity. If the activities are negatively described (casino loss, excessive risk, unnecessary buying, and dissatisfaction), subjects predict stockholder to be significantly more likely to be engaged in the activity. In almost all cases, the average perceived difference is larger than 10, in some cases even larger than 20 percentage points. Furthermore, in all cases does a majority of subjects view stockholder as more negative or less positive, respectively. For instance, 58% of subjects predicting stockholder to give strictly less to charity compared to non-stockholder in the dictator game and 51%

predict the fraction of stockholders that have donated money to a good cause in the past two years to be strictly lower than the fraction of non-stockholders.

Figure D.1: Perceptions of differences in activities between stockholder and non-stockholder



Notes: The figure displays the distribution of subjects' estimates of the fraction of stockholders and non-stockholders engaging in the described activities. Higher values indicate that subjects estimate a higher fraction of individuals engaging in the activity. The dotted lines display mean values. Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

D.2 Validating the existence of negative views about stockholders on Prolific

The goal in this section is to replicate the main finding of Section 3 - people view stockholders negatively - for our experimental population on Prolific. For this purpose, we ran a separate survey on Prolific to measure participants' views about stockholders.

Sample. 272 subjects on Prolific with residence in the US completed the survey. See Appendix Table J.3 for sample demographics. The median completion time was less than 5 minutes, and subjects received £0.5 ($\approx \$0.63$) for completion. We also used this sample to generate the donation behavior used for the information experiment of Section 4.2. Hence, we presented subjects with an allocation decision and afterward elicited their perceptions of stockholders as described in 3.1.1 together with demographic variables.

Results. For all three traits, we can reject the null hypothesis that both distributions are drawn from the same distribution (all $p < 0.01$, Kolmogorov-Smirnov test, Bonferroni corrected). At the individual level, 55% of subjects view stockholders as strictly more greedy, 88% view them as strictly more as gamblers, and 46% strictly more selfish. On average, 83% of subjects view stockholders strictly more negative than non-stockholders. Hence, we replicate the existence of negative views about stockholders among respondents on Prolific.

E Validation of experimental measures

Our framing and information experiments use an incentivized investment decision as key outcome. Specifically, we vary the association of the risky option with the stock market by describing the option as either a stock investment or an investment in a random draw. This raises the question of how informative this decision is for real-world investment behavior.

The experimental stock investment decision differs in two important aspects from real stock investments. First, we use already materialized stock prices, allowing us to control the uncertainty process generating stock price movements. This process is ambiguous in reality, i.e., generally not quantifiable by exact probabilities. However, subjects in our experiment still bet on stock price movements, making *Stock Framing* investments similar to actual stock investments, in particular more similar than respective *Draw Framing* investments. Second, subjects in our experiment do not receive fractional ownership of a company through their investment as they would in reality. Since households use stock investments mainly for wealth accumulation and not to exercise voting rights over a company, we argue that this difference also does not render *Stock Framing* investments uninformative.

In the following, we provide evidence that subjects' decisions in the experiment are informative for real-life investment behavior. We do so by first showing that it predicts stock market participation decisions among the full sample and intentions to participate in the stock market in the future among current non-stockholders.

E.1 Predicting stock market participation

Sample. To show empirically that the investment decision in *Stock Framing* is associated with stock market participation, we use the full sample of 651 subjects of the framing experiment. While the sample used for the main analysis consists solely of non-stockholders (as preregistered), the full sample also contains 136 stockholders. We thus use the full sample to compare the likelihood that the stock option is chosen among stockholders compared to non-stockholders.

Results. We regress a dummy variable indicating whether the subjects reports holding any risky financial assets on their choice between the risky option described as stock investment and the safe

Table E.1: Validation that stock option choices predicts stock market participation decisions

	<i>Dependent variable:</i>			
	Has risky financial assets			
	(1)	(2)	(3)	(4)
Choice of stock option	0.131*** (0.026)	0.114*** (0.024)	0.115*** (0.027)	0.102*** (0.025)
Choice of draw option			0.048* (0.025)	0.037 (0.023)
Constant	0.381*** (0.017)	0.444*** (0.078)	0.222*** (0.016)	0.269*** (0.075)
Demographic controls		X		X
Subjects	651	643	651	643
Observations	2,604	2,572	2,604	2,572

Notes: OLS estimates in which the dependent variable equals one if the subject self-reports to have risky financial assets. “Choice of stock option” equals one if the risky option described as stock investment is chosen and zero if the safe option is chosen. “Choice of draw option” equals one if the risky option described as random draw investment is chosen. Standard errors (in parentheses) are clustered at the subject level. Demographic controls include age, gender, education, income, total financial assets, and involvement in household decision-making. Significance levels: * $p<0.1$; ** $p<0.05$; *** $p<0.01$.

option. As Table E.1 shows, we find a significant association: The likelihood that a subject participates in the stock market is 13 percentage points higher on average when they choose the stock option. Remarkably, this effect remains strong and significant even when we control for their choices in the draw framing decisions. Accordingly, controlling for subjects’ choice behavior towards an investment with identical risk and returns outside the stock market context, stock option choices still significantly predict participation rates. This result also provides support for a relevant necessary condition of Prediction 1. For subjects to value the stock option differently, it needs to be more strongly associated with stockholders than the draw option. As we have shown, stockholders are indeed significantly more likely to choose the stock option.

E.2 Predicting investment intentions

Sample. Having shown that experimental decisions predict participation rates among all subjects, we now zoom into non-stockholders. Here, we want to examine whether experimental choices predict intentions to participate in the stock market at some point in the future. For this, we use our sample of 428 subjects that completed the follow-up survey of the information experiment (see Section 4.2.3 and

Appendix Section G). Here, subjects were asked to state on a 7-point Likert scale their agreement to the following statement: "In the next five years, I will under no circumstances or situations whatsoever invest any of my own money into financial assets traded on the stock market such as funds or shares." For the analysis, we reverse code the variable so that higher values indicate higher intentions to participate in the stock market in the future.

