

# 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 survey data from the US and the Netherlands, we first document that the overwhelming majority of respondents view stockholders negatively – they are perceived as greedy, gambler-like, and selfish individuals. We then provide experimental evidence that such perceptions of identity-relevant characteristics causally influence decision-making: if people view stockholders more negatively, they are less likely to choose stock-related investments. Furthermore, by linking survey and administrative data, we show that negative perceptions strongly predict households' stock market participation, more so than leading alternative determinants. Beyond investment decisions, perceptions predict individuals' polarizing behavior towards stockholders, support for taxation and regulation of financial markets, and misreporting in surveys. Our findings provide a novel explanation for the puzzlingly low stock market participation rates around the world, new perspectives on the malleability of financial decision-making, and evidence for the importance of identity in economic decision-making.

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

**JEL Classification:** G41, G51, D14, D83

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**Preregistration:** The study was preregistered at [aspredicted.org](https://aspredicted.org) (#96596, #97589 and #79283). See also Appendix G on research transparency.

# 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 people do not invest in stocks (Gomes, Haliassos, and Ramadorai, 2021). Widespread avoidance persists even among wealthy households and remains largely unexplained by classical preference- or constraint-based explanations.<sup>1</sup> The resulting underdiversification of households' portfolios has major implications for societal challenges such as wealth inequality, financial stability, and the design of retirement pension systems (e.g., Fagereng, Gottlieb, and Guiso, 2017; Kuhn, Schularick, and Steins, 2020).

Despite the potential advantages of stock investments for households and their importance to society, the media frequently characterize stock investors in ways 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 investors as selfish individuals willing to take extreme risks at the expense of others. Likewise, popular books about stock market investing describe investors as highly motivated by greed (Shefrin, 2002; Nofsinger, 2017).

This paper investigates how people view stockholders and how these views influence financial decision-making. Using large-scale survey data from the United States (US) and the Netherlands, we document widespread negative perceptions of stockholders. To conceptualize the relationship between perceptions 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. Testing the framework's predictions in two preregistered experiments, we provide evidence that subjects' perceptions of stockholders causally drive financial decisions. Extending the analysis to field data, we demonstrate that perceptions predict households' stock market participation as identified by administrative data.

In the first step of our empirical analysis, we measure individuals' perceptions of stockholder and non-stockholder characteristics in the US and the Netherlands. 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 survey 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 data from 402 US participants on the online survey platform Prolific and 3,272 Dutch respondents of the LISS panel. The LISS panel builds upon a probability sample of the Dutch population, employing special efforts to ensure that the sample is representative of the population. Respondents consider stockholders and non-stockholders in their respective countries and separately

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<sup>1</sup>As 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).

rate how they perceive the individuals of each group with respect to the three character traits. Since we empirically validate that the traits are considered negative traits, comparing ratings between groups reveals whether respondents view one group more negatively.

We document that a large majority of respondents view stockholders negatively. In both countries, stockholders are rated significantly more greedy, gambler-like, and selfish than non-stockholders. Averaging over the three traits, 86% of US and 81% of Dutch respondents hold negative perceptions of stockholders. In a series of robustness checks, we replicate widespread negative perceptions using alternative elicitation methods and framing variations. For instance, respondents rate stockholders significantly more negatively when considering positively framed characteristics.

Are people’s negative perceptions of stockholders accurate? We show that they are stereotypical, i.e., exaggerated representations of reality. While stockholders indeed self-assess as more greedy, gambler-like, and selfish, and behave more selfishly than non-stockholders, when we ask subjects to predict these responses, they significantly overestimate the actual differences. We provide evidence consistent with the representative heuristic (Tversky and Kahneman, 1983) formalized in the stereotypes model of Bordalo et al. (2016) as being responsible for the exaggeration.

In the second step of our analysis, we test a key prediction of our framework: since people largely view stockholders negatively, whether a decision is associated with the stock market should influence their decision-making. An ideal test of this prediction compares the choice behavior of individuals between two identical investments that only differ 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 whether people dislike stock investments relative to non-stock investments even when all outcome-related features are held constant, a type of behavior we label *stock market aversion*.

In our experiment, we employ a simple incentivized investment choice in which subjects repeatedly 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 Description* 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 Description* 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. We are thus able to identify the effect of varying the association of an investment on behavior, keeping outcome-related features constant.

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 Description* treatment to 36% in the *Stock Description* 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 Description* but exhibit a strictly lower willingness to invest under the *Stock Description*. Accordingly, we find support for the prediction of our framework that the mere association of an option with the stock market leads to aversion.

In a third step, we provide causal evidence that subjects' negative perception of stockholders is the mechanism driving stock market aversion. To establish causality, 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 drew ten stockholders and ten non-stockholders out of a separate sample of 272 stockholders and non-stockholders that allocated 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 generated information. For example, some subjects received the information that in their draw, stockholders donated 10% more to the charity than non-stockholders, while others were informed that in their draw, non-stockholders donated 30% more. After providing the information, 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.<sup>2</sup> Since deciding how much to donate instead of taking for oneself is commonly considered a signal about prosociality, we expect the information to shift subjects' perceptions.

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 more positively 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 treatment effect found in the description 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%). Thus, negative perceptions are a key contributor to the stock market aversion documented in our experiments.

In a follow-up survey conducted several days later, we show that the treatment variation persistently changes subjects' perceptions of stockholders and influences intentions to invest their own money in the stock market. Subjects who received the information that stockholders donated more perceive stockholders as less selfish and report a higher intention to invest than those who received the information that non-stockholders donated more ( $p < 0.01$ ). Furthermore, 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 are unlikely to confound our results (Haaland, Roth, and Wohlfart, 2021).

Extending our analysis to field data, we demonstrate that negative perceptions (i) significantly predict stock market participation revealed through administrative records and (ii) are quantitatively important compared to leading alternative determinants of investment decisions proposed in the literature. Using the LISS panel enables us to link subjects' perceptions of stockholders to their asset allocations based on tax records provided by Statistics Netherlands. To assess the importance of perceptions in predicting investment decisions, we link our survey in the LISS panel with previous questionnaires to obtain measures of subjects' risk aversion, beliefs regarding stock returns, financial

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<sup>2</sup>Subjects might update about factors influencing investment behavior that are unrelated to perceptions. Using our controlled decision environment allows us to abstract from these effects. For instance, even if the information changes subjects' beliefs regarding the profitability of stock investments, the returns of the stock decision are fixed in our experiment.

numeracy, general trust, 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 4.3 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; for instance, it is 25% larger than the standardized coefficient of risk aversion.

People's identity concerns regarding stockholders are revealed not only through financial decisions but also through qualitative statements. We show that people themselves consider not having stocks as a vital part of their identity by applying items from established group identification scales to the financial context. For instance, 40% of non-stockholders in the LISS panel are "proud" to not own stocks. Notably, negative perceptions strongly predict the degree of identification, providing further evidence for the relevance of perceptions to people's identity.

In a series of additional analyses, we highlight the importance of people's perceptions of stockholders for attitudes and behavior beyond financial decisions. First, non-stockholders distribute twice as much money to non-stockholders than to stockholders in an incentivized allocation decision. The more negatively subjects view stockholders, the more strongly they exhibit this type of in-group favoritism. Second, non-stockholders hold highly polarized opinions regarding the extent to which financial markets should be taxed and regulated. While 56% advocate for increases in taxation and regulation, 31% strictly oppose such measures. Even after controlling for factors such as subjects' political ideology, negative perceptions explain the level of support for increases in taxation and regulation. Third, we examine misreporting behavior in surveys using our linked survey-admin data. Our framework suggests that individuals potentially misreport holding risky financial assets to avoid identity conflicts. Consistent with this hypothesis, we observe that 30% of stock-owning households report not owning stocks in the survey. Importantly, negative perceptions predict this type of misreporting: a one standard deviation increase in negative perceptions is associated with a 4.5 pp. decrease in (correctly) reporting being a stockholder.

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 stock aversion through preferences and beliefs related to investment outcomes as well as constraints (Gomes, Haliassos, and Ramadorai, 2021).<sup>3</sup> 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 stock aversion 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) doc-

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<sup>3</sup>Preference-based explanations investigate how different weightings of outcomes induced by risk-, ambiguity- (e.g. Dimmock et al., 2016), loss averse (Barberis, Huang, and Thaler, 2006) or likelihood insensitive preferences (Dimmock, Kouwenberg, and Wakker, 2016) influence stock market 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 fixed costs of participation (Vissing-Jorgensen, 2004), limited stock market literacy (e.g. Rooij, Lusardi, and Alessie, 2011) and cognitive function (Grinblatt, Keloharju, and Linnainmaa, 2011) prevent people from investing in the stock market.

ument that political ideology is strongly correlated with stock market participation in Finland. This relationship could be explained by differences in perceptions along the political spectrum, which we indeed observe in our data. Left-wing individuals, which are less likely to participate in the stock market, hold significantly more negative views. Another strand of literature finds that cultural background, social interactions and involvement matter for financial decision-making (Haliassos, Jansson, and Karabulut, 2017; Kuchler and Stroebel, 2021). Our framework suggests a specific channel through which culture and social interactions 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, Rodnyansky, and Zhuravskaya, 2013; D’Acunto, Prokopczuk, and Weber, 2019; D’Acunto, 2020; Lenz, 2022). While these studies consider individuals’ trust in financial markets as a potential mechanism predicting stock market participation (Guiso, Sapienza, and Zingales, 2008), anti-finance sentiments fostering negative images of stockholders provide an alternative rationale for the documented patterns.

Second, we contribute to the emerging literature on the relationship between identity and economic behavior (Akerlof and Kranton, 2000; Shayo, 2020). Identity has been found relevant for workers’ productivity in firms (Forman, Ghose, and Wiesenfeld, 2008), consumption choices (Atkin, Colson-Sihra, and Shayo, 2021), and labor market supply (Oh, 2021).<sup>4</sup> Bauer and Smeets (2015) find that investors’ degree of 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 making similar decisions to themselves.<sup>5</sup> Through this empirical framework, we quantify the effects of identity concerns, making them comparable between individuals.

Third, we add 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, Gennaioli, and Tabellini (2021). We empirically document the connection between identity, stereotypes, and financial decision-making.

In addition, our framework and evidence suggest new directions for designing interventions to increase stock market participation. The strong aversion to any form of stock-related options we document in our experiments suggests that classical interventions, such as highlighting potential gains from investing, are inadequate for convincing the substantial share of highly identity-minded households. Indeed, a meta-analysis covering 201 studies indicates that interventions to improve financial literacy generally have very limited effects on behavior (Fernandes, Lynch, and Netemeyer, 2014). Instead, our results suggest that interventions aimed at decreasing negative perceptions of

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<sup>4</sup>More generally, identity has been found to influence behavior in settings such as judicial decisions (Shayo and Zussman, 2011), married women’s income (Bertrand, Kamenica, and Pan, 2015), and civil conflict (Depetris-Chauvin, Durante, and Campante, 2020). For a review of the large literature in psychology regarding identity, see Burke and Stets (2009) and Stets and Serpe (2013) for overviews.

<sup>5</sup>A related idea is that people care about the characteristics of others or themselves and use behavior as signaling devices (Bénabou and Tirole, 2006, 2011). These image or reputational concerns have been shown as influential in both private/anonymous settings (Grossman and van der Weele, 2017; Falk, 2021; Mechtenberg et al., 2022; Schneider, 2022) and when observed by others (e.g., Ariely, Bracha, and Meier, 2009). In addition, status concerns (Bursztyn et al., 2018) and social pressure (Bursztyn and Jensen, 2017) have been demonstrated to influence economic behavior.



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 affect decision-making in our experiment. We further highlight important features of effective interventions emerging from our results in the conclusion.

## 2 Conceptual framework

In this section, we discuss the idea that people’s perceptions of other people’s character traits matter for their decision-making – in our application, the decision of whether to invest in the stock market. We use the framework to develop our hypotheses and guide our analyses in the next sections.

People are characterized by a set of attributes or traits  $(q_1, q_2, \dots, q_H)$  which influence behavior and attitudes. We focus on identity-relevant characteristics, i.e., individuals care about whether they and other people have these characteristics. For example, traits related to morality have been found to be central to people (Wojciszke, Bazinska, and Jaworski, 1998; Goodwin, Piazza, and Rozin, 2014; Strohming and Nichols, 2014). Higher values of  $q_h$  indicate a more positive evaluation of the respective trait. For simplicity, we assume that individual  $i$  cares about a weighted average  $q^i$  of the set of identity-relevant traits.<sup>6</sup>

An individual  $i$  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 of the prospect is a flexible function  $u_i(z_a)$  which captures the various outcome-based forms of belief formation and uncertainty attitudes proposed by the literature (risk- or ambiguity aversion, loss aversion, etc.).<sup>7</sup>

The key element in our model is that individuals not only care about outcomes of  $a$  but also about the characteristics of the group of individuals making similar decisions. In particular, there exists a set of groups  $G$  to which individuals can belong to and potentially identify with. Individuals categorized by a group share some unique group-defining feature related to the action set. Let  $g : A \rightarrow G$  denote a mapping indicating which group is associated with each action.

Associating oneself through an action with a group that is perceived as negative (positive) in terms of identity-relevant characteristics creates negative (positive) utility. For simplicity, we assume that people care about the average value of the identity-relevant characteristics within a group  $q$ , however this can be easily expanded to capture more flexible aggregation functions. Accordingly, for a given action  $a$ , individual  $i$  forms a belief over the average characteristics  $q^i$  of members of group  $g$ :  $\hat{\mathbb{E}}_i [q^i \mid g(a)]$ . This belief then directly enters individuals’ utility function:

$$U_i(a) = u_i(z_a) + \theta \hat{\mathbb{E}}_i [q^i \mid g(a)]$$

The importance of characteristics-based utility induced by the belief relative to outcome-based utility  $u_i(z_a)$  is captured by the parameter  $\theta$ . Importantly, this form of identity concern does not require visibility to others. We hypothesize that associating oneself with a group having negative character

<sup>6</sup>Our predictions remain unchanged if we instead assume that people care about a unidimensional score based on all traits, with each trait monotonically influencing the score.

<sup>7</sup>In particular,  $u_i(z_a)$  might depend on her weighting function over the events (where subjective probabilities are a special case for subjective expected utility maximizers), as well as her preferences over outcomes and endowments.

traits induces negative utility even privately. The mechanism is similar to violations of group prescriptions (e.g., gender roles), which can create “anxiety and discomfort in oneself” (Akerlof and Kranton, 2000).<sup>8</sup> Consequently, characteristics-based utility could influence decisions that are made in private and predominantly unobserved by others, like investment decisions.<sup>9</sup>

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

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

That is, even if the potential material gains from investing are large, people will abstain from investing if the group of stockholders is seen as sufficiently negative compared to the group of non-stockholders. Therefore, our empirical analysis in Section 3 will investigate people’s views of stockholders compared to non-stockholders. In order to establish that such perceptions matter for decision-making, our framework makes the following two key predictions, which we will empirically test in the context of financial decision-making in Section 4.

**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 ( $\hat{\mathbb{E}}_i [q^i | G_1] > \hat{\mathbb{E}}_i [q^i | G_2]$ ). Changing the association of an action  $a$  from group  $G_1$  to  $G_2$ , keeping all other aspects constant, reduces the attractiveness of  $a$ .

**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  $G$ .

### 3 Perceptions of stockholders

In this section, we document people’s perceptions of the characteristics of stockholders and non-stockholders. We start by introducing character traits relevant to people and our method of measuring perceptions over these traits in Section 3.1 before describing the data sources in Section 3.2. We then present the distribution of perceptions in Section 3.3 and shed light on the accuracy and determinants of the documented perceptions in Section 3.4.

#### 3.1 Measuring 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

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<sup>8</sup>A potential micro-foundation of this concern is that individuals are uncertain about their character traits and infer them from actions (Bénabou and Tirole, 2011). A group’s characteristic then can serve as signal for one’s own character if the action is diagnostic of one’s character.

<sup>9</sup>It thus differs from status concerns – the desire to signal high income or wealth to others (Heffetz and Frank, 2011).



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 a search in media (articles, books and movies). We then conducted a pre-test to select the three best performing character traits based on the two mentioned conditions, see Appendix C for details. The selected traits, supplemented with accompanying definitions<sup>10</sup> that were also given to subjects, were the following:

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

**Gambler** A person that 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.

To elicit perceptions of stockholders, we asked subjects to consider the entire adult Dutch population (or US population respectively) divided into two groups: those who hold any risky financial assets (e.g., stocks or funds) and those who do not.<sup>11</sup> For both groups, subjects then stated their assessment for the respective trait ('People who (do not) own risky financial assets are on average ...') on a scale from 0 'totally disagree' to 10 'totally agree'. See Appendix I for the complete wording of all questionnaires. We chose this measurement as it is easily understood by subjects, while still being quantifiable. It takes subjects little time to answer (generally less than 30 seconds), and is thus straightforward to include in surveys.<sup>12</sup>

In our analysis in the next sections, we employ two measures of perceptions of stockholders: First, we calculate on the individual level subjects' perceptions of stockholders relative to non-stockholders for each trait individually. This is defined as a subject's assessment for stockholders of a trait minus the assessment for non-stockholders of the same trait. Second, we define *average negative perceptions* as the mean of perceptions over all three considered character traits. We label this measure "negative perceptions" because higher values indicate higher judgements concerning the three negatively framed traits. While, in general, the three selected traits may also have positive aspects, subjects view them negatively (see Appendix C).

### 3.2 Data sources

We use two samples to analyze perceptions of stockholders. They span two countries, the Netherlands and the US, which have markedly different stock market participation rates. The Netherlands has a relatively low participation rate of 19.3% (direct or indirect holding of stocks; Badarinza, Campbell, and Ramadorai, 2016), comparable to many other European countries such as Germany (23.7%) or

<sup>10</sup>The 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.

<sup>11</sup>Subjects were provided a list of assets that are considered risky financial assets, and a list of assets that are not. We used the definition of Statistics Netherlands to categorize assets. We chose this procedure for two reasons. First, it is grounded on an objective criterion that leaves no room for interpretation. Second, it allows us to match subjects' responses in the LISS panel to administrative data (see Section 5.1), since Statistics Netherlands only provides aggregate variables using this definition. Since assets labeled as risky financial assets are mainly traded on the stock market, we will use the terms "stockholder" and "has risky financial assets" interchangeably.

<sup>12</sup>Accordingly, similar trait ratings have been employed in the context of political ideology in political science (e.g., Iyengar, Sood, and Lelkes, 2012; Hobolt, Leeper, and Tilley, 2021)

France (23%). In contrast, the US has a comparably high rate of 49.8% (Badarinza, Campbell, and Ramadorai, 2016).

**Netherlands.** For the Netherlands, we mainly use 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). Panelists participate in monthly internet surveys and are well compensated for their involvement. Special efforts are made to ensure that the panel represents the adult Dutch population well. For example, participants without internet connection are given devices to participate in the surveys of the panel. In addition to the sample being representative, a major advantage is that we can use a rich set of additional measures obtained by the LISS core studies and other researchers' fielding surveys to the panel. Finally, the use of the LISS panel allows us to link participants' responses to Dutch administrative data, which includes information on financial assets of the respective households based on tax records. We focus on respondents who report to be the main financial decision-maker of their respective household. We invited a random sample of 4,375 respondents, of which 3,272 participated in our survey. See Appendix Table B.2 for a summary of demographic characteristics. For robustness surveys (see the second part of Section 3.3), we use Panel Inzicht, which is one of the largest providers of online surveys in the Netherlands. Here, we collect data from 1,016 participants who are broadly representative of the Dutch population in terms of age and gender.

**United States.** For the US, we use Prolific, one of the leading market research companies used in social science research. While not representative of the US population (see Appendix Table B.2 for demographics), subjects on Prolific have been shown to provide high quality responses in terms of attention and comprehension (Eyal et al., 2021; Gupta, Rigotti, and Wilson, 2021). To elicit subjects' perceptions of stockholders and non-stockholders, we collected data from 402 participants (see again Appendix Table B.2 for sample characteristics). We also used Prolific to investigate the relation of perceptions and financial decision making, discussed in Section 4. All experiments on Prolific were programmed in oTree (Chen, Schonger, and Wickens, 2016). For an overview over all surveys and experiments included in this paper, see Appendix Table B.1.