Results. We regress subjects stated intention to participate in the stock market on their choice between the risky option described as stock investment and the safe option. We again find a significant association, as displayed in Table E.2: a higher likelihood of stock option choices is associated with stronger intentions to participate in the stock market in the future. As with our previous analysis, this association remains similar when we control for their choices in the draw framing decisions.

Table E.2: Validation that stock option choices predicts investment intentions

	<i>Dependent variable:</i>			
	Intention to participate in the stock market			
	(1)	(2)	(3)	(4)
Choice of stock option	0.464*** (0.138)	0.485*** (0.133)	0.477*** (0.138)	0.507*** (0.133)
Choice of draw option			−0.048 (0.119)	−0.081 (0.115)
Constant	4.566*** (0.116)		4.587*** (0.127)	
Demographic controls		X		X
Subjects	428	422	428	422
Observations	1,712	1,688	1,712	1,688
R ²	0.016	0.082	0.016	0.083

Notes: The table displays OLS-estimates. The dependent variable is subjects' stated intention to invest in the stock market at some point in the next five years on a scale from 1 to 7 (collected in the information experiment follow-up survey). "Choice of stock option" equals one if the risky option described as stock investment is chosen and zero if the safe option is chosen. "Choice of draw option" is equals one if the risky option described as random draw investment is chosen (both variables were collected in the information experiment). Standard errors (in parentheses) are clustered at the subject level. Demographic controls include age, gender, education, income, total financial assets, and involvement in household decision-making. Significance levels: *p<0.1; **p<0.05; ***p<0.01.

F Further details on the experimental choices

In this section, we provide more details on the experimental choices that subjects face in the framing and information experiment conducted on Prolific.

Summary. At the beginning of the experiment, subjects made two choices between a certain amount and a binary lottery. We use these responses to calibrate the payout values of the risky options in the subsequent decision parts. Afterwards, subjects face two decision parts. Each decision part consists of four investment decisions. In each decision, subjects are endowed with \$30 and choose between a safe and a risky option. By choosing the risky option, subjects pay an amount $c < \$30$ and receive with 50% probability a high outcome $x_h > c$ and with 50% probability a low outcome $x_l < c$ as additional payment. Choosing the safe option yields the endowment as additional payment with certainty. Each choice can thus be represented by the triple $[c, x_l, x_h]$. Across the four decisions, we vary the amount c as well as the outcomes x_h and x_l . Between the decision parts, we vary the framing of the decisions, as described in more detail in the paper.

Calibration choice. In the calibration stage, subjects first face sorting question Q_1 between a safe option and a risky option. When they choose the safe option in Q_1 , they then face sorting question $Q_2^{Q_1=\text{safe}}$; if they choose the risky option, they face sorting question $Q_2^{Q_1=\text{risky}}$. The parameters of the risky option are:

$$\text{Sorting } Q_1 : \quad [c = 10, x_l = 7, x_h = 20],$$

$$\text{Sorting } Q_2^{Q_1=\text{safe}} : \quad [c = 10, x_l = 9, x_h = 26],$$

$$\text{Sorting } Q_2^{Q_1=\text{risky}} : \quad [c = 10, x_l = 4, x_h = 25].$$

Based on subjects' choices in these two binary choices, we generate a subject-specific risk score ranging from 1 (most risk averse) to 4 (least risk averse). We use this mapping to calibrate the payout values of the risky options for the investment choices. Subjects who reveal a high degree of risk averse behavior during the initial two questions receive less risky options later, which reduces the fraction of subjects who display no variation in choices by either always select the safe option or the risky option. This procedure thus increases the power of our experimental comparison. The mapping is described in

Table F.1.

Table F.1: Mapping of calibration choices to risk score

Risk Score	Choices
1	($Q_1 = \text{safe}$, $Q_2 = \text{safe}$)
2	($Q_1 = \text{safe}$, $Q_2 = \text{risky}$)
3	($Q_1 = \text{risky}$, $Q_2 = \text{safe}$)
4	($Q_1 = \text{risky}$, $Q_2 = \text{risky}$)

Investment choices. Following the elicitation, subjects face the four investment decisions. Which parameters they receive depends on their individual risk score, with the exception of the MSCI EM ETF. Higher risk scores mean that subjects face more risky outcomes in the risky option. The parameters of the decisions are displayed in Table F.2. The prices are actual end-of-the-year prices of the respective ETFs over different years. Importantly, the parameters are independent of treatments, i.e., independent of how the options are described in the framing experiment and the content of the signal in the information experiment.

Table F.2: Investment decision parameters

Name of ETF	Risk Score	Parameters
Invesco FTSE RAFI US 1000 UCITS	1	[$c = 9.37$, $x_l = 8.32$, $x_h = 36.35$]
	2	[$c = 9.37$, $x_l = 8.32$, $x_h = 27.82$]
	3	[$c = 9.37$, $x_l = 8.32$, $x_h = 22.36$]
	4	[$c = 9.37$, $x_l = 8.32$, $x_h = 17.21$]
iShares Nasdaq 100 UCITS (DE)	1	[$c = 21.15$, $x_l = 18.72$, $x_h = 62.24$]
	2	[$c = 21.15$, $x_l = 18.72$, $x_h = 48.03$]
	3	[$c = 21.15$, $x_l = 18.72$, $x_h = 46.10$]
	4	[$c = 17.69$, $x_l = 12.03$, $x_h = 42.62$]
iShares MSCI World UCITS (Dist)	1	[$c = 26.57$, $x_l = 25.10$, $x_h = 68.71$]
	2	[$c = 26.57$, $x_l = 25.10$, $x_h = 44.73$]
	3	[$c = 26.57$, $x_l = 25.10$, $x_h = 40.07$]
	4	[$c = 27.19$, $x_l = 25.06$, $x_h = 37.21$]
iShares MSCI EM UCITS (Acc)	1	[$c = 29.07$, $x_l = 28.22$, $x_h = 42.50$]
	2	[$c = 29.07$, $x_l = 28.22$, $x_h = 42.50$]
	3	[$c = 29.07$, $x_l = 28.22$, $x_h = 42.50$]
	4	[$c = 29.07$, $x_l = 28.22$, $x_h = 42.50$]