### 3.3 Elicited perceptions of stockholders

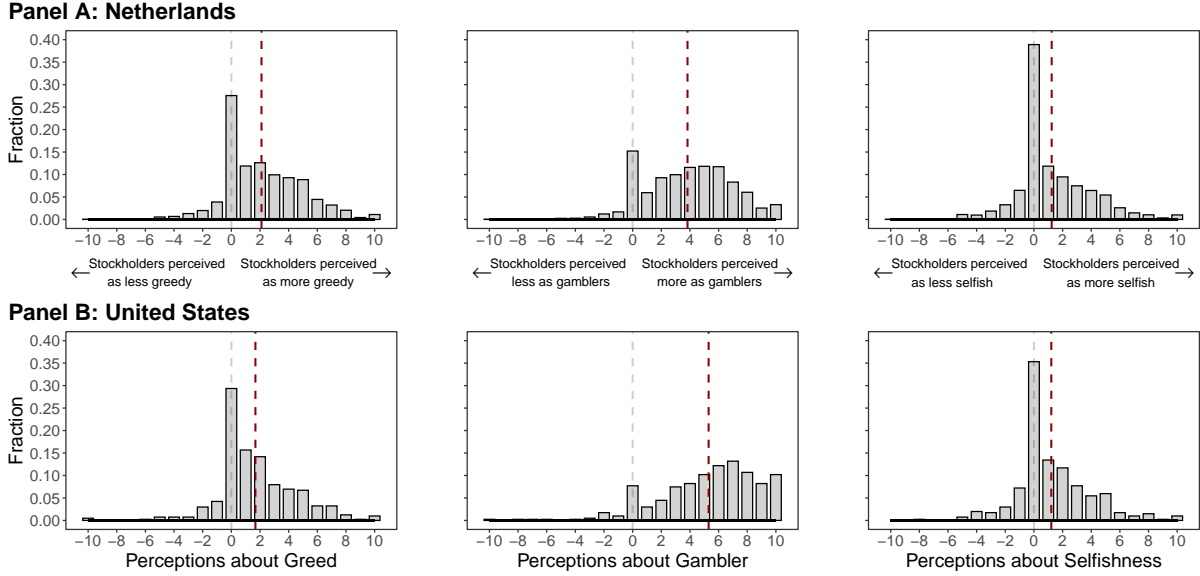
**Main results.** Figure 1 shows histograms for the difference between the assessments of stockholders and non-stockholders with respect to the three traits greed, gambler-type, and selfishness. Positive values indicate that subjects perceive stockholders more negatively relative to non-stockholders, and negative values the other way around. A value of zero indicates that subjects perceive no difference between the groups. Focusing on the Dutch sample in Panel A, a large fraction of subjects indeed perceives stockholders to be strictly more negative in terms of the traits (64% for greed, 81% for gambler, and 47% for selfishness, all three traits  $p < 0.001$ , Wilcoxon signed-rank test<sup>13</sup>). That is, they attribute higher values to stockholders than to non-stockholders when assessing the respective

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<sup>13</sup>We adjusted these p-values and the subsequent ones in this section for multiple hypothesis testing using Bonferroni correction. All tests refer to two-sided tests.

groups perceived greediness, likelihood of being gamblers and selfishness. While we also see a substantial share of individuals perceiving no difference, only a small minority classifies stockholders as less greedy, less likely to be gamblers, or less selfish. Moreover, the perceived differences between the two groups are highly correlated on the individual level and show a high degree of internal consistency (Cronbach's  $\alpha = 0.77$ ). Aggregating all three character traits, we observe that 81% of respondents have negative perceptions on average.

Figure 1: Difference in people's perceptions of characteristics of stockholders and non-stockholders



*Notes:* This figure displays histograms of the difference in perceptions of stockholders and non-stockholders, with higher values indicating that stockholders are perceived to be more greedy, gambler or selfish. Perceptions are elicited on a scale ranging from 0 to 10 for both groups. Panel A displays results for the Dutch sample ( $N = 3,272$ ) and Panel B for the US sample ( $N = 402$ ). The red dotted line displays the mean difference.

Turning to Panel B of Figure 1, we also find that a large fraction of US subjects perceive stockholders more negatively than non-stockholders. This holds true for each individual trait (60% for greed, 88% for gambler, and 50% for selfishness, all three traits  $p < 0.001$ , Wilcoxon signed-rank test) and in the aggregate, where we find that 86% of subjects have average negative perceptions. Similarly, answers were highly correlated on the individual level and consistent (Cronbach's  $\alpha = 0.67$ ). In fact, we observe the distribution of perceptions to be quite similar between the US and the Netherlands. However, note that our datasets are not suited for a comparison of perceptions between countries. Due to the differences in sampling (representative vs. convenience sample), the two samples are not directly comparable, and we abstain from further interpreting cross-country similarities. The intention of this section is instead to investigate whether negative perceptions exist in both countries, for which we find strong evidence.

**Robustness.** So far, we elicited perceptions directly over character traits using Likert-type scales, which were negatively framed. A potential concern is that our finding of large negative perceptions of stockholders is an artifact of the way perceptions were measured. To show that our finding holds independently of the methods employed, we collected additional data ( $N = 1,016$ ), in which we varied (1) outcomes, (2) scales, and (3) framing. Instead of directly asking for perceptions of charac-

ter traits as outcome variables, we elicited subjects' perceptions over behavior. To do so, we selected eight behavioral activities or events that are reasonably related to the previously used character traits (e.g. doing voluntary work or having lost money in the casino). For each, we asked subjects to estimate the proportion of people who engaged in the activity (0-100%). As before, subjects estimated the proportion separately for stockholders and non-stockholders and we use the difference in proportions as our negative perception measure. To vary framing, we deliberately used both positively and negatively described activities. See Appendix D for the full list of activities and a detailed description of the additional surveys.

For each of the eight activities, we can replicate our main finding: subjects view stockholders significantly more negatively or less positively, respectively (for each activity,  $p < 0.001$ , Wilcoxon signed-rank test). For example, 75% of subjects think that stockholders are strictly less likely to have done voluntary work and 71% think that stockholders are strictly more likely to have lost money in a casino. In fact, for all positively described activities, a majority of subjects estimate that fewer stockholders engage in it while for all negatively framed activities, a majority expects that more stockholders do so (see Appendix Figure D.2).

We also elicited subjects' perceptions over behavior using an allocation game as neutral frame. Subjects were presented with a situation where participants of a survey are provided with an endowment of money, which they can freely distribute between themselves and charity. Subjects also learned that a subset of participants would get their decision implemented with real consequences. We then asked subjects, separately for the groups of stockholders and non-stockholders, to estimate the proportion of the endowment that is donated. Again, we see large negative perceptions of stockholders. On average, subjects believe stockholders to donate 10 percentage points less of their endowment to the charity compared to non-stockholders ( $p < 0.001$ , Wilcoxon signed-rank test). In total, 58% of subjects believe that stockholders would donate strictly less than non-stockholders (see Appendix Figure D.3).

All in all, using different samples from two distinct countries and a variety of measures, we conclude that a large fraction of people associate stockholders with negative character traits.

### 3.4 Accuracy and determinants of perceptions of stockholders

In this section, we examine potential sources of the observed heterogeneity in perceptions. We start by asking whether the documented negative perceptions of stockholders are based on accurate or stereotypical beliefs, i.e., overly negative representations of reality. To assess their accuracy, we compare actual differences between stockholders 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 greedy, gambler, and selfish (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 1. Stockholders rate themselves on average as being significantly more greedy, selfish, and as gamblers compared to non-stockholders ( $p < 0.001$ , Wilcoxon signed-rank test).

Table 1: Comparison of average actual and predicted differences

	Greed	Gambler	Selfishness
Panel A: Actual average 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 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.

**Predicted differences.** We measure predicted differences by asking the same 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.<sup>14</sup> Panel B of Table 1 shows the results. While subjects are, on average, quite close to the true average for non-stockholders, they systematically overestimate the answers of stockholders. Actual differences are significantly exaggerated, ranging from 9% for selfishness to nearly 120% for gambler-like (Panel C). Thus, subjects in our representative sample of Dutch financial deciders 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 highly representative of greedy individuals, leading them to (vastly) overestimate the existing group differences.<sup>15</sup>

We indeed find evidence for the explanation proposed by the stereotypes model. While average differences are quite small, we find them 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.12).

<sup>14</sup>In contrast, the negative perception measure of Section 3.1 concerns subjects’ personal opinions of stockholders and non-stockholders. While we believe opinions are more relevant for subjects’ decision-making than predictions, we cannot directly compare them to objective differences between the two groups.

<sup>15</sup>We believe this explanation to be intuitively compelling in our context because a small subclass of stockholders, namely traders and investors, is the main focus of popular media’s display of stockholders. These individuals are usually painted as extremely greedy, selfish, and gambler-type. Consequently, people might view them as being representative of stockholders in general and form negative perceptions of the entire group of stockholders.

At the same time, there is almost no difference between the groups among the moderately greedy, gambler, and selfish (1-3 on the 10-point scale) subjects.

**Validation.** In order to show that the previous results extend beyond self-assessments, we employed a behavioral measure in our US sample. We asked stockholders and non-stockholders on Prolific to allocate 100€ between themselves and a charity and a separate sample to predict the resulting difference in donation behavior between the two groups.<sup>16</sup> 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.12). In line with the stereotypes model, we find a large exaggeration of the true difference. On average, subjects believed stockholders donate 15 percentage points less, more than twice the actual difference.

**Relation to stock market knowledge and numeracy.** People's perceptions of stockholders are conceptually different from their knowledge of the stock market. To test whether perceptions are also empirically distinct, we use our LISS panel sample of non-stockholders. For these 1,592 subjects, we collected one item capturing self-assessed knowledge, one question assessing actual knowledge of the stock market by asking about the fraction of Dutch citizens owning stocks and a standard measure of financial numeracy. We further collected subjects' self-assessed ability to be successful in the stock market and their belief over stock returns (see Appendix H for details on the variables).

We find low correlations between these measures and the extent to which subjects view stockholders negatively. Self-assessed stock market knowledge ( $r = -0.13$ ) and success ability ( $r = -0.07$ ) are not meaningfully correlated with people's views of stockholders. Neither is financial numeracy ( $r = 0.12$ ), return beliefs ( $r = 0.06$ ), or subjects' answers to the knowledge question about the fraction of stockholders in the population ( $r = 0.03$ ).<sup>17</sup> Consequently, these results support the notion that people's views of stockholders are distinct from their knowledge of the stock market itself.

**Determinants of negative perceptions.** Finally, we investigate socio-demographic and behavioral predictors of negative perceptions of stockholders. Using the LISS sample, we regress average negative perceptions on a rich set of background variables (for details, see Appendix Table B.10). We find that females have significantly higher negative perceptions than men, but observe no effect of education, wealth, or age. Furthermore, we observe a strong impact of political ideology. Subjects who assess themselves as belonging to the left political spectrum hold significantly higher negative perceptions than subjects belonging to the political center.

A potential source of heterogeneity in negative perceptions is that people receive different information on the characteristics of stockholders and non-stockholders. Within the set of non-stockholders, we investigate the behavioral foundations of this channel. Consistent with the idea that stockholders are often negatively described in the media, we find that subjects reporting to be very interested in

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<sup>16</sup>Note that we defined the groups to subjects making the predictions in terms of the target population. In the Netherlands, subjects were asked about the general adult Dutch population that are financial deciders (our LISS sample). In the US, subjects were asked about people residing in the US that participate in surveys on Prolific (our US sample).

<sup>17</sup>While subjects have large misperceptions about stockholders, their beliefs about stock returns and the fraction of people owning stocks are not systematically biased. On average, subjects' return beliefs are well-calibrated to historical returns. Similarly, the average belief about the fraction of stockholders in the population is only 3 percentage points higher than the actual fraction.



the news have significantly higher negative perceptions of stockholders. In addition, we find that the more subjects agree with the statement “Money is not something you should talk about”, the higher their negative perceptions. These findings suggest that information disseminated through the media increase negative perceptions, while information disseminated through social interactions decrease them.

## 4 The relationship between perceptions of stockholders and financial decision-making

This section investigates how people’s perceptions of stockholders influence financial decision-making. Our conceptual framework described in Section 2 makes two key predictions on how perceptions shape decisions, which we test in two experiments. The next section describes the design of an experiment to test Prediction 1, with the results provided in Section 4.2. Section 4.3 presents an experiment to test Prediction 2, with its results shown in Section 4.4. Lastly, Section 4.5 provides experimental evidence on the effectiveness of a policy-oriented intervention to change individuals’ investment behavior whose design is motivated by our framework. We preregistered all experiments in this section. See Appendix G for details and documentation of any deviations from the preregistration.

### 4.1 Description experiment

Section 3 provided evidence that people perceive stockholders differently than non-stockholders with respect to identity-relevant characteristics. Given this result, our framework makes the following prediction: whether an action is associated with the stock market, and hence with the group of stockholders, influences people’s decision-making, independent of outcomes (Prediction 1). We test this prediction by presenting subjects with simple incentivised investment decisions, for which we exogenously vary the options’ association with the stock market.

**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. The price and outcomes of the risky option vary between the four decisions of each part.

**Descriptions.** To vary the association of the decisions with the stock market, we use two different ways to describe the risky and safe options to subjects.<sup>18</sup> In the treatment *Stock Description*, the risky option is described as a bet on past stock market prices. Subjects are told that they could buy one

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<sup>18</sup>Liberman, Samuels, and Ross (2004) as well as Ellingsen et al. (2012) use labeling manipulations to show that describing a prisoner’s dilemma as a Wall Street/Stock Market Game instead of a Community Game reduces cooperative behavior. Relatedly, labeling a matched player in the trust game as partner or opponent (Burnham, McCabe, and Smith, 2000) and a dictator game’s decision as taking or allocation decision (List, 2007; Bardsley, 2008; Cappelen et al., 2013) influences prosocial behavior.

share of an (actual, existing) ETF<sup>19</sup> at a price that the ETF had traded at a specific point of 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 value of the ETF at the selected selling date as payment (receive  $x_h$  or  $x_l$ ). The safe option is described as abstaining from betting on the stock market (receive the endowment with certainty). See the first column of Table 2 on how the options were introduced to subjects and an example of the decision described as a stock investment.

In the treatment *Draw Description*, all references to the stock market are replaced by neutral wording. The risky option is described as a bet on the outcome of a random draw. Instead of an ETF share, subjects could buy 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 (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). See column 2 of Table 2 for illustration.

While our stock decisions do not exactly represent real-world investments, they nevertheless retain the element of betting on the value of an index traded on the stock market. Therefore, we find it plausible that the decision to invest in the *Stock Description* is, to a higher degree, associated with the group of stockholders than the decision in the *Draw Description*. Indeed, we show in Appendix E that stockholders are 50% more likely to invest in the stock investment compared to non-stockholders.

Importantly, the treatments vary only in how the options are described: subjects faced the same buying prices  $c$  and outcomes  $x_l$  and  $x_h$ , independently of the description. Because the potential outcomes and winning probabilities are identical, outcome-based theories of decision-making predict no difference between descriptions. Furthermore, we designed the descriptions to be as similar as possible in terms of complexity and length. To further reduce the scope for misunderstandings between descriptions, we gave subjects the respective expected value of the risky option. Subjects were thus able to easily compare expected payments between risky and safe options.

**Between-subject variation.** For the first decision part, we randomly assigned subjects either to treatment *Draw Description* (where options are described neutrally), or to treatment *Stock Description* (where options are described as stock investments). Comparing choices between treatments thus identifies the effect of varying the association of the options with the stock market.

**Within-subject variation.** After the first decision part, subjects answered a couple of general demographic questions intended as filler questions and subsequently faced the second decision part.<sup>20</sup> Here, subjects again make four decisions. Subjects who received the *Stock Description* before subsequently receive the *Draw Description*, and vice versa. This variation allows us to investigate preferences on the individual level since we observe the same subjects making choices under the different descriptions. In order to avoid consistency effects<sup>21</sup>, we obfuscate that the values of the options are

<sup>19</sup>We used year-end share prices of the following four ETF's: iShares Nasdaq 100, MSCI World iShares, iShares MSCI EM and Invesco FTSE RAFI US 1000.

<sup>20</sup>In the first decision part, subjects were not aware that a second decision part would follow.

<sup>21</sup>Subjects could be motivated to choose the same options across decision parts because they want to appear congruous in their choice behavior (Falk and Zimmermann, 2017). This behavior would mitigate the within-subject influence of the descriptions. Naturally, it cannot play a role in the between-subject comparison.

Table 2: Descriptions of the Options

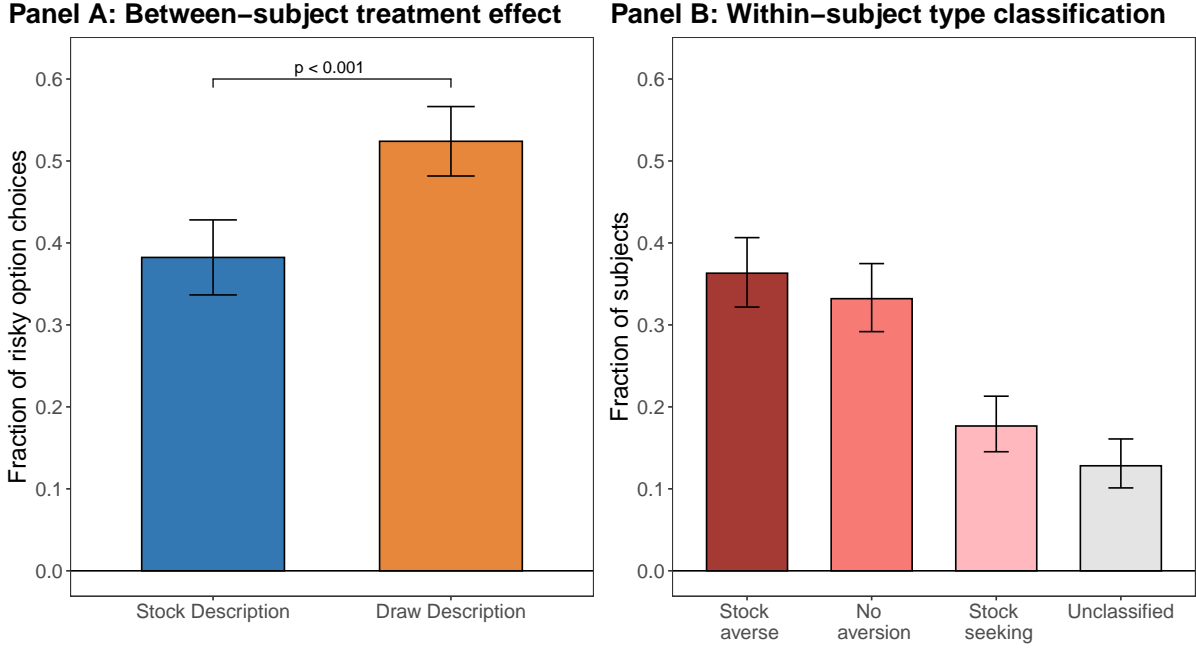
Stock description	Draw description																
<p>In this section, you will make four decisions. In each decision, you will separately receive \$30 from us. With this money, you can choose between two options:</p> <p>Option A: Participate in the <b>stock market</b> by buying a <b>share</b>. The value of the <b>share</b> depends on the <b>movement of the stock market</b>.</p> <p>Option B: Do not participate in the <b>stock market</b>.</p> <p>In each decision, you will have the option to buy a different <b>share</b>. Each <b>share</b> has a different price and offers different <b>returns</b>.</p>	<p>In this section, you will make four decisions. In each decision, you will separately receive \$30 from us. With this money, you can choose between two options:</p> <p>Option A: Participate in a <b>random draw</b> by buying a <b>ticket</b>. The value of the <b>ticket</b> depends on the <b>outcome of the random draw</b>.</p> <p>Option B: Do not participate in the <b>random draw</b>.</p> <p>In each decision, you will have the option to buy a different <b>ticket</b>. Each <b>ticket</b> has a different price and offers different <b>prizes</b>.</p>																
<p>Example of Option A:</p> <table> <tr> <th></th><th>Share Price MSCI World ETF</th></tr> <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> </table>		Share Price MSCI World ETF	2010 (Buying Price)	\$27.19	2011	\$25.06	2016	\$37.21	<p>Example of Option A:</p> <table> <tr> <th></th><th>Prize</th></tr> <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> </table>		Prize	Buying Price	\$27.19	Outcome 1	\$25.06	Outcome 2	\$37.21
	Share Price MSCI World ETF																
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2016	\$37.21																
	Prize																
Buying Price	\$27.19																
Outcome 1	\$25.06																
Outcome 2	\$37.21																

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. Figure A.1 in the appendix displays the four possible visualizations. The visualization and currency used for each decision part is randomized on the subject level independently of the description.

**Procedure.** 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 (by picking different selling years for the stock option). Subjects who reveal a high degree of risk averse behavior during the initial two questions receive more favorable risky options later, which reduces the fraction of subjects that either always pick the safe option or the risky option in all decisions. This procedure thus increases the power of our experimental comparison, but is independent of treatments, ensuring that the outcomes of the draw and stock options were identical as previously described.

**Sample and incentives.** 651 subjects on Prolific with residence in the US completed the experiment. See Appendix Table B.2 for sample demographics. The median completion time was slightly above 7 minutes, and subjects received £0.9 ( $\approx$  \$1.13) for completion. Additionally, ten randomly selected subjects had one of their decisions implemented with real consequences. In total, the average payment was £1.38 per subject ( $\approx$  \$14.80 per hour), which is well above the US federal minimum wage level. In accordance with the preregistration, we exclude 136 subjects who indicated that they own risky financial assets, where we used the same definition as in Section 3.1. Our main sample thus consists of 515 subjects.

Figure 2: Description experiment results: aggregate and individual behavior



Notes: **Panel A** displays the between-subject treatment effect of the description experiment. The outcome variable denotes the average fraction where the risky instead of the safe option is chosen. *Stock Description* denotes the treatment in which the risky option is described as a stock investment and *Draw Description* the treatment in which the option is described as a random draw. **Panel B** displays the distribution of types identified by the within-subject analysis. Subjects are *stock averse* if they weakly prefer the risky option described as a random draw to the risky option described as a stock investment, with at least one strict preference for the risky option described as a random draw. Subjects are *stock seeking* if they weakly prefer the risky option described as stock to the draw one, with at least one strict preference for the risky option described as a stock investment. Subjects show *no aversion* if they consistently choose the same option between descriptions. Remaining subjects that do not show a consistent choice pattern are labeled *unclassified*. Errors bars indicate 95% confidence intervals.

## 4.2 Description experiment results

**Between-subject analysis.** In total, 260 subjects were part of the *Draw Description* treatment and 255 were part of the *Stock Description* treatment. Appendix Table B.3 shows that treatments were balanced across demographic variables. Panel A of Figure 2 displays the treatment effect on decision-making. We find that subjects in the *Draw Description* 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 Description* treatment choose the risky option in only 38% of decisions. Hence, once the risky option is described as a bet on the stock market instead of a bet on a random draw, subjects are 27% less likely ( $p < 0.001$ , Wilcoxon signed-rank test) to choose the option, even though the values underlying the option are identical.<sup>22</sup> Panel A of Appendix Table B.4 provides complimentary regression results. In the table, we pool decisions and regress a dummy indicating if the risky option was chosen on a dummy indicating the *Stock Description* treatment. The regression confirms a large and significant treatment effect. Notably, we find that while only 19% of subjects never choose the risky option within the *Draw Description* treatment, this fraction almost doubles to 36% in the *Stock Description* treatment.

<sup>22</sup>Reassuringly, neither the form of visualization ( $p = 0.83$ , Wilcoxon signed-rank test) nor the currency ( $p = 0.85$ , Wilcoxon signed-rank test) had any effect on how often the risky choice is chosen.

**Within-subject analysis.** For the within-subject analysis, we use the choices of both decision parts. We find that the within-subject effect is very similar to the between-subject effect. While subjects choose the risky option in 50% of decisions when described as a bet on a random draw, this fraction decreases to 38% when described as a bet on stock market movements. Panel B of Table B.4 in the Appendix shows the corresponding regression results. We again find a significant effect that is robust to the inclusion of demographic controls.

Utilizing the fact that we observe subjects’ choice behavior under both descriptions, we can categorize subjects into distinct behavioral types. We define subjects as *stock averse* if they weakly prefer the risky option described as a random draw to the risky option described as a stock investment, with at least one preference being strict. A preference being strict means choosing the risky option under the draw description and the safe under the stock description. Accordingly, subjects are *stock seeking* if they weakly prefer the risky option described as stock to the draw one, with at least one strict preference. Subjects show *no aversion* if they consistently choose the same option between descriptions. Remaining subjects are labeled *unclassified*<sup>23</sup>. Figure 2 displays the distribution of types. In total, 36% of subjects are *stock averse*, 18% are *stock seeking*, 33% display *no aversion*, and the remaining 13% show no consistent preferences across descriptions (*unclassified*).

In summary, the description experiment reveals a strong aversion against a choice option if it is associated with the stock market – even if we hold any other aspect of the choice option constant. Hence, we can confirm Prediction 1 of our model.

### 4.3 Information experiment

Next, we examine whether subjects’ negative perception of stockholders is the mechanism driving the stock market aversion documented in the last section. To this end, we test Prediction 2 of our framework and design an experiment in which we exogenously shift subjects’ perceptions of stockholders. To cleanly identify the causal effect of varying perceptions on financial decision-making, we again make use of the controlled decision environment of the previous experiment. Our main outcome variable is subjects’ willingness to invest in the risky option described as a stock investment. Before this decision, 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, Bracha, and Meier, 2009; Grossman and van der Weele, 2017; Bénabou et al., 2022). Therefore, we expect this information to shift subjects’ perceptions of the difference in the traits of selfishness and greed between stockholders and non-stockholders.

**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 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. Allocators consisted of both stockholders and non-stockholders.

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<sup>23</sup>These subjects choose the risky option in some decision under the stock description and the safe option under the draw description, and the other way around in other decisions.

**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.<sup>24</sup> 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].” See Appendix Figure A.2 for a screenshot. Consequently, some subjects receive the information that stockholders donated more than non-stockholders, while others learn that in their draw non-stockholders donated more with different percentage differences. To ensure that subjects paid attention, they had to repeat the information on the subsequent page.

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. Additionally, because outcomes and probabilities are clearly stated in our decision framework, all relevant factors of the investment decision are known to subjects. Therefore, even if subjects for some reason update factors unrelated to their perceptions of stockholders, we see no reason that such secondary updating would influence decision-making in our experiment. We are, hence, confident in assuming that outcome-based utility  $u_i(z_I)$  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  $\hat{\mathbb{E}}_i [q^i | S] - \hat{\mathbb{E}}_i [q^i | NS]$ .

**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;<sup>25</sup> second, the full signal as continuous variable where higher values are associated with signals that the selected stockholders donated more relative to the non-stockholders.

**Procedure.** At the start of the experiment, subjects made two calibration choices and then 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 related setting as a control when analyzing the effect of the information, increasing statistical power. Subjects subsequently state their prior belief over the difference in donation behavior between stockholders and non-stockholders, and then receive the signal about the difference in donation behavior. After receiving this information, subjects made four incentivised decisions between a safe option and a risky option described as a stock investments (again in the same way as explained in Section 4.1).

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<sup>24</sup>They were also informed about the relationship between behavior in the donation decision and other relevant real-life behavior. For example, we explained that previous 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).

<sup>25</sup>In total, less 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 altogether from the analysis.



Table 3: Information experiment treatment effect on negative perceptions

	<i>Dependent variable: Negative perception over</i>		
	Selfishness (1)	Greed (2)	Gambler (3)
Signal over donation behavior	−0.190*** (0.034)	−0.150*** (0.033)	−0.049 (0.031)
Constant	1.516*** (0.132)	1.963*** (0.130)	5.010*** (0.152)
Prior beliefs	X	X	X
Observations	548	548	548
R <sup>2</sup>	0.071	0.053	0.028

*Notes:* The table displays OLS-estimates. The dependent variable is the difference in perceptions between stockholders and non-stockholders, with higher values indicating that stockholders are perceived to be more selfish in column (1), greedy in column (2) and gambler in column (3). Signal over donation behavior 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. That is, a one unit increase means a signal that stockholders donate 10% more than non-stockholders. Prior beliefs is subjects belief over the differences in donation behavior between stockholders and non-stockholders. Robust standard errors in parentheses. Significance levels are \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

Finally, we elicited subjects’ perceptions of stockholders and non-stockholders (posterior belief) using the module explained in Section 3.

**Sample and incentives.** 652 subjects on Prolific with residence in the US completed the experiment. See Appendix Table B.2 for sample demographics. Median completion time was 9.5 minutes and subjects received £1.2 for completion. Additionally, ten randomly selected subjects had one of their decisions implemented with real consequences. In total, average payment was £1.71 per subject ( $\approx$  \$13.50 per hour). In accordance with the preregistration, we exclude 104 subjects who indicated that they own risky financial assets.

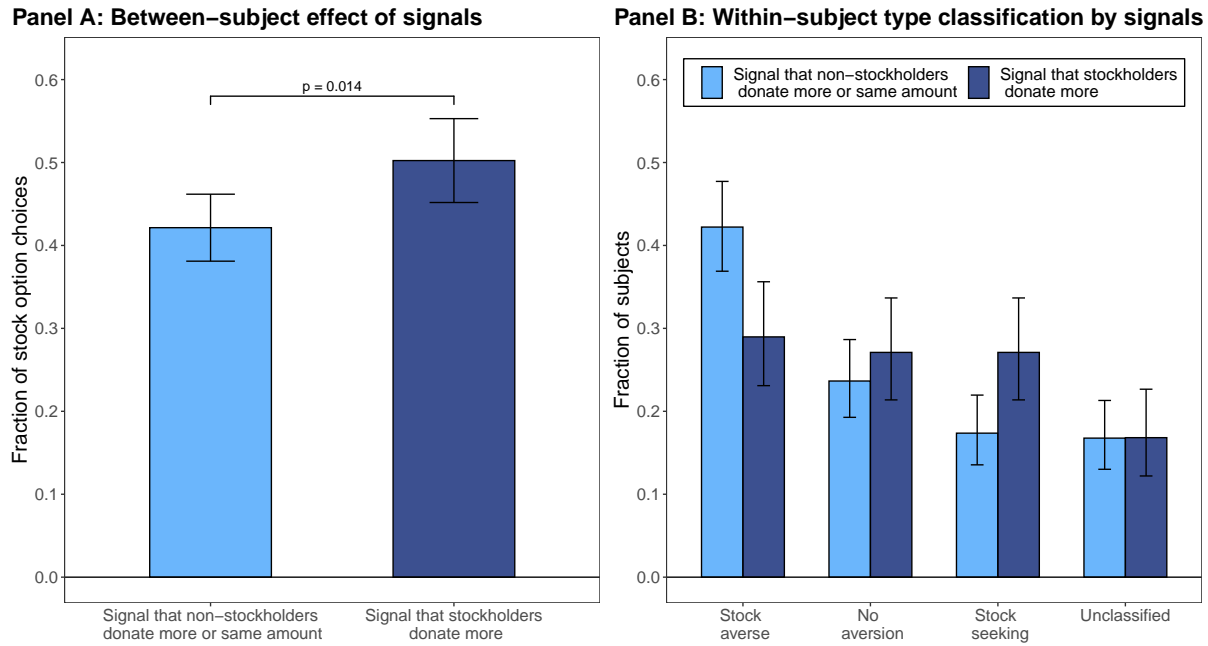
#### 4.4 Information experiment results

**Signal distribution and prior beliefs.** In total, 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.3 for the whole distribution. Replicating the results of Section 3, we find that prior to receiving the actual difference, subjects believe the randomly selected group of stockholders donate 15 pp. less than the group of non-stockholders. Appendix Figure A.4 displays the distribution. Reassuringly, prior beliefs were not correlated with the randomly generated signal ( $r = 0.01, p = 0.89$ ). Table B.5 in the appendix 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 perceptions of differences in selfishness (column (1)) and greed (column (2))

between stockholders and non-stockholders on the signal about the difference in donation behavior between both 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 the perceptions on the trait "gambler" (column (3)), which is reassuring as the information provided was not related to this trait.

Figure 3: Information experiment results: aggregate and individual behavior



**Notes:** **Panel A** displays the effect of varying the signal in the information experiment. The outcome variable denotes the average fraction that the risky option described as a stock investment instead of the safe option is chosen. The left bar displays the choice behavior of subjects who received a signal that non-stockholders donated more or the same amount compared to stockholders. The right bar displays behavior for subjects who received a signal that stockholders donated more than non-stockholders. **Panel B** displays the distribution of types identified by the within-subject analysis. Subjects are *stock averse* if they weakly prefer the risky option described as a random draw to the risky option described as a stock investment, with at least one strict preference for the risky option described as a random draw. Subjects are *stock seeking* if they weakly prefer the risky option described as stock to the draw one, with at least one strict preference for the risky option described as a stock investment. Subjects show *no aversion* if they consistently choose the same option between descriptions. Remaining subjects that do not show a consistent choice pattern are labeled *unclassified*. Errors bars indicate 95% confidence intervals.

**Effect on behavior.** Our main variable of interest is subjects' likelihood of choosing the stock option. Panel A of Figure 3 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 increases to 50% for those subjects who learn that stockholders donated more ( $p = 0.014$ , Wilcoxon signed-rank test). In Panel B of Figure 3, 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.<sup>26</sup> At the same time, the fraction of unclassified subjects is not

<sup>26</sup>Similarly, 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).

Table 4: Information experiment treatment effect on decision-making

	<i>Dependent variable:</i>	
	Choice of stock option	
	(1)	(2)
Signal over donation behavior	0.009** (0.004)	0.009** (0.004)
Choice of draw option	0.239*** (0.025)	0.240*** (0.025)
Mean dep. variable	0.45	0.45
Demographic controls		X
Prior beliefs	X	X
Subjects	548	541
Observations	2,192	2,164

Notes: The table displays OLS-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. “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 risky option is chosen when described as a random draw investment. “Prior beliefs” refers to subjects’ belief over the difference in donation behavior between stockholders and non-stockholders. “Choice of draw option” and “Prior beliefs” are both elicited before subjects receive the signal. Demographic controls include age, gender, education, income, total financial assets and involvement in financial decision-making. Standard errors (in parentheses) are clustered at the subject level. Significance levels are \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

affected by the information. Therefore, we obtain causal evidence that information about differences in donation behavior influences stock investment behavior.

In Table 4, 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 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 signals 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.).

In Appendix Section F, we investigate whether subjects’ reaction to the signal is asymmetric relative to their prior belief. We find that the effect of information provision on behavior is stronger among subjects receiving positive information about stockholders than among those receiving negative information of the same magnitude.

Table 5: Information experiment causal effect of negative perceptions on decision-making

	<i>Dependent variable:</i>			
	Choice of stock option			
	(1)	(2)	(3)	(4)
Negative perception over greed	−0.161** (0.075)	−0.165** (0.075)		
Negative perception over selfishness			−0.135** (0.061)	−0.140** (0.062)
Choice of draw option	0.233*** (0.026)	0.233*** (0.026)	0.235*** (0.025)	0.234*** (0.026)
Mean dep. variable	0.45	0.45	0.45	0.45
F-statistic first stage	21.01	21.26	32.24	32.16
Demographic controls		X		X
Prior beliefs	X	X	X	X
Subjects	548	541	548	541
Observations	2,192	2,164	2,192	2,164

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 columns (1-2) “Negative perception over greed” and in (3-4) “Negative perception over selfishness”. Both denote difference in perceptions between stockholders and non-stockholders, with higher values indicating that stockholders are perceived to be more selfish (1-2) and more greedy (3-4). “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 financial decision-making. Standard errors (in parentheses) are clustered at the subject level. Significance levels are \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

**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 indicated in Table 3, we have a strong first stage. For the two treated traits of greed and selfishness, the respective F-statistic are 21.01 and 32.24. Table 5 displays the results of the 2SLS-regressions. Columns (1) and (2) focus on negative perceptions of greed. 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. Columns (3) and (4) reveal that when focusing on perceptions of stockholders’ selfishness, the effect is also statistically significant and very similar. We further find that both effects are stronger than the reduced form effects obtained by regressing the likelihood of investing in the stock option on negative perceptions of greed and selfishness. In these specifications capturing the correlational effect, a one standard deviation increase in negative perceptions is associated with a 5 pp. decrease in subjects’ likelihood to choose the stock option.

**Follow-up survey.** We designed a follow-up survey to (1) address the concern that experimenter demand effects drive our results, (2) assess the persistence of our effects on perceptions, and (3) 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. However, since our primary outcome is incentivized, previous literature suggests that demand effects are unlikely to drive our results.<sup>27</sup> Nevertheless, to address this concern in the context of our study, we obfuscated the follow-up survey. 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 is successful, demand effects cannot drive effects found in the follow-up study.

Accordingly, two days after conducting the main experiment, we fielded another study via Prolific. We invited only subjects of the main experiment, utilizing that subjects on Prolific regularly receive survey invitations. Compared to the main experiment, we altered the study description, visual style, responsible researcher and institution.<sup>28</sup> Thus, the studies appeared to subjects as fully distinct. We also embedded our variables of interest within a battery of questions on other topics. In particular, we asked subjects about their intentions regarding specific behaviors in the future. For instance, we asked subjects about their intention to engage in more environmentally friendly behavior or to buy disability insurance (7-point Likert scale). Among this set of questions, subjects could state their agreement on whether they will, under no circumstances or situations, invest any of their money into the stock market in the next five years.<sup>29</sup> This is our main variable of interest, with which we measure whether the information led to a change in subjects' investment intentions.

Additionally, we wanted to investigate whether the information also leads to persistent changes in perceptions of stockholders. To do so, we asked subjects how selfish they view non-stockholders compared to stockholders on a scale from 1 to 9. Again, this question was embedded in a larger battery of questions asking subjects about different groups and personality traits, so that our variable of interest appeared to subjects as one of many variables.

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.<sup>30</sup> Between the main experiment and the follow-up survey, subjects completed, on average, 15 other studies. Together with the measures we took to obfuscate the follow-up, it seems highly unlikely that subjects perceived a connection between the main experiment and follow-up. This is further supported by the fact that 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?". We also asked subjects to indicate the number of similar studies they had completed in the past two weeks. In total, 82% of subjects answered with

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<sup>27</sup>Experimental evidence shows that demand effects often have little impact on responses (De Quidt, Haushofer, and Roth, 2018) 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).

<sup>28</sup>For the main experiment, we used the first-author as responsible researcher and thus the University of Bonn as institution, for the follow-up, we used the second author and hence the IZA.

<sup>29</sup>We used this formulation of investment intention to retain variation in answers given the strong opposition to the stock market in our sample.

<sup>30</sup>We 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 between samples, see Appendix Table B.6.

“none”, further indicating that we successfully created a survey that was perceived being distinct from the main study.<sup>31</sup>

We find that subjects who received information that stockholders donated more for a good cause are significantly more willing to consider investing in the upcoming years ( $p = 0.020$ , Wilcoxon signed-rank 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 signed-rank test). Table B.7 in the appendix shows these effects using an OLS regression, controlling for prior beliefs. Reassuringly, we find no effect of the information on the other variables of the survey, which can be seen as a placebo test. Appendix Figure A.5 displays the results of this placebo test for intentions and Figure A.6 displays the results for perceptions. We find slightly weaker but still persistent and significant effects when we look at the full continuous signal variable, see Appendix Table B.8.<sup>32</sup>

In summary, our data confirm Prediction 2: perceptions about characteristics of stockholders causally change the attractiveness of choices associated with the stock market and influence subjects’ investment intentions.

## 4.5 Correcting stereotypical perceptions

While we designed the previous experiments to identify the causal effect of negative perceptions on investment behavior, in this section, we report the results of an experiment designed to assess the effectiveness of a debiasing intervention. Since subjects’ perceptions are overly negative, as shown in Section 3.4, providing them with information on the actual differences between stockholders and non-stockholders could be a natural policy intervention. Despite the documented relevance of perceptions in decision-making, based on the previous literature it is not obvious that such an 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, Miano, and Stantcheva, 2022). Moreover, direct attempts to correct people’s beliefs could even backfire, instead increasing stereotypes and animosities (Fouka, 2020).

**Design.** To investigate the effect of correcting people’s stereotypes about stockholders, we conducted an experiment with 1,596 non-stockholders of our LISS panel sample. 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 greedy, gambler, and selfish (1.17, 1.29, and 0.86 points, respectively, see Section 3.4). They also received complementary information on differences in activities related to these self-assessments. The other half received no information (control). Afterwards, we elicited subjects’ posterior negative perceptions and 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. For them, the money was invested in the

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<sup>31</sup>Our results are similar if we only consider these subjects in the analysis.

<sup>32</sup>A weaker effect compared to the binary classification of information seems plausible, because information on which group donated more is easier to memorize than the exact percentage difference.



savings account and/or the ETF for a year and paid out afterward. By comparing the treatment group with the control group, 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.

**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 signed-rank test). An important question, however, is how subjects that 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. This variable was elicited in a previous wave of the LISS panel and reveals subjects’ stereotypes about stockholders, see Section 3.4.<sup>33</sup> 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 signed-rank test). However, this average effect once again masks substantial heterogeneity. Since subjects with priors close to the actual differences are given information that confirms their beliefs, we would not predict changes in their investment behavior. Instead, the effect should be concentrated on subjects who receive information correcting their stereotypes. Using the same median split as before, Table 6 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.<sup>34</sup>

## 5 Implications of perceptions of stockholders

This section adds external validity and extends the scope of our analysis by including further relevant variables affected by negative perceptions of stockholders. In Section 5.1, we investigate the relationship between negative perceptions and actual stock market participation identified by administrative

<sup>33</sup>The 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 average perception measure defined in Section 3 or other splits yield similar results.

<sup>34</sup>We also elicited investment intentions both in the short run (six month) and long run (five years). In line with the strong stock market aversion documented previously, 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.