G Follow-up survey for information experiment

This section provides a detailed description of the follow-up survey we conducted after the information experiment. As explained in the main text, one of the main goals of the survey was to address experimenter demand concerns. For this purpose, we designed the survey to appear to subjects as a study unrelated to the information experiment. If subjects indeed perceive no connection between follow-up and information experiment, but we still find treatment effects in the follow-up, then experiment demand effects cannot confound them.

G.1 Survey design

We invited participants of the information experiment to our follow-up survey two days after the experiment finished. This invitation appeared on participants' messaging boards on Prolific alongside invitations to other studies. Invitations include a title, short description, and name of the responsible researcher, which we thus all varied between information experiment and follow-up survey. We described the former as a decision-making experiment with the first author as researcher and the University of Bonn as institution, and the latter as an opinion survey about general topics with the second author and IZA as researcher and institution. Once subjects accepted the invitation, they were directed to the survey, which used a different welcome page and visual style compared to the information experiment. The survey itself consisted one eliciting intentions and one eliciting perceptions.

Intentions. In the first part, we elicit intentions to engage in specific behaviors for five items using 7-point Likert scales ranging from strongly disagree to strongly agree. The five items were the following: In the next five years, I will under no circumstances or situations whatsoever ... (i) donate more money to a good cause than I currently do; (ii) invest any of my own money into financial assets traded on the stock market such as funds or shares; (iii) do more sports than I currently do; (iv) make more environmentally friendly decisions; (v) buy disability insurance or increase coverage.

Our main variable of interest is the second item on investment intention. We choose the formulation "under no circumstances or situation whatsoever" to retain variation in answers given the strong

opposition to the stock market in our sample. The other items function as filler items to obfuscate our interest in investment intentions.

Perceptions. In the second part, we elicit subjects' perceptions about group differences for a list of three groups and four personality traits using 9-point Likert scales. We ask about the difference in personality traits between: (i) Those who regularly make donations for a good cause ('Regular donors') and those who do not regularly make donations for a good cause ('No regular donors'); (ii) Those who invest any money into financial assets traded on the stock market such as funds or shares ('Stockholder') and those without financial assets traded on the stock market ('Non-stockholder'); (iii) Those who have a disability insurance ('Insured') and those who do not have a disability insurance ('Non-insured').

For each of these groups, we elicit perceptions of the traits intelligence, selfishness, generosity, and close-mindedness. Our main variable of interest is how different subjects perceive stockholders and non-stockholders with respect to selfishness. Again, we added the other groups and traits to obfuscate the connection to the information experiment.

G.2 Validation

To attract as many subjects of the main experiment as possible, we offered more than twice the minimum pay required by Prolific (an extrapolated hourly wage of \$18.65). With these incentives, we were able to recruit 428 subjects (78%) of the main experiment for the follow-up survey. As displayed in Table G.1, we find no evidence of selection effects. Which information subjects received or which decisions they made in the information experiment does not differ between the group of subjects participating in the follow-up survey and those not participating.

Between the main experiment and the follow-up survey, subjects completed an average of 15 other studies. At the end of the follow-up survey, we asked subjects to indicate the number of similar studies they had completed in the past two weeks. Overall, 82% of subjects answered with "none," indicating that we successfully created a survey perceived as distinct from the main study. This fraction is a lower bound on the fraction of individuals who do not perceive a connection between follow-up and main experiment because our survey might be similar to one of the other studies that subjects

Table G.1: Follow-up experiment balance test

Variable	Participated in follow-up (1)	Did not participate in follow-up (2)	$H_0: (1) = (2)$ p-value (3)
Prior belief	-16.52	-10.99	0.34
Signal over donation behavior	-10.02	-11.16	0.98
Signal over donation behavior (dummy)	0.39	0.41	0.65
Number of stock option choices	1.85	1.69	0.36
Number of random draw option choices	2.25	2.17	0.51
Age	31.53	29.62	0.19
Women	0.76	0.85	0.04
High income	0.49	0.57	0.10
High wealth	0.58	0.61	0.57
Is primary financial decision-maker	0.64	0.57	0.23
Has college degree	0.35	0.34	0.93
Observations	428	120	

Notes: Column (1) displays mean values of variables of subjects who participated in the obfuscated follow-up survey conducted after the information experiment. Column (2) does the same for subjects who did not participate. The last column shows Wilcoxon rank-sum test p-values.

participated in. Furthermore, not a single subject of the follow-up referenced our main experiment when asked “If you had to guess, what would you say was the purpose of this study?”. These results suggest we successfully created a survey that subjects perceive as distinct from the main experiment.

G.3 Results

We find that subjects who received information that stockholders donated more for a good cause are significantly more willing to consider investing in the future ($p = 0.020$, Wilcoxon rank-sum test) compared to those that received the information that non-stockholders donated more or the same amount.³⁷ They also view non-stockholders as significantly more selfish compared to stockholders ($p = 0.005$, Wilcoxon rank-sum test). Panel A of Table G.2 shows these effects using an OLS regression, controlling for prior beliefs. We find slightly weaker but still persistent and significant effects when we look at the full continuous signal variable (see Panel B of Table G.2). A weaker effect compared to the binary classification of information seems plausible because information on which group donated

³⁷Using Cohen’s d as a standard method to compare effect sizes, we can compare the magnitude of the information treatment effect on investment behavior in the main experiment and investment intentions in the follow-up survey. We find a Cohen’s d of 0.24 for the effect on behavior and 0.26 for the effect on intentions. Thus, both effect sizes are similar in magnitude.

more is easier to memorize than the exact percentage difference.

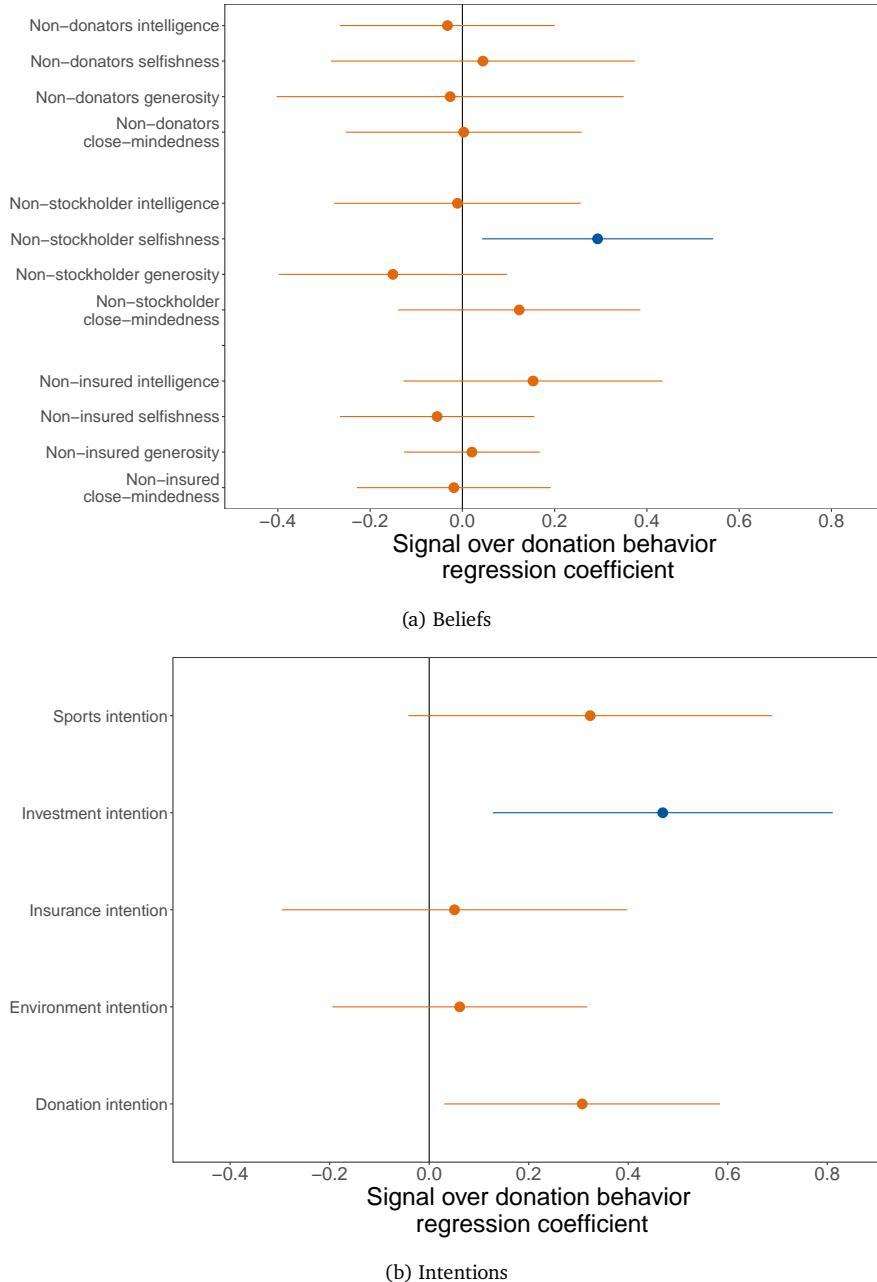
As a placebo check, we also assess the influence of the information on the other variables of the survey. Reassuringly, we find neither an effect of the information on perceptions of other traits, nor on other groups (Figure G.1a). For intentions, only the intention to donate has a coefficient that is significantly different from zero (Figure G.1b). Given the large number of placebo checks, it is unsurprising that one of them also proves to be significant. The general pattern clearly shows that there is no systematic relation between the information and the elicited non-stock market related perceptions and intentions.

Table G.2: Follow-up experiment effect of information on investment intention and perceptions

	<i>Dependent variable:</i>			
	Investment intention		Perception over non-stockholder selfishness	
	(1)	(2)	(3)	(4)
Panel A: Binary signal classification				
Signal over donation behavior (dummy)	0.469*** (0.174)	0.433** (0.176)	0.293** (0.127)	0.342*** (0.125)
Prior belief	0.074*** (0.023)	0.084*** (0.024)	0.041** (0.017)	0.052*** (0.016)
Constant	4.722*** (0.118)	4.982*** (0.522)	4.354*** (0.085)	4.022*** (0.348)
Demographic controls		X		X
Observations	428	422	428	422
R ²	0.039	0.107	0.025	0.100
Panel B: Continuous signal classification				
Signal over donation behavior (full signal)	0.051** (0.025)	0.044* (0.025)	0.030 (0.019)	0.036** (0.017)
Prior belief	0.076*** (0.023)	0.086*** (0.024)	0.042** (0.017)	0.053*** (0.016)
Constant	4.956*** (0.089)	5.271*** (0.522)	4.499*** (0.065)	4.253*** (0.340)
Demographic controls		X		X
Observations	428	422	428	422
R ²	0.036	0.103	0.022	0.096