Table 6: Effect of providing information about true differences between stockholders and non-stockholders on investment behavior

	<i>Dependent variable: money invested in exchange-traded fund</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 the stock option instead of the safe option. Information treatment is an indicator variable equal to one if the subject receives information about the true differences between stockholders and non-stockholders in self-assessed greed, gambler, and selfishness and related activities and zero otherwise. Demographic controls include age, gender, education, income and total financial assets. Robust standard errors in parentheses. Significance levels are \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

records. In the following sections, we provide evidence that negative perceptions of stockholders predict attitudes and behavior beyond subjects' own financial decisions. They play a crucial role in people's affective polarization towards stockholders and their political attitudes towards financial markets (Section 5.2). Negative perceptions also predict subjects' misreporting of financial assets, as shown in Section 5.3. Lastly, we show that perceptions differ for different investment products in Section 5.4.

## 5.1 Actual stock market participation

In this section, we show that negative perceptions are (i) predictive of households' actual stock market participation among a representative sample of financial deciders and (ii) a quantitatively important determinant of stock market participation above and beyond leading alternative determinants proposed by the literature.

**Data and variables.** For the analysis we utilize two core features of the LISS panel. First, subjects' survey responses in the LISS panel can be linked to administrative records provided by Statistics Netherlands. For each subject that consented to the linkage (89% of our sample), we observe their respective households' financial asset allocation based on tax record data. Second, we utilize the panel structure of the LISS panel to obtain several preference and belief measures elicited in previous surveys. We focus on variables that the previous literature identifies as the most important predictors of households' portfolio choices. These variables are risk aversion, beliefs about stock returns, financial numeracy, general trust, ambiguity aversion, and likelihood insensitivity (full set available for 46% of our sample). We obtain measures of each variable using state-of-the-art elicitation methods; see Appendix H.3 for details.

Table 7: The relationship between negative perceptions and stock market participation

	<i>Dependent variable: Has risky financial assets</i>			
	Full sample		Determinants sample	
	(1)	(2)	(3)	(4)
Average negative perception	-0.058*** (0.007)	-0.052*** (0.007)	-0.054*** (0.010)	-0.043*** (0.010)
Risk aversion				-0.034*** (0.009)
Belief over positive stock returns				0.062*** (0.011)
Financial numeracy				-0.001 (0.010)
General trust				0.022** (0.009)
Ambiguity aversion				-0.021** (0.010)
Likelihood insensitivity				-0.022** (0.010)
Mean dep. variable	0.228	0.226	0.231	0.231
Demographic controls		X	X	X
Observations	2915	2903	1493	1493

*Notes:* The table shows OLS regression coefficients. The dependent variable is an indicator variable equal to one if the subject owns stocks and zero otherwise. “Average negative perceptions” is defined as the mean of the negative perceptions over the traits greed, gambler and selfishness, with higher values indicating that stockholders are perceived more negative. See Appendix H.3 for details on the other independent variables. All displayed independent variables have been standardized. Robust standard errors in parentheses. Controls include age, gender, education, income and total financial assets. Significance levels: \* $p < 0.1$ , \*\* $p < 0.05$  and \*\*\* $p < 0.01$ .

**Results.** We use a dummy variable indicating whether the household holds any risky financial assets and conduct a series of OLS-regressions displayed in Table 7.<sup>35</sup> Our main independent variable of interest is subjects’ average negative perceptions of stockholders compared to non-stockholders as defined in Section 3.1: the mean negative perception over the traits greed, gambler and selfishness<sup>36</sup>. All independent variables presented in the Table are standardized. Column (1) reveals that the more negatively subjects view stockholders compared to non-stockholders, the less likely it is that they possess risky financial assets themselves: an increase in negative perceptions by one standard deviation is associated with a drop in the 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, but still highly significant, when we control for a set of demographic variables (age, gender, education, income, and total financial assets).

<sup>35</sup>Probit regressions yield similar results, see Table B.13.

<sup>36</sup>Since perceptions are highly correlated between traits, we find similar results using perceptions of stockholders for each trait individually as independent variable.

In columns (3) and (4), we focus on the smaller sample of subjects for which we have measures of the additional variables that possibly influence portfolio choice. For each of the six other predictors of portfolio choice with the exception of financial numeracy, we can replicate the relationship with portfolio risk found by the previous literature.<sup>37</sup> The effect of negative perceptions is still substantial and significant. We find that a one standard deviation increase in perceptions is associated with a 4.3 percentage point decrease in the likelihood of owning risky financial assets. Perceptions are, therefore, among the strongest predictors. The coefficient's size is considerably larger than the coefficients of, for instance, risk or ambiguity aversion.<sup>38</sup> In Appendix Table B.9, we focus 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 are all associated with stock holding, our framework predicts that negative perceptions of stockholders should not play a role. Indeed, we find no significant relationship between the share invested in risky financial assets and negative perceptions of stockholders. At the same time, beliefs about stock returns and the degree of risk aversion remain important predictors.

Overall, we conclude that negative perceptions of stockholders are very robustly related to actual stock market participation. Moreover, the estimated effect size is large, also relative to the effect of other predictors.

**Heterogeneity.** Among which demographic groups is the effect of negative perceptions on stock-ownership concentrated? Interacting negative perceptions with the available demographic variables, we find that they are more strongly associated with stock-ownership among wealthy, male, educated and older households (see Figure A.7 in the Appendix for details). Interestingly, these groups also have a higher baseline likelihood to invest in risky financial assets.

## 5.2 Identification, affective polarization, and political attitudes towards stockholders

We look at three further implications of negative perceptions of stockholders in the sample of non-stockholders in the LISS panel. First, perceptions might be related to how strongly subjects identify themselves as non-stockholders. Second, they could drive affective polarization, i.e., animosities of non-stockholders towards stockholders. Third, they might shape political attitudes with respect to stockholders and the stock market.

**Identification with non-stockholder status.** To measure how strongly subjects who do not own stocks identify themselves as non-stockholders, we elicited five items that are based on established group identification scales (Doosje, Ellemers, and Spears, 1995; Klor and Shayo, 2010). Appendix Table H.1 shows the full list of items. We find evidence for widespread group identification, meaning that non-stockholders express a high degree of identification with their status as non-stockholders.

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<sup>37</sup>Without including other variables, financial numeracy significantly predicts whether households own risky financial assets. However, once we include demographics (particularly education) and the other variables in the regression, financial numeracy is no longer a significant predictor.

<sup>38</sup>A complementary approach to comparing the coefficients of the variables is to compare how well each variable explains variation in stock market participation. To do so, we apply the Shapley value method (Lipovetsky and Conklin, 2001). This method provides the marginal contribution of each independent variable in explaining variance in the dependent variable by aggregating the  $R^2$  of each possible combination of independent variables. The results further support the relevance of perceptions: with the exception of the return belief variable, perceptions explain the highest share of variance among the determinants presented in Table 7.

For example, about half of the participants agree with the statement that “Not having risky financial investments is an important part of my identity.” (i.e., they report at least 5 on a 7-point agree/disagree Likert scale) while 41% of the subjects report that they are “proud to not own risky financial investments”. We regress the mean of the five items of the identity scale on average negative perceptions in the first two columns in Table 8 (with both measures standardized). As expected, we find that negative perceptions strongly predict subjects’ group identification.

Table 8: Implications of negative perceptions on identification, in-group favoritism, and political attitudes

	<i>Dependent variable:</i>					
	Non-stockholder identification		Money allocated to non-stockholder		Support for higher taxation and regulation of stock market	
	(1)	(2)	(3)	(4)	(5)	(6)
Average negative perception	0.150*** (0.025)	0.140*** (0.024)	0.103*** (0.027)	0.086*** (0.026)	0.175*** (0.026)	0.150*** (0.023)
Moral universalism				−0.132*** (0.033)		
Support for wealth tax						0.420*** (0.027)
Left political spectrum						0.135** (0.057)
Right political spectrum						0.041 (0.059)
Opposition to income inequality						0.128*** (0.027)
Demographic controls		X		X		X
Observations	1,594	1,594	1,594	1,594	1,594	1,397
R <sup>2</sup>	0.022	0.143	0.011	0.063	0.031	0.307

*Notes:* The table displays OLS-estimates. The dependent variable in columns (1) and (2) is the mean of the five items of the non-stockholders identification scale, with higher values indicating a higher identification with the group of non-stockholders. In columns (3) and (4), the dependent variable is subjects’ behavior in an allocation game, with higher values indicating more money is allocated to non-stockholders and thus less to stockholders. In columns (5) and (6), the dependent variable is subjects’ mean answers on the five item scale capturing political attitudes towards stock market, with higher values indicating a higher support for taxation and regulation of the stock market and stockholders. “Average negative perceptions” is defined as the mean over the negative perceptions over the traits greed, gambler and selfishness, with higher values indicating that stockholders are perceived more negatively. See main text and Appendix H.5 for details on the other independent variables. All displayed independent variables have been standardized. Robust standard errors in parentheses. Demographic controls include age, gender, education, income and total financial assets. Significance levels are \*p<0.1; \*\*p<0.05; \*\*\*p<0.01.

**Affective polarization.** Based on this observation, a natural follow-up question is whether the strong negative perceptions and identification also translate into differential behavior towards stockholders, resulting in affective polarization due to in-group favoritism. Building on Enke, Rodríguez-Padilla, and Zimmermann (2022) and related work, we measure in-group favoritism using an allocation decision. We endow subjects with 100€, which they can freely distribute between two other participants of the LISS panel. They were informed that one participant is a stockholder and the other is a non-stockholder. We further inform them that both participants have a similar income and wealth

level. Since stockholders are, on average, wealthier than non-stockholders, this feature allows us to abstract from animosities towards individuals of higher status. This decision was incentivized, as for one randomly selected subject, the allocation decision was implemented with real consequences. To benchmark subjects in-group favoritism towards non-stockholders and control for general in-group tendencies, we subsequently employ the Moral Universalism short-scale (Enke, Rodríguez-Padilla, and Zimmermann, 2022) in the survey.

We observe substantial in-group favoritism among non-stockholder, resulting in strong discriminatory behavior against stockholders. Non-stockholders allocate, on average, 67.23€ out of the 100€ endowment to the recipient not holding stocks, which is more than double the amount allocated to the stock-holding recipient. This effect is even stronger than subjects' in-group favoritism towards individuals of their own nationality (compared to individuals living anywhere in the world), to whom they distribute, on average, 62.08€. Column (3) in Table 8 reveals that subjects' in-group favoritism towards non-stockholders is significantly influenced by their perceptions of stockholders and non-stockholders. An increase in negative perceptions by one standard deviation is associated with an increase in in-group favoritism towards non-stockholders of 0.1 standard deviations. Furthermore, column (4) shows that when controlling for several demographic variables and, in particular, their in-group favoritism along the other dimensions of the universalism scale (higher values indicate more universalism, i.e., less in-group favoritism), the relation remains largely unchanged. That is, even comparing subjects that show similar degrees of general in-group favoritism, we find a strong relationship between perceptions and preferred allocation to non-stockholders. Hence, elicited negative perceptions not only shape individuals' financial decision-making but are also significantly associated with their behavior towards stockholders.

**Political attitudes towards stock market.** Lastly, we examine the influence of perceptions on political attitudes. We measured subjects' support for five policy proposals concerning the taxation and regulation of stockholders and the stock market (using 7-point Likert scales). For example, we ask subjects whether they support the introduction of a financial transaction tax and whether the existing wealth tax in the Netherlands should be higher for investments in risky assets than for safe assets (Table H.2 in the Appendix reports the full list). We aggregate the items to obtain a measure for which higher levels indicate political preferences that are less favorable for stockholders in terms of regulation and taxation.

We find substantial variation in people's attitudes towards these policy proposals. For example, 45% support the introduction of a capital gains tax, while 21% oppose it. On average, 56% of subjects support the measures, while 31% oppose them. Importantly, differences in negative perception moderate these polarized opinions. As Column (5) in Table 8 shows, the more negatively subjects perceive stockholders, the more strongly they support policies that are less favorable for stockholders. In column (6), we control for several measures capturing subjects' general redistributive concerns. In particular, we elicited subjects' support for a general increase in wealth taxation (independent of asset classes), their self-reported political ideology (left, center, right) and opposition to income inequality. Negative perception remains a strong and significant predictor of support for policies favoring non-stockholders even when controlling for subjects' redistributive concerns.

Altogether, this section reveals important implications of widespread negative perceptions of stockholders. They result in subjects identifying more with their own group, favoring non-stockholders



over stockholders, and supporting policies that are less favorable towards stockholders.

### 5.3 Misreporting in surveys

As administrative data on wealth is not available in most countries, researchers often need to rely on self-reported asset data. Negative perceptions of stockholders could lead individuals to misreport having risky financial assets to avoid identity conflicts. Suppose, for instance, somebody has received stocks not by choice but through inheritance, a gift, or some company participation program. If this person perceives stockholders negatively, merely thinking about their stock-related assets might create disutility (Bénabou and Tirole, 2011). Moreover, reporting stock ownership in a survey makes the affiliation to this group explicit and "official" to the individual, which could create an identity conflict. Some might resolve this conflict by simply denying holding any risky financial assets.

**Measurement.** Since we observe both administrative and self-reported survey data, we can test whether negative perceptions predict directional misreporting. As described before, for each subject we observe their households' asset holdings identified through tax records. At the same time, the LISS panel surveys every adult member of the respective subject's household, and asks for their asset holdings. We aggregate reports on the household level to match administrative records.<sup>39</sup> Since the survey uses the same asset categories and subjects are asked to state the balance at exactly the same time point for which we have the administrative data balance, deviations are likely to be caused by misreporting.

**Aggregate results.** We first note that for 7% of the households, the dummy variable indicating if the household reports holding any risky financial assets in the LISS contradicts the respective variable in the administrative data. This result is in line with previous findings, which find substantial response errors in self-reported income and asset data (e.g. Hill, 2006; Meyer, Mok, and Sullivan, 2015; Bollinger et al., 2019). Importantly, the differences are asymmetric: 30% of households with risky assets do not report their holdings, while only 2% of the households without risky assets report having them. This leads to a severe under-reporting of risky assets. Based on the self-reported data only 16% of all households report holding any risky financial assets even though 21% actually own them based on administrative data.<sup>40</sup> At the same time, for those households that correctly report their stock-ownership status, there is no asymmetric misreporting in the share of assets invested in risky financial assets. While households on average invest 39% of their total financial assets in stock market related assets, their reported share is 40%.

**Predicting misreporting.** In Table 9, we show that negative perceptions of stockholders predict the documented under-reporting of risky financial assets. We focus on the subset of households that hold risky financial assets based on official data and use as the dependent variable an indicator of whether they (correctly) state that they hold them in the survey. As column (1) reveals, the higher a subject's negative perceptions, the more likely the subject self-reports that they do to hold any risky

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<sup>39</sup>Only the financial decider is asked to report assets jointly owned by the household which ensures that assets are not counted multiple times when we aggregate the individual data.

<sup>40</sup>The numbers in this paragraph are based on the sample of households (65 %) for which we observe self-reported asset data for all adult household members. In Table 9, we use the full set of households and add a dummy indicating whether we observe all household members as control variable.

financial assets. This effect is economically important: a one standard deviation increase in negative perceptions is associated with a more than five percentage point decrease in reporting ownership of risky assets. When we include demographic controls and financial numeracy in column (2), the coefficient is still on a similar level and statistically significant at the 10% level. The idea that subjects deny holding assets due to identity concerns would further predict no effect on the intensive margin of misreporting behavior. Indeed, when we focus on households that report having risky assets, we do not find a relation between the self-reported share of risky assets and perceptions about stockholders, controlling for the share of risky assets based on administrative data (see Appendix Table B.14 for the details). Thus, our results suggest that negative perceptions are not related to survey response error per se, but are related to misreporting due to identity concerns.<sup>41</sup>

Table 9: Misreporting of risky financial assets ownership

	<i>Dependent variable:</i> Reports having risky financial assets	
	(1)	(2)
Constant	0.519*** (0.035)	
Average negative perception	-0.051** (0.022)	-0.045* (0.025)
Financial numeracy		0.139*** (0.033)
Demographic controls		X
Observations	593	354

*Notes:* The table shows OLS regression coefficients. The dependent variable is a dummy variable equal to one if anybody in the household reports that they have any risky financial assets in the LISS panel. The sample is restricted to all households which hold any risky financial assets based on the Dutch administrative data. See Appendix H.3 for details on the other independent variables. All displayed independent variables have been standardized. Robust standard errors in parentheses. Controls include age, gender, education, income and total financial assets. Significance levels: \* $p < 0.1$ , \*\* $p < 0.05$  and \*\*\* $p < 0.01$ .

## 5.4 Perceptions over different investments

So far, we elicited negative perceptions of stockholders with a general definition of the group of stockholders – individuals that hold any type of risky financial assets. However, given the many different financial assets in this category, an interesting question is whether people differentiate perceptually between stockholders investing in different assets. To answer this questions, we focus on three important types of stock market related assets: (i) socially responsible investments (SRI), (ii) market index fund investments, and (iii) investments into financial derivatives (options, swaps, and warrants). We focus on the trait selfishness and asked 1,594 non-stockholders in the LISS panel to rate the group of individuals that (i) only invest in SRI assets, (ii) only invest in market index

<sup>41</sup>As placebo check, we investigated misreporting in house ownership. In total, 5% of households misreport whether they own a house or not. Based on our framework, negative perceptions of stockholders should not influence this type of misreporting, and we indeed find no empirical association.

funds and (iii) explicitly use derivatives. We elicited perceptions exactly as for the group of general stockholders (see Section 3.1).

We find that compared to general stockholders, the group of people that only hold SRI assets are seen as significantly less selfish ( $p < 0.001$ , Student's t-test, Bonferroni corrected). To a lesser but still significant degree, people only investing in market index funds are also perceived more positively than stockholders generally ( $p < 0.001$ ). In contrast, people that use derivatives are seen as more negatively, i.e., more selfish than stockholders ( $p = 0.017$ ). All three types of investors are still viewed as being significantly more negatively relative to non-stockholders ( $p < 0.001$ ). Although it represents only suggestive evidence, these findings provide a rationale for the high demand for mutual funds, particularly ETFs (Ben-David, Franzoni, and Moussawi, 2017), and socially responsible investments (see e.g., Hartzmark and Sussman, 2019) among retail investors.

## 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 fractions of individuals perceive stockholders negatively. We then show experimentally that these negative perceptions of stockholders causally influence people's decision-making and, using linked survey-administrative data, are an important predictor of actual stock market participation. Moreover, perceptions significantly contribute to affective polarization, political attitudes toward stockholders, and misreporting behavior in surveys.

Our results highlight limitations to the persuasive power of outcome-based strategies to influence households' financial decisions and offer perspectives on the design of alternative, potentially more effective strategies. Consider interventions aimed at increasing stock market participation or the effect of advertisements from brokers or banks on potential customers. Emphasizing the expected high returns of stock investments might have limited effects on households whose decisions are highly motivated by identity concerns because these concerns operate outside of the usual outcome-based economic logic. For the same reason, appeals to the skills and knowledge of financial experts might not convince identity-minded households to invest in stocks. Such strategies could even backfire if they reinforce the belief that the population of stockholders is fundamentally different than non-stockholders. Being confronted with individuals perceived as representative of selfish or greedy people could further support stereotypical views of the entire population of stockholders.

Instead, our results suggest that changing perceived differences between stockholders and non-stockholders has the potential to substantially influence investment behavior. As we have shown, providing subjects with information about differences in donation behavior between stockholders and non-stockholders changes the take-up of stock market related options. Broader interventions, such as providing detailed information about differences over a longer duration of time, could thus induce changes in households' actual stock market participation. In particular, combining the insights from our results and framework with concepts developed from research on inter-group relations (Böhm, Rusch, and Baron, 2020) may be very effective in reaching the group of identity-motivated households. For instance, "decategorization" is a strategy whose goal is to alleviate the belief that opposing groups form homogeneous units. Applied to the current context, it means highlighting that very different members of society invest in stocks. Another example is the concept of "recategoriza-

tion”, which proposes the communication of similarities and common goals between stockholders and non-stockholders.

Since we have documented that a substantial fraction of people holds stereotypical and thus biased beliefs regarding stockholders, normative arguments favoring such interventions can be made. This is a crucial factor distinguishing our explanation of limited participation from preference-based explanations. Not only are deeply held preferences hard or even impossible to change, but it is also normatively questionable as to whether an attempt to change them through interventions should be made at all. In contrast, our results indicate that perceptions of stockholders are malleable and frequently incorrect, providing a much larger normative scope for behavioral change.

An interesting extension of our work concerns the interplay between identification and perceptions. We have documented the importance of negative perceptions for identification with the group of non-stockholders. However, identity could also shape how people think about different groups. In the model of Bonomi, Gennaioli, and Tabellini (2021), individuals slant their beliefs towards the characteristics of groups they identify with. Taken together with our result that beliefs causally influence decision-making, interesting implications and novel predictions emerge. For example, consider the common practice of stock compensation, where listed companies pay employees wages or bonuses in the form of company shares. Thus, employees who previously did not own stocks suddenly become stockholders. This exogenous change in group membership may weaken their identification with the group of non-stockholders, leading to more favorable views towards stockholders. Our framework then predicts that those employees are subsequently more likely to invest in stocks in general. Similarly, frequently discussed policy proposals involve the process of automatically investing peoples’ retirement savings in the stock market, or directly providing them with money invested in a collection of index funds. While our framework can explain the heavy resistance against such proposals, it also predicts that, once implemented, they could increase the participation rate among affected individuals. These effects may extend beyond the domain of decision-making to individual values and attitudes. For instance, Margalit and Shayo (2021) show that exogenously inducing individuals to invest in the stock market changes their socioeconomic values and political ideology. Decreasing identification with the group of non-stockholders could be an important factor explaining this shift in values and ideology.