Notes: The table displays OLS estimates. The dependent variable in columns (1) and (2) is subjects' intention to invest in the stock market at some point in the next five years on a scale from 1 to 7. In columns (3) and (4), the dependent variable is the extent to which subjects perceive non-stockholder to be more selfish than stockholders on a scale from 1 to 9. In Panel A, "Signal over donation behavior (dummy)" is a dummy variable equal to one if subjects received the signal that stockholders donated more than non-stockholders. In Panel B, "Signal over donation behavior (full signal)" denotes the signal received over the difference in donation behavior. Higher values indicate a higher signal in the direction that stockholders donate more relative to non-stockholders, with the unit being 10% differences. "Prior beliefs" is subjects belief over the differences in donation behavior between stockholders and non-stockholders. Higher values indicate that subjects believe stockholders to donate more relative to non-stockholders, with the unit being 10% differences. Robust standard errors in parentheses. Demographic controls include age, gender, education, income, total financial assets, and involvement in household decision-making. Significance levels: *p<0.1; **p<0.05; ***p<0.01.

Figure G.1: Information experiment treatment effects in follow-up



Notes: This figure shows OLS estimates of the dummy variable equal to one if subjects received the signal that stockholders donated more than non-stockholders on different belief (top panel) and intention (bottom panel) variables elicited in the follow-up to the information experiment. Beliefs are elicited for different characteristics and groups using scales from 1 to 9. Higher values indicate that the displayed group is rated higher with the respective trait than the complementary group. The intention variables measure subjects' intention to engage in the described activity. Their intention is elicited as agreement to the statement "In the next five years, I will under no circumstances or situations whatsoever..." on 7-point Likert scales, which we reverse code for ease of exposition. Higher values thus indicate a higher intention to perform the displayed activity. Bars indicate 95% confidence intervals.

H Correcting stereotypical perceptions

This section describes the design and results of the information experiment conducted in the LISS panel mentioned in Section 5.2. The idea of the experiment is to investigate the effect of providing subjects with information on the actual differences between stockholders and non-stockholders. Since subjects' perceptions are overly negative, this type of information could be a natural policy intervention. That such a debiasing intervention could be effective appears plausible in light of the experiment described in Section 4.2, which was designed to identify the causal effect of negative perceptions on investment behavior. However, based on the previous literature it is not obvious that such a debiasing intervention is successful in changing beliefs and behavior in the general population. While providing information on actual differences has generally been found to be successful in reducing misperceptions and changing behavior (Bursztyn and Yang, 2022), notable exceptions exist (e.g., Alesina et al., 2023). Moreover, direct attempts to correct people's beliefs could even backfire, instead increasing stereotypes and animosities (Nyhan and Reifler, 2010; Fouka, 2020). After all, there are differences between stockholders and non-stockholders we show in Section 5.2, which, albeit small, could strengthen subjects' confidence of holding stereotypical beliefs or trigger resistance.

H.1 Design

To investigate the effect of correcting people's stereotypes about stockholders, we conducted an experiment in the second survey we fielded to the LISS panel. Overall, 1,596 non-stockholders participated in the survey. These subjects had participated in our first survey, where we elicited their perceptions (see Section 3) and predicted differences in response behavior (see Section 5.2). We randomly selected half of the subjects and provided them with information on the actual differences between stockholders and non-stockholders. Specifically, they learned the difference in self-assessments for the traits greed, being a gambler, and selfishness (1.17, 1.29, and 0.86 points, respectively, see Section 5.2). They also received complementary information on differences in activities related to these self-assessments. As a reference, we reminded subjects of their predictions regarding these differences. The other half received no information on the actual difference, only the reminder of their predictions.

Afterwards, we elicited subjects' posterior negative perceptions using the module described in Section 3. We subsequently gave them an incentivized investment choice: subjects were endowed with 100 €, which they could allocate between a savings account that pays no interest (safe option) and an ETF that tracks the Amsterdam Exchange index (stock option). A randomly selected subset of 16 subjects had their decisions implemented with real consequences. Their money was invested in the savings account and/or the ETF for a year and paid out afterward. By comparing treatment with control, we are thus able to identify the effect of attempting to debias subjects on beliefs and investment behavior in a representative sample of non-stockholders.

H.2 Results

Effect on posterior perceptions. We find that providing information on the actual differences successfully reduces people's negative perception of stockholders. In the control group, subjects rated stockholders on average 2.83 Likert scale points more negatively than non-stockholders. In the treatment group, stockholders are only rated 2.19 points more negatively ($p < 0.001$, Wilcoxon rank-sum test). An important question, however, is how subjects who hold beliefs close to the actual differences react. To investigate their behavior, we split our sample along the median of subjects' predictions about the response behavior of subjects.³⁸ We find that subjects with median or below stereotypes in the treatment group do not show a significant change in their negative perceptions ($p = 0.91$, paired Wilcoxon signed-rank test). At the same time, subjects in the treatment group with above median stereotypes strongly decrease them when comparing their prior with posterior negative perceptions ($p < 0.001$, paired Wilcoxon signed-rank test).

Effect on behavior. What is the impact of the information on investment behavior? In the full sample, we observe a 6% increase in the average amount invested in the ETF, an insignificant positive effect ($p = 0.55$, Wilcoxon rank-sum test). However, this average effect once again masks substantial heterogeneity. Since subjects with priors close to the actual differences are given information that

³⁸The median prediction is 2 (on a scale of 0 to 10). Within the group of subjects on or below the median, average predictions are 0.55 for greed, 1.46 for gambler, and 0.33 for selfish. Thus, this group has, on average, beliefs close to the actual differences. Within the group of subjects with above median predictions, averages are 3.91, 5.70, and 2.86, revealing substantial stereotypes. Using instead the negative views of stockholders measure defined in Section 3 or other splits yield similar results.