We conclude by pointing out that our framework and methodology are not solely 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 potentially influences decision-making and particularly aversion behavior in these domains.

## References

- Akerlof, George A., and Rachel E. Kranton (2000). "Economics and Identity". *Quarterly Journal of Economics* 115 (3): 715–53. [5, 7]
- Alesina, Alberto, Armando Miano, and Stefanie Stantcheva (2022). "Immigration and Redistribution". *Review of Economic Studies*, (forthcoming): [25]
- Ariely, Dan, Anat Bracha, and Stephan Meier (2009). "Doing Good or Doing Well ? Image Motivation and Monetary Incentives in Behaving Prosocially". *American Economic Review* 99 (1): 544–55. [5, 18]
- Atkin, David, Eve Colson-Sihra, and Moses Shayo (2021). "How do we choose our identity? A revealed preference approach using food consumption". *Journal of Political Economy* 129 (4): 1193–251. [5]
- Badarınza, Cristian, John Y. Campbell, and Tarun Ramadorai (2016). "International Comparative Household Finance". *Annual Review of Economics* 8: 111–44. [8, 9]
- Baillon, Aurélien, Zhenxing Huang, Asli Selim, and Peter P. Wakker (2018). "Measuring Ambiguity Attitudes for All (Natural) Events". *Econometrica* 86 (5): 1–15. [72]
- Barberis, Nicholas, Ming Huang, and Richard H. Thaler (2006). "Individual preferences, monetary gambles, and stock market participation: A case for narrow framing". *American Economic Review* 96 (4): 1069–90. [4]
- Bardsley, Nicholas (2008). "Dictator game giving: Altruism or artefact?" *Experimental Economics* 11 (2): 122–33. [14]
- Bauer, Rob, and Paul Smeets (2015). "Social identification and investment decisions". *Journal of Economic Behavior and Organization* 117: 121–34. URL: <http://dx.doi.org/10.1016/j.jebo.2015.06.006>. [5]
- Ben-David, Itzhak, Francesco Franzoni, and Rabih Moussawi (2017). "Exchange-Traded Funds". *Annual Review of Financial Economics* 9 (1): 169–89. [34]
- Bénabou, Roland, Armin Falk, Luca Henkel, and Jean Tirole (2022). "Eliciting Moral Preferences: Theory and Experiment". *Working Paper*, [18]
- Bénabou, Roland, and Jean Tirole (2006). "Incentives and prosocial behavior". *American Economic Review* 96 (5): 1652–78. [5]
- Bénabou, Roland, and Jean Tirole (2011). "Identity, morals, and taboos: Beliefs as assets". *Quarterly Journal of Economics* 126 (2): 805–55. [5, 7, 32]
- Bertrand, Marianne, Emir Kamenica, and Jessica Pan (2015). "Gender identity and relative income within households". *Quarterly Journal of Economics* 130 (2): 571–614. [5]
- Böhm, Robert, Hannes Rusch, and Jonathan Baron (2020). "The psychology of intergroup conflict: A review of theories and measures". *Journal of Economic Behavior and Organization* 178: 947–62. [34]
- Bollinger, Christopher R., Barry T. Hirsch, Charles M. Hokayem, and James P. Ziliak (2019). "Trouble in the Tails? What We Know about Earnings Nonresponse 30 Years after Lillard, Smith, and Welch". *Journal of Political Economy* 127 (5): 2143–85. [32]
- Bonomi, Giampaolo, Nicola Gennaioli, and Guido Tabellini (2021). "Identity, Beliefs, and Political Conflict". *Quarterly Journal of Economics* 136 (4): 2371–411. [5, 35]
- Bordalo, Pedro, Katherine Coffman, Nicola Gennaioli, and Andrei Shleifer (2016). "Stereotypes". *Quarterly Journal of Economics* 131 (4): 1753–94. [2, 5, 12]
- Burke, Peter J., and Jan E. Stets (2009). *Identity Theory*. New York: Oxford University Press. [5]
- Burnham, Terence, Kevin McCabe, and Vernon L. Smith (2000). "Friend-or-foe intentionality priming in an extensive form trust game". *Journal of Economic Behavior and Organization* 43 (1): 57–73. [14]
- Bursztyn, Leonardo, Bruno Ferman, Stefano Fiorin, Martin Kanz, and Gautam Rao (2018). "Status Goods: Experimental evidence from platinum credit cards". *Quarterly Journal of Economics* 133 (3): 1561–95. [5]
- Bursztyn, Leonardo, and Robert Jensen (2017). "Social image and economic behavior in the field: Identifying, understanding, and shaping social pressure". *Annual Review of Economics* 9: 131–53. [5]

- Bursztyn, Leonardo, and David Y. Yang (2022).** "Misperceptions about Others". *Annual Review of Economics*, (forthcoming): [25]
- Cappelen, Alexander W., Ulrik H. Nielsen, Erik Sørensen, Bertil Tungodden, and Jean Robert Tyran (2013).** "Give and take in dictator games". *Economics Letters* 118 (2): 280–83. [14]
- Chen, Daniel L., Martin Schonger, and Chris Wickens (2016).** "oTree-An open-source platform for laboratory, online, and field experiments". *Journal of Behavioral and Experimental Finance* 9: 88–97. [9]
- Currie, Janet (2006).** "The Take-up of Social Benefits". In *Poverty, the Distribution of Income, and Public Policy*. Alan Auerbach, David Card, and John Quigley, ed. New York: Russell Sage, 80–148. [35]
- D'Acunto, Francesco (2020).** "Tear Down This Wall Street: Anti-finance Rhetoric, Subjective Beliefs, and Investment". *Working Paper*, [5]
- D'Acunto, Francesco, Marcel Prokopczuk, and Michael Weber (2019).** "Historical antisemitism, ethnic specialization, and financial development". *Review of Economic Studies* 86 (3): 1170–206. [5]
- De Quidt, Jonathan, Johannes Haushofer, and Christopher Roth (2018).** "Measuring and bounding experimenter demand". *American Economic Review* 108 (11): 3266–302. [24]
- Depetris-Chauvin, Emilio, Ruben Durante, and Filipe Campante (2020).** "Building nations through shared experiences: Evidence from African football". *American Economic Review* 110 (5): 1572–602. [5]
- Dimmock, Stephen G., Roy Kouwenberg, Olivia S. Mitchell, and Kim Peijnenburg (2016).** "Ambiguity aversion and household portfolio choice puzzles: Empirical evidence". *Journal of Financial Economics* 119 (3): 559–77. [4]
- Dimmock, Stephen G., Roy Kouwenberg, and Peter P. Wakker (2016).** "Ambiguity Attitudes in a Large Representative Sample". *Management Science* 62 (5): 1363–80. [4]
- Doosje, Bertjan, Naomi Ellemers, and Russell Spears (1995).** "Perceived intragroup variability as a function of group status and identification". *Journal of Experimental Social Psychology* 31 (5): 410–36. [29, 74]
- Ellingsen, Tore, Magnus Johannesson, Johanna Mollerstrom, and Sara Munkhammar (2012).** "Social framing effects: Preferences or beliefs?" *Games and Economic Behavior* 76 (1): 117–30. [14]
- Enke, Benjamin, Ricardo Rodríguez-Padilla, and Florian Zimmermann (2022).** "Moral Universalism: Measurement and Economic Relevance". *Management Science* 68 (5): 3590–603. [30, 31]
- Eyal, Peer, Rothschild David, Gordon Andrew, Evernden Zak, and Damer Ekaterina (2021).** "Data quality of platforms and panels for online behavioral research". *Behavior Research Methods* 54: 1643–62. [9]
- Fagereng, Andreas, Charles Gottlieb, and Luigi Guiso (2017).** "Asset Market Participation and Portfolio Choice over the Life-Cycle". *Journal of Finance* 72 (2): 705–50. [1]
- Falk, Armin (2021).** "Facing yourself - A note on self-image". *Journal of Economic Behavior and Organization* 186: 724–34. [5]
- Falk, Armin, Anke Becker, Thomas Dohmen, Benjamin Enke, David Huffman, and Uwe Sunde (2018).** "Global Evidence on Economic Preferences". *Quarterly Journal of Economics* 133 (4): 1645–92. [19]
- Falk, Armin, Anke Becker, Thomas Dohmen, David Huffman, and Uwe Sunde (2022).** "The preference survey module: A validated instrument for measuring risk, time, and social preferences". *Management Science*, (forthcoming): [72]
- Falk, Armin, and Florian Zimmermann (2017).** "Consistency as a Signal of Skills". *Management Science* 63 (7): 2197–210. [15]
- Fernandes, Daniel, John G. Lynch, and Richard G. Netemeyer (2014).** "Financial literacy, financial education, and downstream financial behaviors". *Management Science* 60 (8): 1861–83. [5]
- Forman, Chris, Anindya Ghose, and Batia Wiesenfeld (2008).** "Examining the relationship between reviews and sales: The role of reviewer identity disclosure in electronic markets". *Information Systems Research* 19 (3): 291–313. [5]
- Fouka, Vasiliki (2020).** "Backlash: The Unintended Effects of Language Prohibition in U.S. Schools after World War I". *Review of Economic Studies* 87 (1): 204–39. [25]
- Gaudecker, Hans-martin Von, Axel Wogroly, and Christian Zimpelmann (2021).** "The Distribution of Ambiguity Attitudes". *Working Paper*, [72]



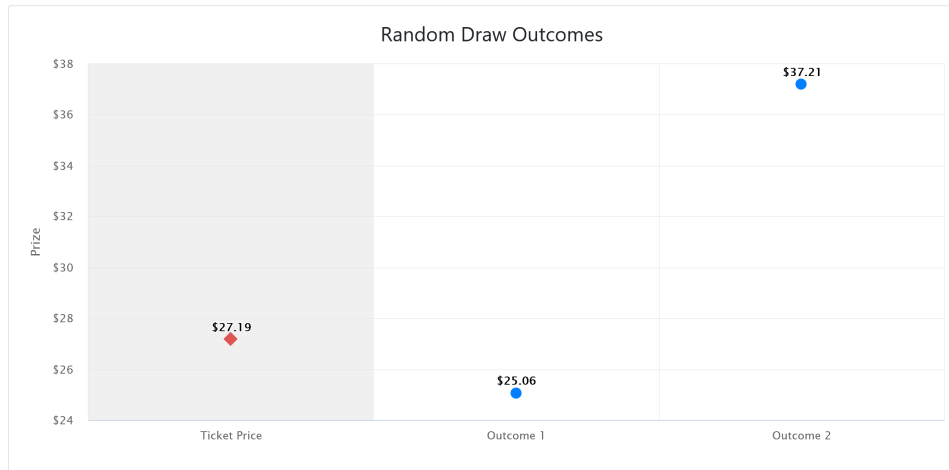
- Giglio, Stefano, Matteo Maggiori, Johannes Stroebe, and Stephen Utkus (2021).** “Five facts about beliefs and portfolios”. *American Economic Review* 111 (5): 1481–522. [4]
- Gomes, Francisco, Michael Haliassos, and Tarun Ramadorai (2021).** “Household finance”. *Journal of Economic Literature* 59 (3): 919–1000. [1, 4]
- Goodwin, Geoffrey P., Jared Piazza, and Paul Rozin (2014).** “Moral character predominates in person perception and evaluation”. *Journal of Personality and Social Psychology* 106 (1): 148–68. [6]
- Grinblatt, Mark, Matti Keloharju, and Juhani Linnainmaa (2011).** “IQ and Stock Market Participation”. *Journal of Finance* 66 (6): 2121–64. [4]
- Grosfeld, Irena, Alexander Rodnyansky, and Ekaterina Zhuravskaya (2013).** “Persistent antimarket culture: A legacy of the pale of settlement after the holocaust”. *American Economic Journal: Economic Policy* 5 (3): 189–226. [5]
- Grossman, Zachary, and Joël J. van der Weele (2017).** “Self-image and willful ignorance in social decisions”. *Journal of the European Economic Association* 15 (1): 173–217. [5, 18]
- Guiso, Luigi, Paola Sapienza, and Luigi Zingales (2008).** “Trusting the stock market”. *Journal of Finance* 63 (6): 2557–600. [5, 73]
- Guiso, Luigi, and Paolo Sodini (2013).** “Household Finance: An Emerging Field”. In *Handbook of the Economics of Finance*. George M. Constantinides, Milton Harris, and Rene M. Stulz, ed. vol. 2, Elsevier, 1397–532. [1, 35]
- Gupta, Neeraja, Luca Rigotti, and Alistair Wilson (2021).** “The Experimenters’ Dilemma: Inferential Preferences over Populations”. *Working Paper*, [9]
- Haaland, Ingar, Christopher Roth, and Johannes Wohlfart (2021).** “Designing Information Provision Experiments”. *Journal of Economic Literature*, (forthcoming): [3]
- Haliassos, Michael, Thomas Jansson, and Yigitcan Karabulut (2017).** “Incompatible european partners? cultural predispositions and household financial behavior”. *Management Science* 63 (11): 3780–808. [5]
- Hartzmark, Samuel M., and Abigail B. Sussman (2019).** “Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows”. *Journal of Finance* 74 (6): 2789–837. [34]
- Heaton, John, and Deborah Lucas (2000).** “Portfolio Choice in the Presence of Background Risk”. *Economic Journal* 110 (460): 1–26. [1]
- Heffetz, Ori, and Robert H. Frank (2011).** “Preferences for status: Evidence and economic implications”. In *Handbook of Social Economics*. Jess Benhabib, Alberto Bisin, and Matthew O. Jackson, ed. vol. 1, North-Holland: Elsevier B.V., 69–91. [7]
- Henkel, Luca, Philipp Sprengholz, Lars Korn, Cornelia Betsch, and Robert Böhm (2022).** “The association between vaccination status identification and societal polarization”. *Nature Human Behaviour*, (forthcoming): [74]
- Hill, Daniel H. (2006).** “Wealth dynamics: Reducing noise in panel data”. *Journal of Applied Econometrics* 21 (6): 845–60. [32]
- Hobolt, Sara B., Thomas J. Leeper, and James Tilley (2021).** “Divided by the vote: Affective polarization in the wake of the brexit referendum”. *British Journal of Political Science* 51 (4): 1476–93. [8]
- Hurd, Michael, Maarten Van Rooij, and Joachim Winter (2011).** “Stock Market Expectations of Dutch Households”. *Journal of Applied Econometrics* 26 (3): 416–36. [72]
- Iyengar, Shanto, Gaurav Sood, and Yphtach Lelkes (2012).** “Affect, not ideology: A social identity perspective on polarization”. *Public Opinion Quarterly* 76 (3): 405–31. [8]
- Jordà, Òscar, Katharina Knoll, Dmitry Kuvshinov, Moritz Schularick, and Alan M. Taylor (2019).** “The Rate of Return on Everything, 1870–2015”. *Quarterly Journal of Economics* 134 (3): 1225–98. [1]
- Kaustia, Markku, and Sami Torstila (2011).** “Stock market aversion? Political preferences and stock market participation”. *Journal of Financial Economics* 100 (1): 98–112. [4]
- Klor, Esteban F., and Moses Shayo (2010).** “Social identity and preferences over redistribution”. *Journal of Public Economics* 94 (3–4): 269–78. [29, 74]
- Kuchler, Theresa, and Johannes Stroebe (2021).** “Social Finance”. *Annual Review of Financial Economics* 13: 37–55. [5]

- Kuhn, Moritz, Moritz Schularick, and Ulrike I. Steins (2020).** "Income and Wealth Inequality in America, 1949–2016". *Journal of Political Economy* 128 (9): 3469–519. [1]
- Leach, Colin Wayne, Martijn van Zomeren, Sven Zebel, Michael L.W. Vliek, Sjoerd F. Pennekamp, Bertjan Doosje, Jaap W. Ouwerkerk, and Russell Spears (2008).** "Group-Level Self-Definition and Self-Investment: A Hierarchical (Multicomponent) Model of In-Group Identification". *Journal of Personality and Social Psychology* 95 (1): 144–65. [74]
- Lenz, Guido (2022).** "Hollywood, Wall Street, and Mistrusting Individual Investors". *Working Paper*, [5]
- Liberman, Varda, Steven M. Samuels, and Lee Ross (2004).** "The name of the game: Predictive power of reputations versus situational labels in determining Prisoner's Dilemma game moves". *Personality and Social Psychology Bulletin* 30 (9): 1175–85. [14]
- Lipovetsky, Stan, and Michael Conklin (2001).** "Analysis of regression in game theory approach". *Applied Stochastic Models in Business and Industry* 17 (4): 319–30. [29]
- List, John A. (2007).** "On the interpretation of giving in dictator games". *Journal of Political Economy* 115 (3): 482–93. [14]
- Margalit, Yotam, and Moses Shayo (2021).** "How Markets Shape Values and Political Preferences: A Field Experiment". *American Journal of Political Science* 65 (2): 473–92. [35]
- Mechtenberg, Lydia, Grischa Perino, Nicolas Treich, Jean-Robert Tyran, and Stephanie Wang (2022).** "Self-Signaling in Voting". *Working Paper*, [5]
- Meyer, Bruce D., Wallace K.C. Mok, and James X. Sullivan (2015).** "Household surveys in crisis". *Journal of Economic Perspectives* 29 (4): 199–226. [32]
- Mummolo, Jonathan, and Erik Peterson (2019).** "Demand effects in survey experiments: An empirical assessment". *American Political Science Review* 113 (2): 517–29. [24]
- Nofsinger, John R. (2017).** *The psychology of investing*. Routledge. [1]
- Oh, Suanna (2021).** "Does Identity Affect Labor Supply?" *Working Paper*, [5]
- Puri, Manju, and David T. Robinson (2007).** "Optimism and economic choice". *Journal of Financial Economics* 86 (1): 71–99. [4]
- Rooij, Maarten van, Annamaria Lusardi, and Rob Alessie (2011).** "Financial literacy and stock market participation". *Journal of Financial Economics* 101 (2): 449–72. [4, 72]
- Schneider, Florian H. (2022).** "Signaling Ideology through Consumption". *Working Paper*, [5]
- Shayo, Moses (2020).** "Social identity and economic policy". *Annual Review of Economics* 12: 355–89. [5]
- Shayo, Moses, and Asaf Zussman (2011).** "Judicial ingroup bias in the shadow of terrorism". *Quarterly Journal of Economics* 126 (3): 1447–84. [5]
- Shefrin, Hersch (2002).** *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*. New York: Oxford Academic. [1]
- Stets, Jan E., and Richard T. Serpe (2013).** "Identity Theory". In *Handbook of Social Psychology*. John DeLamater and Amanda Ward, ed. Springer. Chap. 2, 31–60. [5]
- Strohming, Nina, and Shaun Nichols (2014).** "The essential moral self". *Cognition* 131 (1): 159–71. [6]
- Tversky, Amos, and Daniel Kahneman (1983).** "Extensional versus Intuitive Reasoning: The Conjunction Fallacy in Probability Judgment". *Psychological Review* 90 (4): 293–315. [2, 12]
- Vissing-Jorgensen, Annette (2004).** "Perspectives on behavioral finance: Does 'irrationality' disappear with wealth? Evidence from expectations and actions". In *NBER Macroeconomics Annual 2003*. Mark Gertler and Kenneth Rogoff, ed. Cambridge, MA: MIT Press, 139–94. [4]
- Wojciszke, Bogdan, Roza Bazinska, and Marcin Jaworski (1998).** "On the dominance of moral categories in impression formation". *Personality and Social Psychology Bulletin* 24 (12): 1251–63. [6]

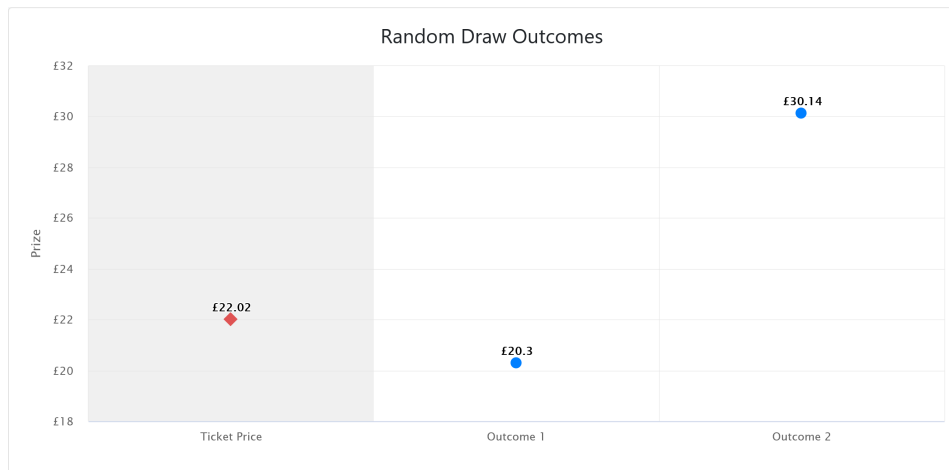
# Appendix

## A Additional figures

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



(a) Figure visualization and dollar currency



(b) Figure visualization and pound currency

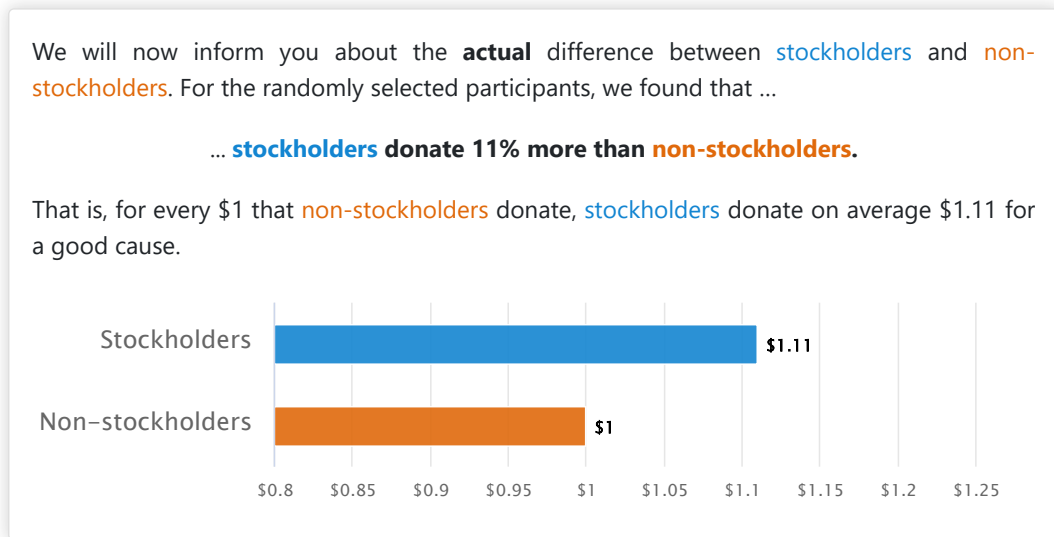
Prize in Dollar	
Buying Price	\$27.19
Outcome 1	\$25.06
Outcome 2	\$37.21

(c) Table visualization and dollar currency

Prize in Pound	
Buying Price	£22.02
Outcome 1	£20.3
Outcome 2	£30.14

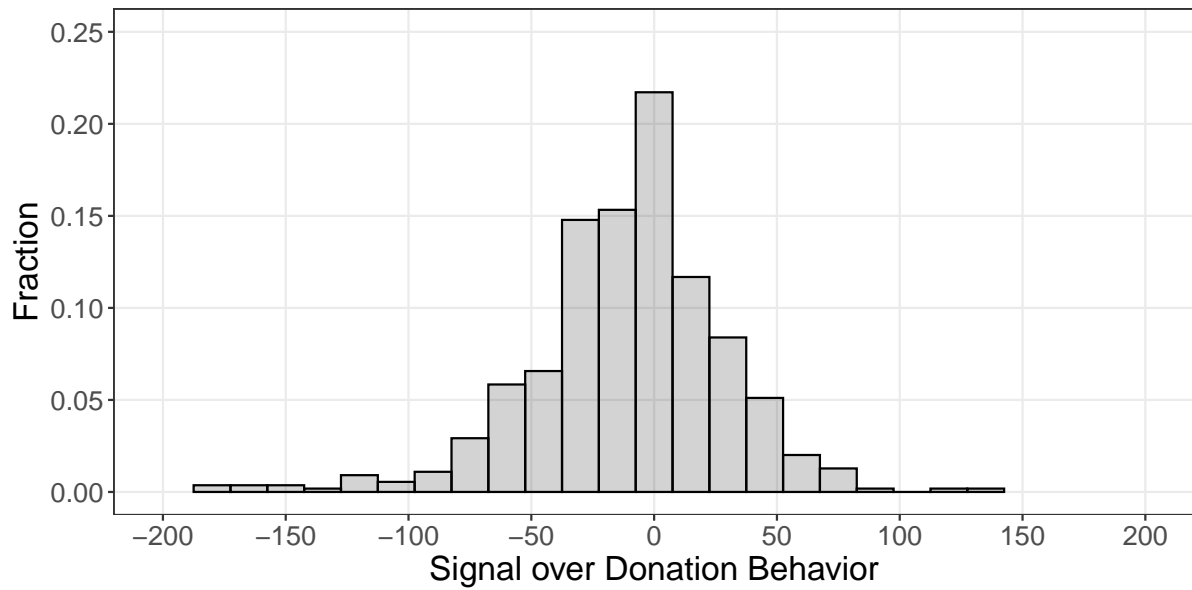
(d) Table visualization and pound currency

Figure A.2: Example of information provided to subjects



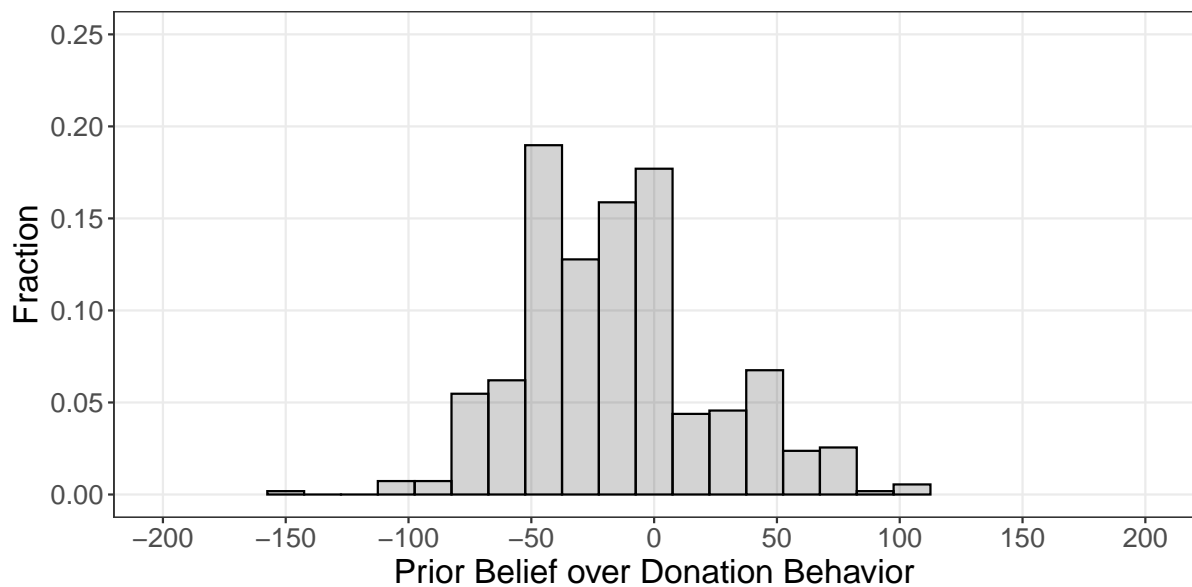
Next

Figure A.3: Distribution of signals generated in the information experiment



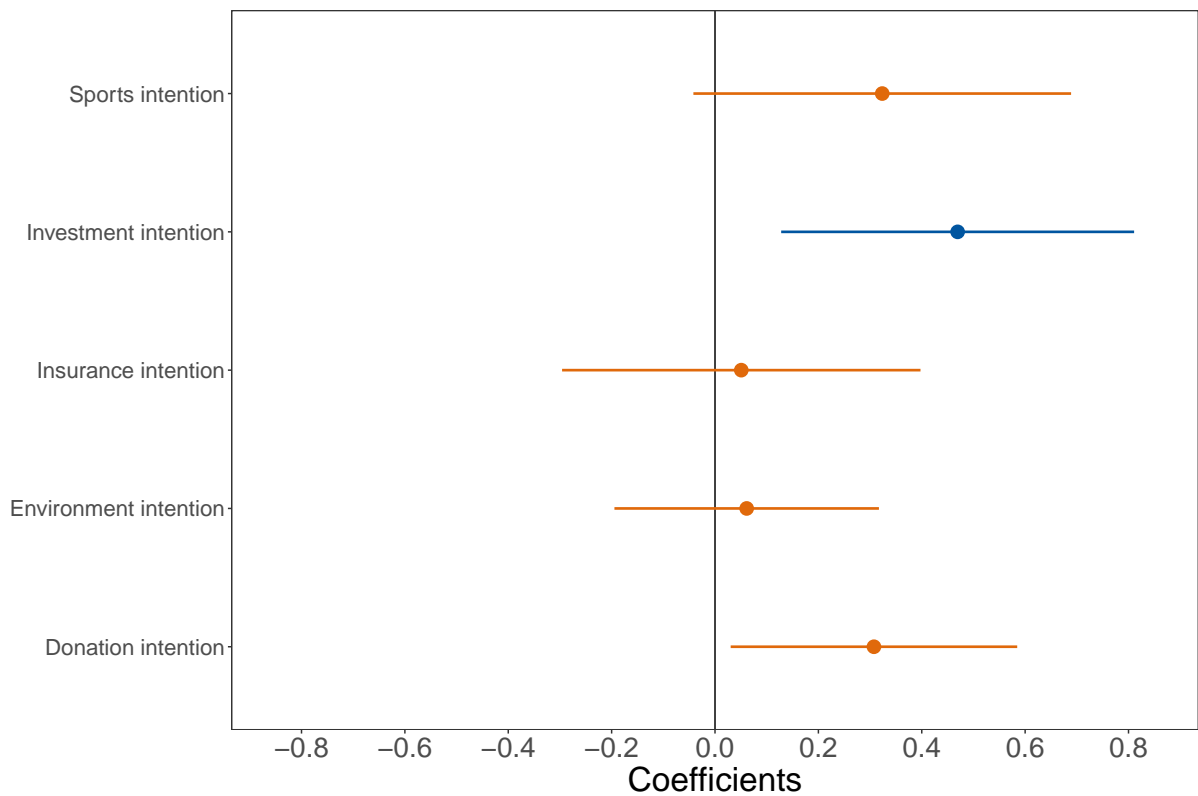
Notes: This figure displays in a histogram the distribution of signals subjects received in the information experiment over the difference in donation behavior between stockholder and non-stockholder. Higher values indicate signals that stockholder donated more relative to non-stockholder.

Figure A.4: Distribution of prior beliefs in the information experiment



Notes: This figure displays in a histogram 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.

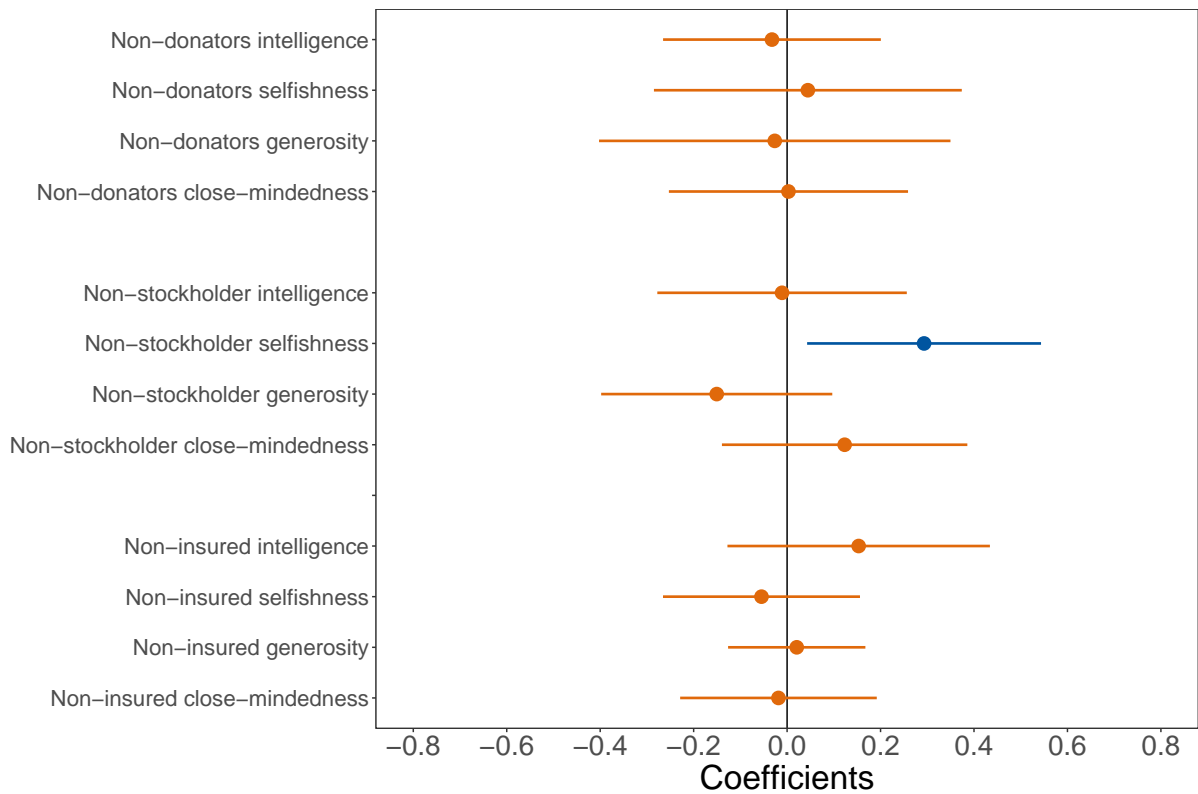
Figure A.5: Information experiment treatment effect on intentions in follow-up



*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 and zero if non-stockholders donated more or the same amount on different intention variables elicited in the follow-up to the information experiment. The intention variables measure subject's intention to do 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 easy of exposition. Higher values thus indicate higher intention to do the displayed activity. Bars indicate 95% confidence intervals.

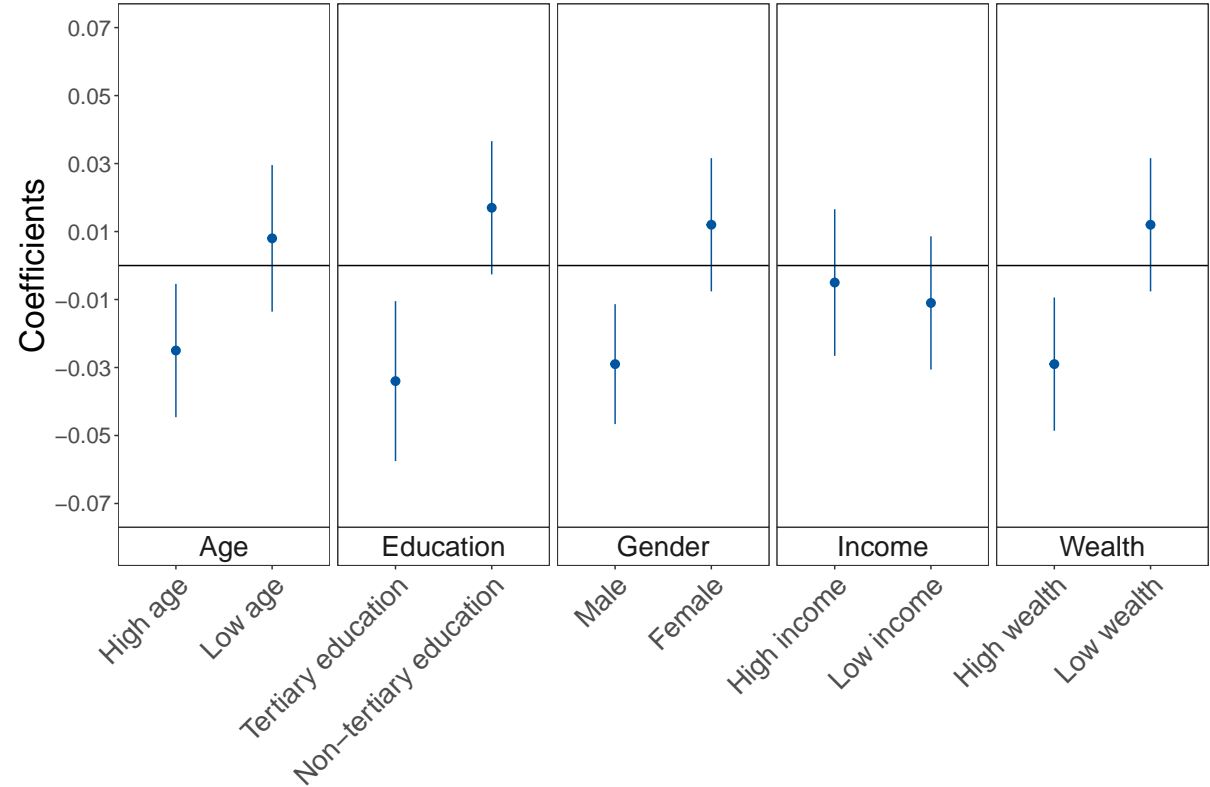


Figure A.6: Information experiment treatment effect on beliefs in follow-up



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 and zero if non-stockholders donated more on different belief variables elicited in the follow-up to the information experiment. Beliefs are elicited 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. Bars indicate 95% confidence intervals.

Figure A.7: Heterogeneity in the relationship between negative perceptions and stock market participation



Notes: This figure displays interactions term coefficients obtained from an OLS regression. The specification is the same as in Column (4) of Table 7, with the addition of interactions of negative perceptions with the displayed demographic variables. The more negative the coefficient, the stronger is the association of increases in negative perceptions with decreases in stock market participation among the specified subgroup.

## B Additional tables

Table B.1: Overview of samples

Label	Provider	<i>N</i>	Covered in	Description
Perception pre-test	Pureprofile	194	Section 3, Appendix C	Survey to select character traits based on identity-relevance and association with stockholders.
Perception survey Netherlands	LISS Panel	3,272	Section 3, 5.1 and 5.3	Survey to measure people's perceptions of stockholders and non-stockholders in the Netherlands.
Perception survey US	Prolific	402	Section 3	Survey to measure people's perceptions of stockholders and non-stockholders in the US.
Perception robustness survey	Panel Inzicht	1,016	Section 3, Appendix D	Additional surveys to measure perceptions using different elicitation methods
Description experiment	Prolific	515	Section 4.1	Experiment to test prediction 1 of the conceptual framework.
Information experiment	Prolific	548	Section 4.3	Experiment to test prediction 2 of the conceptual framework.
Information generation survey	Prolific	272	Section 4.3	Survey to generate the information about the donation behavior of stockholders and non-stockholders for the information experiment.
Information experiment follow-up survey	Prolific	428	Section 4.3	Survey to investigate experimenter demand effects as well as persistence and validity of the treatment effects of the information experiment.
LISS panel non-stockholder sample	LISS Panel	1,594	Sections 4.5, 5.2 and 5.4	Sub-sample of the main LISS panel sample to investigate implications of perceptions of stockholders.

Table B.2: Overview of sample demographics

Variable	Netherlands			United States			
	CBS (2020)	Full LISS panel	Main sample (financial deciders)	ACS (2020)	Perceptions survey	Description experiment	Information experiment
<b>Gender</b>							
Female	51%	54%	51%	51%	77%	69%	78%
<b>Age</b>							
16 - 34 years	29%	25%	13%	46%	67%	58%	70%
35 - 64 years	48%	46%	49%	38%	31%	38%	28%
65 years and older	23%	28%	38%	16%	2%	4%	2%
<b>Education</b>							
University degree	33%	40%	29%	28%	34%	36%	34%
<b>Net income</b>							
Below 20,000 euros/dollars	20%	20%	17%	29%	20%	24%	28%
20,000 - 50,000 euros/dollars	51%	51%	59%	34%	35%	36%	32%
Above 50,000 euros/dollars	30%	29%	24%	37%	45%	40%	40%
Sample size		6,462	3,272		402	515	548

Notes: CBS stands for Centraal Bureau voor de Statistiek, the statistical bureau of the Netherlands. ACS stands for American Community Survey, administered by the U.S. Census Bureau.

Table B.3: Description experiment balance test

Variable	Treatment stock description (1)	Treatment draw description (2)	$H_0 : (1) = (2)$ p-value (3)
Age	35.52	35.03	0.89
Female	0.70	0.68	0.58
High income	0.53	0.48	0.23
High wealth	0.65	0.62	0.40
Is financial decider	0.65	0.62	0.45
Has college degree	0.35	0.38	0.51

Notes: Column (1) and (2) displays mean values of variables for both treatments of the description experiment. The last column shows p-values obtained using Wilcoxon signed-rank tests comparing the variables of both treatments.