Table H.1: Effect of providing information about actual differences between stockholders and non-stockholders on investment behavior

	<i>Dependent variable: Money invested in ETF</i>			
	Above median stereotypes		Median or below stereotypes	
	(1)	(2)	(3)	(4)
Information treatment	6.083** (2.721)	5.415** (2.620)	-1.774 (2.608)	-1.006 (2.541)
Constant	29.743*** (1.846)		33.214*** (1.830)	
Demographic controls		X		X
Observations	736	736	858	858

Notes: The table displays OLS estimates. The dependent variable denotes the amount of money (out of 100€) that subjects allocate to an exchange-traded fund. “Information treatment” equals one if the subject receives information about the actual differences between stockholders and non-stockholders in self-assessed greed, being a gambler, and selfishness and related activities. Demographic controls include age, gender, education, income, and total financial assets. Robust standard errors in parentheses. Significance levels: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

confirms their beliefs, we would not predict changes in their investment behavior. Instead, the effect should be concentrated among subjects who receive information correcting their stereotypes. Using the same median split as before, Table H.1 displays the treatment effect of providing information about the true differences on the amount of money invested in the stock option. We find in Column (1) that subjects with ex-ante above median stereotypes significantly increase the amount invested in the stock option by about 20%. At the same time, as displayed in Column (3), subjects with median or below median stereotypes reduce their investment only by an insignificant amount. Adding controls in Columns (2) and (4) does not change the results. Hence, we observe a significant effect on subjects who receive information correcting their stereotypes, and no backlash effects by subjects who receive information more closely aligned with their prior beliefs.³⁹

³⁹We also elicited investment intentions both in the short run (six months) and long run (five years). In line with the strong stock market aversion previously documented, we find intentions to be very low. For instance, 68% agree with the statement that they would under no circumstance whatsoever invest in the stock market in the next five years. Although the treatment increases intentions in the expected direction, the effects are not significant.

I Research transparency

Table I.1: Overview of samples

Label	Provider	<i>N</i>	Date	Covered in	Description
Perception pre-test	Pureprofile	194	April 2021	Section 3, Appendix C	Survey to select character traits based on identity relevance and association with stockholders.
First LISS panel survey	Centerdata	3,272	May 2021	Sections 3, 3.2, and 5.2	Survey to measure people's perceptions of stockholders and non-stockholders in the Netherlands.
Second LISS panel survey	Centerdata	1,594	October 2021	Sections 3 and 5.1, Appendix H	Follow-up to the first survey to collect additional measures, investigate implications and the effect of correcting stereotypes.
Cross-country survey	Bilendi	5,130	March-April 2023	Sections 3 and 3.2	Survey to measure people's perceptions of stockholders and non-stockholders in Australia, Germany, Italy, Japan, Mexico, South Korea, Spain, Sweden, the United Kingdom, and the United States.
Perception robustness survey	Panel Inzicht	1,016	October 2021	Section 3, Appendix D.1	Additional surveys to measure perceptions using different elicitation methods
Information generation survey	Prolific	272	April 2022	Sections 4.2, 4.3 and 5, Appendix E	Survey to generate the information about the donation behavior of stockholders and non-stockholders for the information experiment.
Framing experiment	Prolific	515	May 2022	Section 4.1	Experiment to test Prediction 1 of the conceptual framework.
Information experiment	Prolific	548	May 2022	Section 4.2	Experiment to test Prediction 2 of the conceptual framework.
Information experiment follow-up survey	Prolific	428	May 2022	Section 4.2	Survey to investigate experimenter demand effects and validity of the treatment effects of the information experiment.

For an overview of all samples used in the paper, see Table I.1. All surveys that include experimental variation were preregistered at aspredicted.org. The preregistrations include details on the experimental design, the sampling process and planned sample size, exclusion criteria, hypotheses, and the main analyses. This section documents deviations from the preregistration.

I.1 Framing experiment

The framing experiment (Section 4.1) was preregistered at https://aspredicted.org/66D_2XD. In the preregistration, we specified that we would exclude subjects who chose the safe option each time in the calibration part. To maximize sample size and comparability with the information experiment, we report the results in the main text without excluding these subjects. Table I.2 replicates the results using the preregistered exclusion restrictions. The resulting treatment effect is highly significant and slightly larger than the one reported in the main text.

Table I.2: Replication of Table B.5 using preregistered sample

Panel A: Between-subject effect		<i>Dependent variable: Choice of risky option</i>	
		(1)	(2)
Constant		0.579*** (0.022)	0.648*** (0.085)
<i>Stock Framing</i>		-0.154*** (0.034)	-0.147*** (0.034)
Demographic controls			X
Subjects		418	412
Observations		1,672	1,648

Panel B: Within-subject effect		<i>Dependent variable: Choice of risky option</i>	
		(1)	(2)
Constant		0.560*** (0.017)	0.614*** (0.071)
<i>Stock Framing</i>		-0.139*** (0.018)	-0.140*** (0.019)
Demographic controls			X
Subjects		418	412
Observations		3,344	3,296

Notes: The table replicates Table B.5 for a restricted sample in which we exclude subjects who chose the safe option each time in the calibration part.