Table B.4: Description experiment treatment effect on decision-making

<b>Panel A: Between-subject effect</b>		
	<i>Dependent variable: Choice of risky option</i>	
	(1)	(2)
Constant	0.524*** (0.021)	0.600*** (0.084)
Stock description	-0.142*** (0.032)	-0.132*** (0.032)
Demographic controls		X
Subjects	515	509
Observations	2,060	2,036
<b>Panel B: Within-subject effect</b>		
	<i>Dependent variable: Choice of risky option</i>	
	(1)	(2)
Constant	0.498*** (0.016)	0.583*** (0.069)
Stock description	-0.117*** (0.016)	-0.117*** (0.016)
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 financial decision-making. Significance levels are \*p<0.1; \*\*p<0.05; \*\*\*p<0.01.

Table B.5: Information experiment balance test

Variable	Correlation coefficient $r$ (1)	$H_0 : r = 0$ p-value (2)
Prior Belief	0.01	0.89
Number of random draw option choices	-0.05	0.24
Age	0.03	0.46
Female	0.02	0.57
High income	-0.01	0.84
High wealth	-0.03	0.51
Is financial decider	-0.05	0.20
Has college degree	-0.02	0.70

Notes: Displays in column (1) are 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 (2) show p-values obtained using Pearson correlation tests.

Table B.6: Follow-up experiment balance test

Variable	Info experiment (1)	Follow-up survey (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
Female	0.76	0.85	0.04
High income	0.49	0.57	0.10
High wealth	0.58	0.61	0.57
Is financial decider	0.64	0.57	0.23
Has college degree	0.35	0.34	0.93

Notes: Column (1) displays mean values of variables of the information experiment. Column (2) does the same for the obfuscated follow-up experiment conducted after the information experiment. The last column shows p-values obtained using Wilcoxon signed-rank tests comparing the variables of the info experiment with the follow-up survey.

Table B.7: Follow-up experiment effect of binary coded information on investment intention and perceptions

	<i>Dependent variable:</i>			
	Investment intention		Perception over non-stockholder selfishness	
	(1)	(2)	(3)	(4)
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 <sup>2</sup>	0.039	0.107	0.025	0.100

*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 extend to which subjects perceive non-stockholder to be more selfish than stockholders on a scale from 1 to 9. Signal over donation behavior is a dummy variable equal to one if subjects received the signal that stockholders donated more than non-stockholders and zero if non-stockholders donated more or the same amount. 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. That is, a one unit increase means that a subject beliefs stockholders to donate 10% more than non-stockholders. Robust standard errors in parentheses. Demographic controls include age, gender, education, income, total financial assets and involvement in financial decision-making. Significance levels are \*p<0.1; \*\*p<0.05; \*\*\*p<0.01.



Table B.8: 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)
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 <sup>2</sup>	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 extend to which subjects perceive non-stockholder to be more selfish than stockholders on a scale from 1 to 9. Signal over donation behavior 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. That is, a one unit increase means a signal that stockholders donate 10% more than non-stockholders. Prior beliefs is subjects belief over the differences in donation behavior between stockholders and non-stockholders, with the same coding and unit as the signal over donation behavior variable. Robust standard errors in parentheses. Demographic controls include age, gender, education, income, total financial assets and involvement in financial decision-making. Significance levels are \*p<0.1; \*\*p<0.05; \*\*\*p<0.01.

Table B.9: The relationship between negative perceptions and the share of risky financial assets (for stockholders)

	<i>Dependent variable: Share of risky assets</i>			
	Full sample		Determinants sample	
	(1)	(2)	(3)	(4)
Average negative perception	-0.015 (0.013)	-0.013 (0.013)	-0.026 (0.018)	-0.018 (0.018)
Risk aversion				-0.038* (0.020)
Belief over positive stock returns				0.033** (0.015)
Financial numeracy				0.013 (0.022)
General trust				0.006 (0.021)
Ambiguity aversion				-0.008 (0.019)
Likelihood insensitivity				0.010 (0.018)
Mean dep. variable	0.359	0.352	0.347	0.347
Demographic controls		X	X	X
Observations	665	657	345	345

*Notes:* The table shows OLS regression coefficients. The dependent variable is the share of risky financial assets of all financial assets. The sample is restricted to all households with any risky financial assets. “Average negative perceptions” is defined as the mean over the negative perceptions over the traits greed, gambler and selfishness, with higher values indicating that stockholder are perceived more negative. See Appendix H.3 for details on the other independent variables. All displayed independent variables have been standardized. Robust standard errors in parentheses. Controls include age, gender, education, income and total financial assets. Significance levels: \* $p < 0.1$ , \*\* $p < 0.05$  and \*\*\* $p < 0.01$ .

Table B.10: Determinants of negative perceptions

	<i>Dependent variable: Average negative perceptions over stockholders</i>		
	Full sample	Non-stockholders	
	(1)	(2)	(3)
Constant	-0.291*** (0.102)	-0.237 (0.151)	-0.198 (0.156)
Has made negative experience with risky assets			0.052 (0.069)
'Money is not something you should talk about'			0.163** (0.071)
Parents invested in risky financial assets			-0.111 (0.079)
Left political spectrum	0.216*** (0.060)	0.141* (0.081)	0.139* (0.081)
Right political spectrum	0.040 (0.057)	0.040 (0.082)	0.029 (0.082)
Interested in the news	0.168*** (0.041)	0.204*** (0.058)	0.201*** (0.058)
Female	0.102** (0.040)	0.092 (0.056)	0.095* (0.056)
Education: upper secondary	-0.013 (0.061)	0.057 (0.081)	0.066 (0.081)
Education: tertiary	-0.100 (0.062)	-0.047 (0.082)	-0.022 (0.082)
Age	0.002 (0.001)	0.003 (0.002)	0.001 (0.002)
Income 2nd tercile	0.095* (0.053)	0.149** (0.071)	0.152** (0.071)
Income 3rd tercile	0.025 (0.055)	0.018 (0.078)	0.028 (0.078)
Wealth 2nd tercile	0.052 (0.051)	0.051 (0.070)	0.057 (0.070)
Wealth 3rd tercile	-0.070 (0.057)	-0.004 (0.077)	0.004 (0.077)
Observations	2669	1392	1392
$R^2$	0.020	0.022	0.028

Notes: The table shows OLS regression coefficients. The dependent variable is "Average negative perceptions" defined as the mean over the negative perceptions over the traits greed, gambler and selfishness, with higher values indicating that stockholder are perceived more negative. In columns (2) and (3) the same regression is run as in column (1), but the sample is restricted to observations for which we observe the full set of variables. This excludes all stockholders as we elicited some of the variables in column (3) only for non-stockholders. See Appendix H.4 for details on the independent variables. All displayed independent variables have been standardized. Robust standard errors in parentheses. Controls include age, gender, education, income and wealth. Significance levels: \*p<0.1, \*\*p<0.05 and \*\*\*p<0.01.

Table B.11: OLS-regression on the relationship between being a stockholder and self-assessed character traits

	<i>Dependent variable:</i>					
	Self-assessed greed		Self-assessed gambler		Self-assessed selfishness	
	(1)	(2)	(3)	(4)	(5)	(6)
Is stockholder	1.166*** (0.111)	0.733*** (0.114)	1.287*** (0.105)	1.136*** (0.112)	0.860*** (0.098)	0.461*** (0.102)
Constant	2.541*** (0.050)	4.056*** (0.234)	2.097*** (0.046)	2.734*** (0.218)	2.049*** (0.043)	3.303*** (0.202)
Demographic controls		X		X		X
Observations	3,271	3,267	3,271	3,267	3,271	3,267
R <sup>2</sup>	0.034	0.126	0.047	0.091	0.025	0.101

Notes: The table displays OLS-estimates. The dependent variable in columns (1) - (6) is subjects self-assessment over the character traits greed (1-2), gambler (3-4), and selfishness (5-6) on a scale from 0 to 10 (LISS data, Netherlands). Higher values indicate higher degrees of greed, gambler, and selfishness, respectively. Is stockholder is a dummy variable equal to one if the subject self-reports to have risky financial assets and zero otherwise. Robust standard errors in parentheses. Controls include age, gender, education, income and total financial assets. Significance levels are \*p<0.1; \*\*p<0.05; \*\*\*p<0.01.

Table B.12: Distribution of self-assessments and allocations

<b>Panel A: Netherlands</b>				
	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%

<b>Panel B: United States</b>				
	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: This table shows in Panel A the distribution of subjects self-assessment over the character traits greed, gambler, and selfishness. Elicited on a scale from 0 to 10, displayed are the proportions of subjects rating themselves as 0, 1-3, 4-6, or 7-10 for the respective traits 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 instead to a charity in an allocation game. Displayed are the proportions of subjects allocation 0-49, exactly 50, 52-99 and exactly 100 € to themselves separately for the group of stockholders and non-stockholders.

Table B.13: The relationship between negative perceptions and stock market participation (Probit)

	<i>Dependent variable: Has risky financial assets</i>			
	Full sample		Determinants sample	
	(1)	(2)	(3)	(4)
Average negative perception	-0.205*** (0.027)	-0.208*** (0.030)	-0.215*** (0.044)	-0.183*** (0.046)
General trust				0.119*** (0.046)
Ambiguity aversion				-0.104** (0.043)
Likelihood insensitivity				-0.082* (0.044)
Belief over positive stock returns				0.221*** (0.039)
Risk aversion				-0.146*** (0.040)
Financial numeracy				0.006 (0.050)
Mean dep. variable	0.228	0.226	0.231	0.231
Demographic controls		X	X	X
Observations	2915	2903	1493	1493

*Notes:* The table shows Probit regression coefficients. The dependent variable is an indicator variable equal to one if the subject owns stocks and zero if not. "Average negative perceptions" is defined as the mean over the negative perceptions over the traits greed, gambler and selfishness, with higher values indicating that stockholder are perceived more negative. See Appendix H.3 for details on the other independent variables. All displayed independent variables have been standardized. Robust standard errors in parentheses. Controls include age, gender, education, income and total financial assets. Significance levels: \*p<0.1, \*\*p<0.05 and \*\*\*p<0.01.



Table B.14: Misreporting of share of risky financial assets

	<i>Dependent variable:</i> Reported share of risky financial assets	
	(1)	(2)
Constant	0.154*** (0.022)	
Average negative perception	-0.009 (0.010)	-0.009 (0.013)
Financial numeracy		0.011 (0.022)
Share of risky assets	0.735*** (0.036)	0.742*** (0.049)
Demographic controls		X
Observations	372	228
$R^2$	0.584	0.624

*Notes:* The table shows OLS regression coefficients. The dependent variable is the share of risky financial assets of total financial assets of all assets reported in the LISS panel by any household member. The sample is restricted to all households which hold any risky financial assets based on the Dutch administrative data and also report any risky financial assets. See Appendix H.3 for details on the other independent variables. All displayed independent variables have been standardized. Robust standard errors in parentheses. Controls include age, gender, education, income and wealth. Significance levels: \*p<0.1, \*\*p<0.05 and \*\*\*p<0.01.

## 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, we used two criteria to select the traits: the traits need to be associated with stockholders and identity-relevant to subjects. Based on these conditions, we searched media outlets (articles, books, and movies) and gathered a list of eight candidates. For each candidate, we adapted a description from established psychological definitions. We further added two additional characteristics (non-religiousness and non-athleticness) as a validity check. We predicted no association with stockholders for these two characteristics and thus would expect subjects to rate them accordingly. The following list displays all ten characteristics together with the respective definitions:

Variable	Definition
Aggressiveness	The tendency toward social dominance, threatening behavior, and hostility.
Arrogance	The tendency to show an attitude of overbearing superiority or to make presumptuous claims or assumptions.
Dishonesty	The tendency to lack truthfulness, uprightness, and integrity.
Gambler	A person that 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 that 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. Table C.1 displays the results. We observe that people perceive the trait greed to be most strongly associated with stockholders, followed by gambler and selfishness. All three traits differ significantly from the random benchmark ( $p < 0.001$ , Wilcoxon signed-rank test). Reassuringly, we find that the characteristics non-athletic and non-religious are ranked last,

indicating that subjects answered deliberately.

Table C.1: Association of traits with stockholder ranking results

Characteristic	Average rank
Greed	3.85
Gambler	4.31
Selfishness	4.83
Arrogance	4.84
Impulsiveness	5.02
Impatience	5.51
Aggressiveness	5.89
Dishonesty	6.48
Non-athleticness	6.70
Non-religiousness	7.58

*Notes:* The table show the ordered average rank of the ten selected characteristics. Lower values indicate higher rank, i.e., a stronger association of the trait with stockholders.

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 Table C.2, the previously highest ranked traits greed, 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, 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: Identity relevance of traits results

Characteristic	Identity importance
Gambler	6.34
Greedy	5.90
Impulsiveness	5.68
Selfishness	5.65
Aggressiveness	5.53
Arrogance	5.30
Impatience	4.77
Dishonesty	4.49
Non-athleticness	4.47
Non-religiousness	3.35

*Notes:* The table show the ordered average identity relevance score of the ten selected characteristics. Higher values indicate higher self-assessed importance.

## D Additional evidence on people's perceptions of stockholders

### D.1 Design

This section describes the additional surveys that we used as robustness exercise for the main result presented in Section 3. In total, we collected data from 1,016 subjects 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, 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 not overload subjects with too many activities, we varied between subjects some of the activities. The following list displays the full set of activities together with the respective number of observations and formulation of the survey question.

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?
Playing lottery	Gambler	670	...played the lottery 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. Subjects make their guess separately for the group of stockholders and non-stockholders.

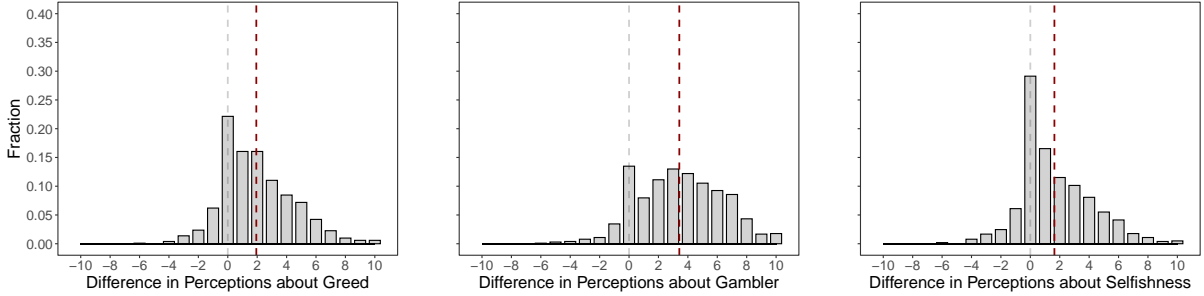
Lastly, we wanted to replicate our finding of negative perceptions over the three selected character traits presented in the main text for the LISS panel also for this sample. Accordingly, after eliciting

subject's estimates regarding the activities and dictator game, we included the standard module that elicits perceptions of the character traits greed, gambler, and selfishness, as described in Section 3.

## D.2 Results

Figure D.1 shows that we can fully replicate the finding of large negative perceptions of stockholders with respect to character traits in this sample. A large fraction of subjects perceives stockholders to be significantly more greedy, gambler and selfish ( $p < 0.001$ , Wilcoxon signed-rank test).

Figure D.1: Replication of Figure 1 using robustness sample

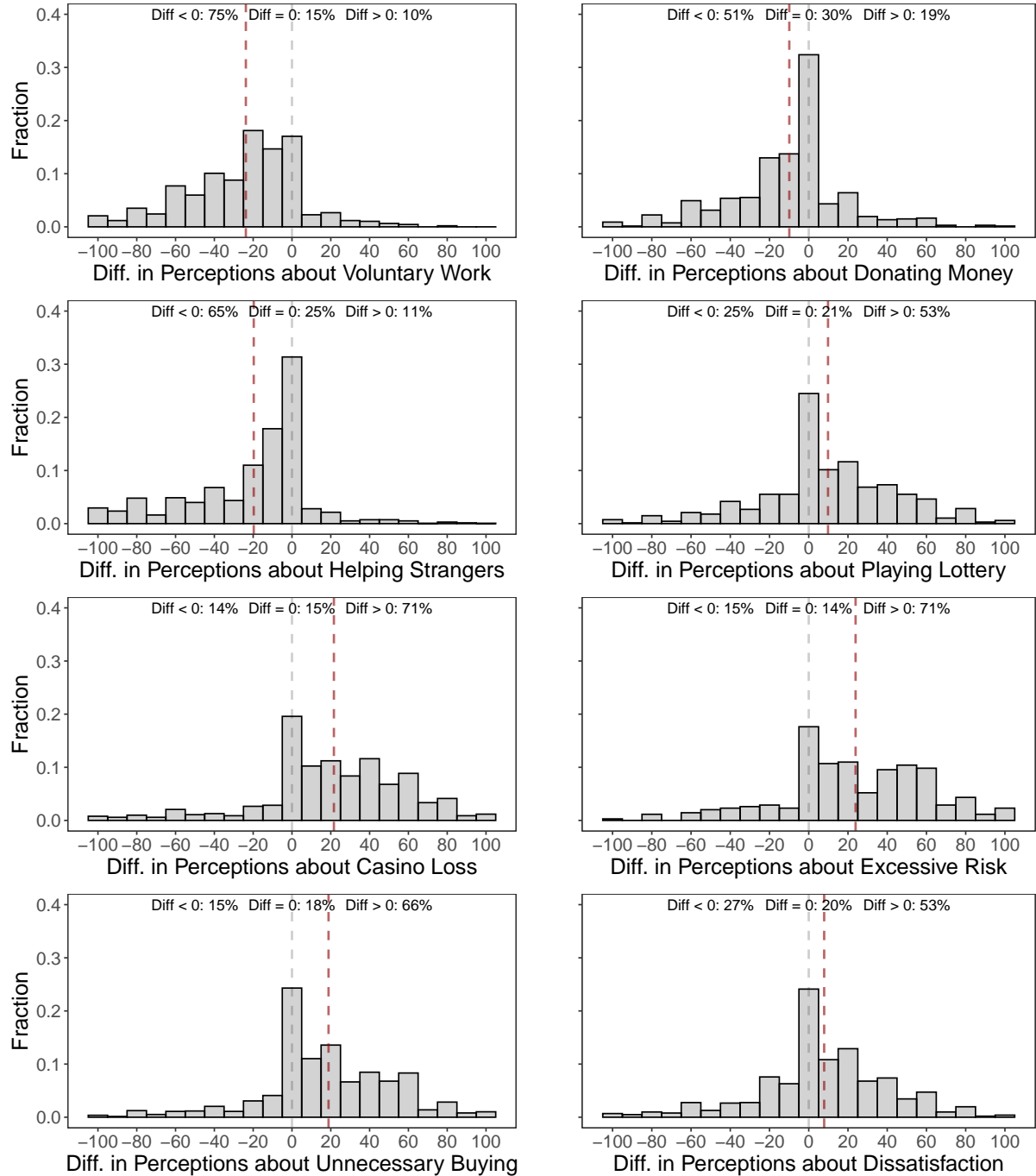


Notes: This figure displays histograms of perceptions of stockholder and non-stockholder. Perceptions are elicited on a scale ranging from 0 to 10 for both groups. Displayed are the difference in perceptions between stockholder and non-stockholder, with higher values indicating that stockholder are perceived to be more greedy, gambler and selfish.

Turning to the activities, as described in the main text, we find large and significant negative perceptions of stockholders for all eight activities. Figure D.2 shows the respective distributions of the differences. If the activities are positively described (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 (playing the lottery, 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.

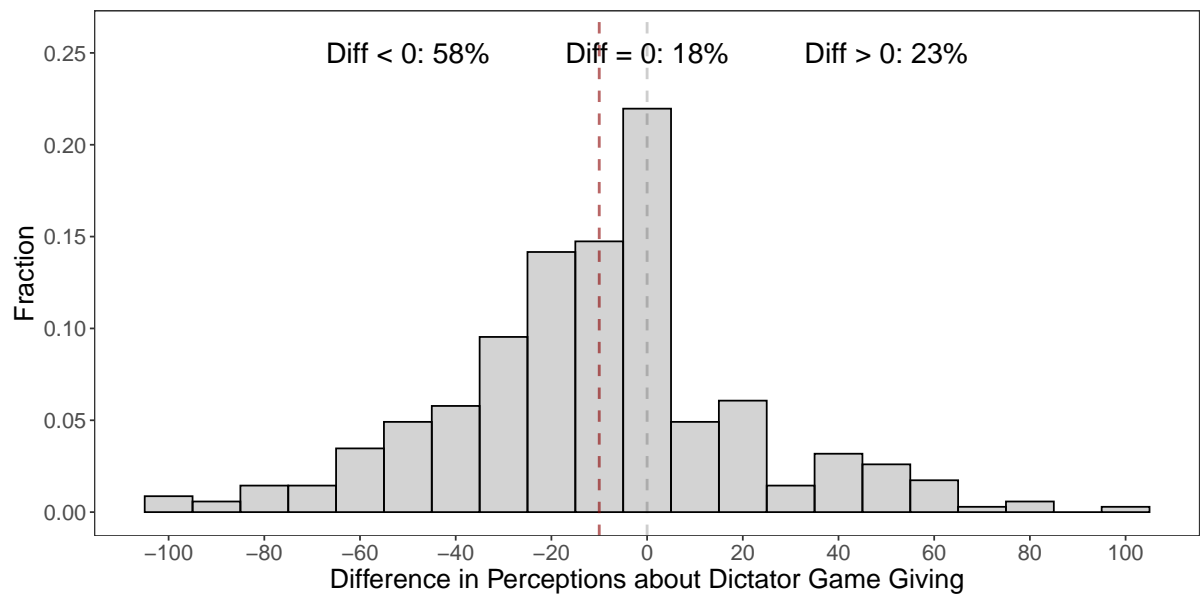
Lastly, Figure D.3 shows the dictator game results. Again, we find a large and significant average effect ( $p < 0.001$ , Wilcoxon signed-rank test), with almost 60% of subjects predicting stockholder to give strictly less to charity compared to non-stockholder.