I.2 Information experiment

The information experiment (Section 4.2) was preregistered at https://aspredicted.org/1B8_MXD. In the preregistration, instead of the OLS analysis shown in columns (4) and (5) of Table 3 with the choice of the stock option as the dependent variable, we specified a slightly different specification in which choices of stock option and draw options enter as separate observations. Table I.3 replicates the results using the preregistered specification. As in the specification reported in the main text, the preregistered specification documents that the information about donation behavior significantly influences the likelihood that the stock option is chosen. The follow-up survey reported in Section 4.2.3 was not preregistered.

Table I.3: Replication of the result of Table 3 (columns (4) and (5)) using preregistered specification

	<i>Dependent variable:</i>	
	Choice of risky option	
	(1)	(2)
Constant	0.558*** (0.016)	
<i>Stock Framing</i>	-0.080*** (0.019)	-0.082*** (0.019)
Prior belief	0.002 (0.004)	0.001 (0.004)
Prior belief \times <i>Stock Framing</i>	0.009** (0.004)	0.009** (0.004)
Signal over donation behavior	-0.004 (0.004)	-0.006 (0.004)
Signal over donation behavior \times <i>Stock Framing</i>	0.012*** (0.005)	0.012*** (0.005)
Demographic controls		X
Subjects	548	541
Observations	4,384	4,328

Notes: The table replicates columns (4) and (5) of Table 3 using a different specification in which all eight binary choices between the risky option described as a stock investment and the safe option of a subject enter as separate observations.

I.3 Correcting stereotypes experiment

The experiment that corrected stereotypes (Section 5.2, with details in Appendix H) was preregistered at https://aspredicted.org/blind.php?x=DF3_5YR. The preregistration specified four exclusion restrictions. Our analysis only employs the first two restrictions. The latter two restrictions concern the time respondents spend on the survey. Due to errors in the time spent variable, we cannot employ these restrictions. However, judging from previous experience with LISS surveys, these restrictions would have affected only a very small set of respondents anyway (less than 5%). Furthermore, the preregistration included three outcomes related to financial decision-making. To keep the analysis aligned with the previous experiments reported in Section 4, we mainly focus on the first, the incentivized investment decision. In Footnote 39, we discuss the other two. The preregistration also specified a series of additional heterogeneity and exploratory analyses. These are not included in the paper. The analyses using the median split were not preregistered.

J Variables

J.1 Sample demographics

The following Tables J.1, J.2, and J.3 provide information on the sample demographics of the various samples used in the paper.

Table J.1: Overview of sample demographics Netherlands

Variable	CBS (2020)	Full LISS panel	First survey LISS panel	Second survey LISS panel
Gender				
Women	51%	54%	51%	53%
Age				
16 - 34 years	29%	25%	13%	9%
35 - 64 years	48%	46%	49%	46%
65 years and older	23%	28%	38%	45%
Education				
University degree	33%	40%	29%	27%
Net income				
Below 20,000 euros/dollars	20%	20%	17%	20%
20,000 - 50,000 euros/dollars	51%	51%	59%	61%
Above 50,000 euros/dollars	30%	29%	24%	19%
Sample size	6,462	3,272	1,594	

Notes: CBS stands for Centraal Bureau voor de Statistiek, the statistical bureau of the Netherlands.

Table J.2: Overview of sample demographics cross-country study

Variable	Australia	Germany	Italy	Japan	Mexico	South Korea	Spain	Sweden	United Kingdom	United States
Gender										
Women	50%	50%	50%	50%	52%	50%	51%	51%	48%	50%
Age										
16 - 34 years	30%	27%	24%	25%	44%	27%	23%	31%	29%	26%
35 - 64 years	52%	58%	59%	55%	51%	62%	62%	54%	61%	51%
65 years+	18%	15%	16%	20%	5%	12%	15%	15%	11%	23%
Sample size	502	499	500	513	511	510	498	508	525	564

Table J.3: Overview of sample demographics Prolific (US)

Variable	ACS (2020)	Information generation survey	Description experiment	Information experiment
Gender				
Women	51%	79%	69%	78%
Age				
16 - 34 years	46%	72%	58%	70%
35 - 64 years	38%	27%	38%	28%
65 years and older	16%	1%	4%	2%
Education				
University degree	28%		36%	34%
Net income				
Below 20,000 euros/dollars	29%	20%	24%	28%
20,000 - 50,000 euros/dollars	34%	37%	36%	32%
Above 50,000 euros/dollars	37%	43%	40%	40%
Sample size		272	515	548

Notes: ACS stands for American Community Survey, administered by the US Census Bureau. Education was not elicited in the survey used to generate the donation information (third column).

J.2 Demographic and financial variables

This section provides further information about the calculation of background variables for the Dutch sample. For the US samples on Prolific we elicited all demographic variables during our own data collection.

Is primary financial decision-maker Each household points out one person who “takes care of financial matters in the household”. Dummy whether subjects is that person.

Age Refers to the age of the primary financial decision-maker of the household participating in the survey. Obtained from the Dutch administrative data (or the LISS background questionnaire for regressions not involving admin data).

Gender Refers to the gender of the primary financial decision-maker of the household participating in the survey. Obtained from the Dutch administrative data (or the LISS background questionnaire for regressions not involving admin data).

Education Based on achieved educational level. Obtained from the LISS background questionnaire. The Dutch educational levels are categorized as follows:

Lower secondary and below: primary school, vmbo

Upper secondary: mbo, havo, vwo

Tertiary: hbo, wo

In the US sample, we use the following categories: “Less than high school degree,” “Graduated High school or equivalent,” “Associate degree,” “Professional degree (JD, MD),” “Some college but no degree,” “Bachelor’s degree,” “Post-graduate degree.”

Income Monthly net income of the household. The measure is equivalized by dividing through the square root of the number of household members (square root scale). In regressions, we add terciles of this variable as categorical variable. Obtained from Dutch admin data (or the LISS background questionnaire for analyses not involving admin data). In the US sample, we use household net income as elicited in our own questionnaire and do not equivalize the measure as we do not have information about the number of household members.

Wealth Wealth of the household including financial assets (safe and risky financial assets) and non-financial assets like real estate. Debts are subtracted. The measure is equivalized by dividing through the square root of the number of household members (square root scale). In regressions, we add terciles of this variable as categorical variable. Obtained from Dutch admin data for the beginning of 2020.

Financial assets Total financial assets of the household including safe and risky financial assets. The measure is equivalized by dividing through the square root of the number of household members (square root scale). In regressions, we add terciles of this variable as categorical variable. We use this measure for analyses not involving admin data. Elicited in the LISS asset questionnaire. In the US sample, we use personal total financial assets as elicited in our own questionnaire.

Owns any risky financial assets Dummy variable if risky financial assets in the household are larger than 0. Obtained from Dutch admin data for the beginning of 2020.

Share of risky financial assets Risky financial assets of the household divided by total financial assets of the household. Set to missing if total financial assets do not exceed 0. Obtained from Dutch admin data for the beginning of 2020.

J.3 Stock market knowledge and trust variables

Self-assessed stock market knowledge Based on the agreement on a 7-point likert scale to the statement “At the moment, I am confident in my knowledge about how the stock market works.” Elicited in our second survey fielded to the LISS panel.

Self-assessed ability to be successful in the stock market Based on the agreement on a 7-point Likert scale to the statement “I currently do not have what it takes to be successful in trading on the stock market.” Variable is reverse coded for ease of interpretation. Elicited in our second survey fielded to the LISS panel.

Trust in bankers Subjects were asked to state their trust in bankers on a 10-point likert scale (zero-“Not at all trustworthy”, ten-“Completely trustworthy”) based on the item “Please indicate

whether you think that people in the following professions can be trusted.”

Trust in financial advisors Subjects were asked to state their trust in financial advisors on a 10-point likert scale (zero-“Not at all trustworthy”, ten-“Completely trustworthy”) based on the item “Please indicate whether you think that people in the following professions can be trusted.”

J.4 Behavioral determinants of portfolio choice

Risk aversion index We employ a quantitative lottery choice task and a qualitative risk question (“Are you, in general, willing to take risks?”) based on Falk et al. (2022). We use the experimentally validated weights by Falk et al. (2022) to calculate an index such that the qualitative risk component is weighted slightly higher at 53% (after standard normalizing both components). Elicited in the LISS panel by von Gaudecker et al. (2025) in May 2021.

Financial numeracy We employ four questions based on van Rooij et al. (2011) to measure financial numeracy as elicited in the LISS panel by von Gaudecker et al. (2025) in May 2021. An example multiple-choice question reads: “Suppose you have 1000 euros in a savings account and the interest rate is 1 % per year. How much do you think you will have in the savings account after three years if you leave all the money in this account: more than 1010 euros, exactly 1010 euros, less than 1010 euros, you can’t say with the information given”. We count the number of correct answers.

Ambiguity aversion We calculate the ambiguity aversion index as defined in Baillon et al. (2018). The measure is based on up to 28 binary choices between an ambiguous option related to a bet on the stock market (e.g. whether the largest Dutch stock market index goes up by at least 10 % over the next six months) and a risky option with known winning probability as elicited in the LISS panel by von Gaudecker et al. (2025) in May 2021. Generally speaking, the index captures the extent to which subjects prefer the risky option over the ambiguous option for the same subjective probability.

Likelihood insensitivity We calculate the index of ambiguity-induced likelihood insensitivity as defined in Baillon et al. (2018). The measure is based on up to 28 binary choices between an

ambiguous option related to a bet on the stock market (e.g. whether the largest Dutch stock market index goes up by at least 10 % over the next six months) and a risky option with known winning probability as elicited in the LISS panel by von Gaudecker et al. (2025) in May 2021. Generally speaking, the index captures to what extent subjects' valuation of a bet on an event increase in the likelihood of that event.

Belief over stock returns Following Hurd et al. (2011), subjects are asked "Suppose someone invests 1000 euros in the AEX today and in six months looks at what the AEX has done. How likely is it that this investment will be worth more than 1000 euros?". Elicited in the LISS panel in May 2020.

General trust Following Guiso et al. (2008), we use the response to the question "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Please indicate a score of 0 to 10." Obtained from the 2020 personality questionnaire of the LISS panel.

Right-wing political orientation Following Kaustia and Torstila (2011), we use the response to the question "In politics, a distinction is often made between "the left" and "the right". Where would you place yourself on the scale below, where 0 means left and 10 means right?". Obtained from the 2020 politics and values questionnaire of the LISS panel.

J.5 Identity scale

Table J.4 provides the wording of the items used for the identity scale. As mentioned in the main text, we selected five items from established identification scales (Doosje et al., 1995; Klor and Shayo, 2010)⁴⁰ and applied them to the stockholder/non-stockholder context. We use the same asset categorization to define the group of stockholders and non-stockholders as in our elicitation of people's views of stockholders (Section 3). For each item, subjects were asked whether they agree or disagree with the respective statement on a scale from one ("fully disagree") to seven ("fully agree"). Follow-

⁴⁰Henkel et al. (2023) show that this scale, used in the context of vaccination identification, is strongly related to the broader identification scale of Leach et al. (2008).

ing standard practice, we code a subject as agreeing to a statement if they select at least five on the 7-point scale.

Table J.4: Identity scale items

Item
1 Not having risky financial investments is an important part of my identity.
2 I am proud that I have no risky financial investments.
3 When a person or the media criticizes people for not having risky financial investments it feels like a personal insult.
4 I have very little in common with people who have risky financial investments.
5 If I would learn that a person has risky financial investments, I would immediately feel less connected to that person.