Figure D.2: Perceptions of differences in activities between stockholder and non-stockholder



*Notes:* This figure displays histograms of perceptions of stockholder and non-stockholder with respect to various activities. Perceptions are elicited on a scale ranging from 0 to 100 for both groups. Displayed are the difference in perceptions between stockholder and non-stockholder, with higher values indicating that stockholder are perceived to be more likely to be engaged in the respective activity.

Figure D.3: Perceptions of differences in dictator game giving between stockholder and non-stockholder



*Notes:* This figure displays histograms of perceptions of stockholder and non-stockholder with respect to dictator game giving. Perceptions are elicited on a scale ranging from 0 to 100 for both groups. Displayed are the difference in perceptions between stockholder and non-stockholder, with higher values indicating that stockholder are perceived to allocate more money to the charity.

## E Validation of the stock description decision

Our approach for testing Prediction 1 of our framework is to vary the description of investments. We compare the choice behavior of subjects when facing options described as stock investments (treatment *Stock Description*) with options described as investment into random draws (treatment *Draw Description*). The idea is that the investment decisions in the *Stock Description* treatment are to a higher degree associated with the group of stockholders than in the *Draw Description* treatment.

Our experimental stock investments differs in two important aspects from real stock investments. First, we use stock prices that have already materialized, 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. Since subjects in our experiment still bet on stock price movements, we argue that the *Stock Description* investments are more strongly associated with actual stockholders than respective *Draw Description* 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 equalize associations.

To show empirically that the investment decision in *Stock Description* is to a higher degree associated with the group of stockholders, we use the full sample of 651 subjects of the description experiment. While the sample used for the main analysis consists solely of non-stockholders (as pre-registered), 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.

As hypothesized, these stockholders are significantly more likely to choose the stock option, i.e., the risky option described as stock investment. While non-stockholders choose this option in 38% out of all decisions, stockholders choose the option in 57% of decisions. Table E.1 shows that this result remains significant when controlling for demographic variables and even when controlling for behavior in the *Draw Description* treatment. That is, controlling for subjects' choice behavior towards an investment with identical risk and returns outside the stock market context, stockholders are still significantly more likely to choose the stock option than non-stockholders. This result provides evidence that the stock option in our experiment is, to a higher degree, associated with the group of stockholders than the random draw option.



Table E.1: Description experiment validation that the stock option is associated with the group of stockholders

	<i>Dependent variable:</i>			
	Choice of stock option			
	(1)	(2)	(3)	(4)
Constant	0.381*** (0.017)	0.444*** (0.078)	0.222*** (0.016)	0.269*** (0.075)
Is stockholder	0.193*** (0.037)	0.184*** (0.038)	0.152*** (0.035)	0.148*** (0.036)
Choice of draw option			0.318*** (0.024)	0.312*** (0.024)
Demographic Controls		X		X
Subjects	651	643	651	643
Observations	2,604	2,572	2,604	2,572

*Notes:* The table displays OLS-estimates. The dependent variable is an indicator variable equal to one if the risky option described as stock investment is chosen and zero if the safe option is chosen. Is stockholder is a indicator variable equal to one if the subject self-reports to have risky financial assets and zero otherwise. Choice of draw option is an indicator variable equal to one if the risky option described as random draw investment is chosen and zero if the safe option 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 financial decision-making. Significance levels are \*p<0.1; \*\*p<0.05; \*\*\*p<0.01.

## F Heterogeneous effects of information about stockholders on behavior

In Section 4.3, subjects received information the difference in donation behavior between stockholders and non-stockholders. This section analyzes heterogeneity in the effect of the information on behavior. By design, some subjects in our experiment receive a signal that the difference in donation behavior is more in favor of stockholders than they thought. Other subjects receive a more favorable signal towards non-stockholders relative to their prior beliefs. Lastly, there is a fraction of subjects that get confirming information because their signal is close to their prior beliefs. Therefore, we can use this variation to investigate whether the information has asymmetric effects on behavior: do subjects react stronger if they receive positive or negative news about stockholders?

**Variable.** We define the variable *signal relative to prior* as the signal over the difference in donation behavior subjects receive minus their belief over this difference, which was elicited prior to the information provision. Higher values indicate that subjects receive, relative to their prior belief, a more positive signal of stockholders donation behavior compared to non-stockholders. Based on this variable, we create three bins representing the three previously described groups, with -20 and 20 as the cutoffs. We chose this cutoffs to have symmetric cutoffs around zero while balancing the number of subjects in each bin. In total, there are 162 subjects whose signal is 20 percentage points or more below their prior beliefs (category *Negative signal relative to prior*). 163 subjects receive a signal that is within 20 percentage points of their prior belief, and 223 subjects receive a signal that is 20 percentage points or more above their prior beliefs (category *Positive signal relative to prior*). The larger number of subjects in the last bin is caused by subjects' beliefs being skewed in favor of non-stockholders compared to the actual difference (see Section 3.4).

**Results.** In Table F.1, we regress the categorical variable's three groups on subjects' likelihood to choose the stock option. Subjects that receive confirming information act as reference group in the regression, and we control for subjects' prior beliefs and their respective choice when options are described as a random draw. We observe that subjects receiving a signal favoring non-stockholders (relative to their prior) choose the stock option less, while subjects receiving a positive signal over stockholders donation behavior are more likely to choose the stock option. Crucially, only the later is statistically significant, and also about 50% larger in magnitude. Hence, subjects receiving positive information of stockholders react more strongly than subjects receiving negative information of the same magnitude relative to subjects priors. In Table F.2, we replicate this effect using a different binning approach: instead of using -20 and 20 as cutoffs, we choose the cutoffs such that each bin has the same number of subjects (183 subjects each, with cutoffs -13 and 31).

Table F.1: Heterogeneity in the effect of information about stockholders on decision-making using symmetric cutoffs

	<i>Dependent variable:</i>	
	Choice of stock option	
	(1)	(2)
Negative signal relative to prior	−0.051 (0.045)	−0.052 (0.045)
Positive signal relative to prior	0.078** (0.040)	0.083** (0.040)
Choice of draw option	0.241*** (0.025)	0.241*** (0.025)
Demographic Controls		X
Prior beliefs	X	X
Subjects	548	541
Observations	2,192	2,164

*Notes:* The table displays OLS-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. “Negative signal relative to prior” and “Positive signal relative to prior” are categories indicating whether subjects received negative or positive news over the donation behavior of stockholders relative to their priors. The reference category captures receiving news aligned with subjects’ prior beliefs. Cutoffs defining the categories were chosen to achieve symmetry around 0. “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 about the difference in donation behavior between stockholders and non-stockholders. Both, “Choice of draw option” and “Prior beliefs”, are elicited before subjects receive the signal. Demographic controls include age, gender, education, income, total financial assets and involvement in financial decision-making. Standard errors (in parentheses) are clustered at the subject level. Significance levels are \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

Table F.2: Heterogeneity in the effect of information about stockholders on decision-making using equal observation cutoffs

	<i>Dependent variable:</i>	
	Choice of stock option	
	(1)	(2)
Negative signal relative to prior	−0.035 (0.043)	−0.032 (0.043)
Positive signal relative to prior	0.082** (0.039)	0.099** (0.039)
Choice of draw option	0.241*** (0.025)	0.242*** (0.025)
Demographic Controls		X
Prior beliefs	X	X
Subjects	548	541
Observations	2,192	2,164

*Notes:* The table displays OLS-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. “Negative signal relative to prior” and “Positive signal relative to prior” are categories indicating whether subjects received negative or positive news over the donation behavior of stockholders relative to their priors. The reference category captures receiving news aligned with subjects’ prior beliefs. Cutoffs defining the categories were chosen such that every category has the same number of subjects. “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 about the difference in donation behavior between stockholders and non-stockholders. Both, “Choice of draw option” and “Prior beliefs”, are elicited before subjects receive the signal. Demographic controls include age, gender, education, income, total financial assets and involvement in financial decision-making. Standard errors (in parentheses) are clustered at the subject level. Significance levels are \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

## G Research transparency

All surveys that include experimental variation were preregistered at [aspredicted.org](https://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.

### G.1 Description experiment

The description experiment (Section 4.1) was preregistered at [https://aspredicted.org/66D\\_2XD](https://aspredicted.org/66D_2XD). In the preregistration, we specified that we would exclude subjects that 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 G.1 replicates the results using the preregistered exclusion restrictions.

Table G.1: Replication of Table B.4 using preregistered sample

<b>Panel A: Between-subject effect</b>		
	<i>Dependent variable: Choice of risky option</i>	
	(1)	(2)
Constant	0.579*** (0.022)	0.648*** (0.085)
Stock description	−0.154*** (0.034)	−0.147*** (0.034)
Demographic controls		X
Subjects	418	412
Observations	1,672	1,648
<b>Panel B: Within-subject effect</b>		
	<i>Dependent variable: Choice of risky option</i>	
	(1)	(2)
Constant	0.560*** (0.017)	0.614*** (0.071)
Stock description	−0.139*** (0.018)	−0.140*** (0.019)
Demographic controls		X
Subjects	418	412
Observations	3,344	3,296

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. Controls include age, gender, education, income, wealth and involvement in financial decision-making. Significance levels are \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

Table G.2: Replication of the result of Table 4 using preregistered specification

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

*Notes:* The table displays OLS-estimates. All eight 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 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. “Prior beliefs” is subjects belief over the difference 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. That is, a one unit increase means that a subject beliefs stockholders to donate 10% more than non-stockholders. “Signal over donation behavior” denotes the signal received over the difference in donation behavior, with the same coding and unit as “Prior beliefs”. Standard errors (in parentheses) are clustered at the subject level. Controls include age, gender, education, income, total financial assets and involvement in financial decision-making. Significance levels are \* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

## G.2 Information experiment

The information experiment (Section 4.3) was preregistered at [https://aspredicted.org/1B8\\_MXD](https://aspredicted.org/1B8_MXD). In the preregistration, instead of the OLS analysis shown in Table 4 with the choice of the stock option as dependent variable, we specified a slightly different specification in which choices of stock option and draw options enter as separate observations. Table G.2 replicates the results using the preregistered specification. The follow-up survey reported at the end of Section 4.4 was not preregistered.

## G.3 Correcting stereotypes experiment

The correcting stereotypes experiment (Section 4.5) was preregistered at [https://aspredicted.org/blind.php?x=DF3\\_5YR](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 34, 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.

## H Variables

### H.1 Demographic variables

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

**Age** Refers to the financial decider who participated in the survey. Obtained from the Dutch administrative data (or the LISS background questionnaire for regressions not involving admin data).

**Gender** Refers to the financial decider who participated 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 the year 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 the year 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 the year 2020.

## H.2 Stock market knowledge 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 questionnaire in the LISS panel.

**Actual stock market knowledge** Subjects are asked “Please consider the adult Dutch population. What do you think is the percentage of people that have risky financial assets?”. Elicited in our questionnaire in 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 questionnaire in the LISS panel.

## H.3 Determinants of portfolio choice

**Risk aversion index** We employ a quantitative lottery choice task and a qualitative risk questions for general decisions under risk based on Falk et al. (2022). We use the experimentally validated weights by Falk et al. (2022) to calculate the index such that the qualitative risk component is weighted slightly higher at 53% (after standard normalizing both components). Included in the LISS by Gaudecker, Wogrolly, and Zimpelmann (2021) in May 2021.

**Financial numeracy** We employ the four questions of Rooij, Lusardi, and Alessie (2011) measuring financial numeracy. We count the number of correct answers and standard normalize the measure. Included in the LISS by Gaudecker, Wogrolly, and Zimpelmann (2021) in May 2021.

**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 and a risky option with known winning probability. Included in the LISS by Gaudecker, Wogrolly, and Zimpelmann (2021) in May 2021.

**Likelihood insensitivity** We calculate the index of ambiguity induced likelihood insensitive 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 and a risky option with known winning probability. Included in the LISS by Gaudecker, Wogrolly, and Zimpelmann (2021) in May 2021.

**Belief over stock returns** Following Hurd, Rooij, and Winter (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, Sapienza, and Zingales (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.

#### H.4 Determinants of negative perceptions

**Has made negative experience with risky financial assets** Responded yes to the question “Have you personally had negative experiences with risky financial assets?” Elicited in our questionnaire in the LISS panel.

**“Money is not something you should talk about”** Based on the agreement on a 7-point likert scale to the statement “Money is not something you should talk about”. We create a dummy variable whether the subject responded at least 5 on the scale. Elicited in our questionnaire in the LISS panel.

**Parents invested in risky financial assets** Responded yes to the question “Do or did your parents possess any risky financial assets like stocks? ” Elicited in our questionnaire in the LISS panel.

**Political spectrum** Based on 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?” We categorize all responses of at most 3 as “left political spectrum” and all responses of at least 7 as “right political spectrum”. Obtained from the 2020 politics and values questionnaire of the LISS panel.

**Interested in the news** Responded “very interested” to the question: “Are you very interested in the news, fairly interested or not interested?” Obtained from the 2020 politics and values questionnaire of the LISS panel.

#### H.5 Determinants of political attitudes

**Political spectrum** Based on 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?” We categorize all responses of at most 3 as “left political spectrum” and all responses of at least 7 as “right political spectrum”. Obtained from the 2020 politics and values questionnaire of the LISS panel.

**Opposition to income inequality** Based on the question “Some people believe that differences in income should increase in our country. Others feel that they should decrease. Still others hold an opinion that lies somewhere in between. Where would you place yourself on a scale from 1 to 5, where 1 means that differences in income should increase and 5 means that these should decrease?” Obtained from the 2020 politics and values questionnaire of the LISS panel.

#### H.6 Scales

This section describes the identity and political attitudes towards stock market scales used in Section 5.2 in more detail.

**Identity scale.** Table H.1 provides an overview over the items used for the identity scale. As mentioned in the main text, we selected five items from established group identification scales (Doosje, Ellemers, and Spears, 1995; Klor and Shayo, 2010) and applied them to the stockholder/non-stockholder context. Henkel et al. (2022) show that this scale, used in the context of vaccination identification, is strongly related to the broader identification scale of Leach et al. (2008). Since we defined groups using a risky financial assets categorization (see Footnote 11 of Section 3.1 for justification), the items were defined using this categorization as well. 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”). Consequently, we construct our scale capturing non-stockholder identification by taking the average over all five items.

Table H.1: 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.

**Political attitudes towards stock market scale.** Table H.2 shows the items we used to elicit political preferences toward stockholders and the stock market. As it is common in the literature, we provided subjects with additional explanations for some of the more technical items. These are marked in *italic* in the Table. As before, subjects were asked whether they agree or disagree with the respective statement of each item on a scale from one (“fully disagree”) to seven (“fully agree”). The first item was purposefully designed to be unrelated to the stock market and instead designed to measure subjects’ general distributional preferences in the context of wealth taxation<sup>42</sup>. Therefore, it is not part of the political preferences measure and instead used as a control variable in Table 8. We define our measure capturing subject’s political attitudes toward the stock market as the average over the remaining five items. In doing so, we reverse code the responses to item three so that higher values on the scale indicate political attitudes in favor of non-stockholder compared to stockholder in terms of regularization and taxation.

<sup>42</sup>Note that such a tax currently exists in the Netherlands. In the instructions, we use the commonly used Dutch term for the tax.

Table H.2: Political preferences items

Item	
1	The tax on personal investments and savings should be increased. <i>Currently, the effective tax rate is 0.59% each year for individuals with a net asset value (after deducting tax free amount) below EUR 100,001, 1.39% for a value between EUR 100,001 and EUR 1,000,000, and 1.60% above EUR 1,000,000.</i>
2	Investments in risky financial assets like stocks or funds should be taxed with a higher tax rate than savings on a banking account. <i>Currently, they are taxed with the same tax rate.</i>
3	Investments into stocks and funds for private retirement should be incentivized more strongly by the government, for example, through subsidies or tax exemptions. [Reverse coded]
4	There should be a financial transaction tax introduced to the Netherlands. <i>The financial transaction tax is a small tax applied every time a financial asset (stocks and derivative) is sold. Currently, there is no such tax in the Netherlands.</i>
5	Investment products that enable the betting on prices of staple food should be prohibited.
6	There should be a tax on gains from trading risky financial assets in the Netherlands. <i>Currently, gains from trading risky financial assets are not taxed extra in the Netherlands (except when a substantial interest exists, which is the case when at least 5% of the shares, options or profit-sharing certificates in a company are owned).</i>

## **I Instructions**

### **I.1 LISS panel instructions first wave**

Figure I.1: LISS panel instructions first wave

**Page 1**

Please consider the following three character traits:

**Greedy:** a strong wish to continuously get more of things like wealth, possessions or social values.

**Being a gambler:** a person that shows the tendency to risk money or other stakes in the hope of being successful.

**Selfish:** being willing to accept negative consequences for other people or the environment to gain a personal advantage as a result.

Below you will find three statements concerning the character traits that you can either agree or disagree with. Please indicate to what extent you agree or disagree with each statement. Be as open and honest as possible when answering these questions.

[10-item likert scale from 1 strongly disagree to 10 strongly agree]

I am kind of greedy [info-box: a strong wish to continuously get more of things like wealth, possessions or social values.] [Likert scale]

I am kind of a gambler [info-box: a person that shows the tendency to risk money or other stakes in the hope of being successful.] [Likert scale]

I am kind of selfish [info-box: being willing to accept negative consequences for other people or the environment to gain a personal advantage as a result.] [Likert scale]

Figure I.2: LISS panel instructions first wave

**Page 2**

We now ask you about **other people of the general Dutch population** who take care of financial matters in their household. Consider the population is divided into two groups of people: First, individuals who **possess** any risky financial investments (e.g., stocks or funds [details]). Second, individuals who **do not possess** any risky financial investments. We would like to know **your beliefs** about the individuals in those two groups. Please indicate to what extent you agree or disagree with each statement.

[Details: 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.]

[10-item Likert scale from 1 strongly disagree to 10 strongly agree]

Individuals who **possess** any risky financial investments such as stocks are, on average, ...

kind of greedy [info-box]	[Likert skale]
---------------------------	----------------

kind of gamblers [info-box]	[Likert skale]
-----------------------------	----------------

kind of selfish [info-box]	[Likert skale]
----------------------------	----------------

Individuals who **do not possess** any risky financial investments such as stocks are, on average, ...

kind of greedy [info-box]	[Likert skale]
---------------------------	----------------

kind of gamblers [info-box]	[Likert skale]
-----------------------------	----------------

kind of selfish [info-box]	[Likert skale]
----------------------------	----------------

Figure I.3: LISS panel instructions first wave

**Page 3**

We now would like to know what you think individuals in those two groups **respond on average** to a set of questions **about themselves**.

[10-item Likert scales from 1 strongly disagree to 10 strongly agree]

How do individuals who **possess** any risky financial investments such as stocks answer the following questions on average?

I am kind of greedy [info-box: a strong wish to continuously get more of things like wealth, possessions or social values.] [Likert scale]

I am a gambler [info-box: a person that shows the tendency to risk money or other stakes in the hope of being successful.] [Likert scale]

I am kind of selfish [info-box: being willing to accept negative consequences for other people or the environment to gain a personal advantage as a result.] [Likert scale]

How do individuals who **do not possess** any risky financial investments such as stocks answer the following questions on average?

I am kind of greedy [info-box] [Likert scale]

I am kind of a gambler [info-box] [Likert scale]

I am kind of selfish [info-box] [Likert scale]



Figure I.4: LISS panel instructions first wave

**Page 4**

Do you possess any risky financial investments (e.g., stocks or funds)?

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.

(Partners often have assets in both their names. If that is the case, do not count only assets that are in your name, but also those that are in both your names.)

Figure I.5: LISS panel instructions first wave

Page 5

[Only in the October part of the first wave]

Finally, the last six questions.

[Yes/No answers]

Are you currently doing volunteer work or have you done so in the past 2 years?

In the past 2 years, have you helped a stranger who needed help?

Have you ever bought a product that you did not really need, just because you wanted it?

In the past 2 years, have you felt dissatisfied because you wanted to own more things?

Have you ever lost money in a casino?

Have you ever been in a situation where you regretted taking too much risk?

## I.2 LISS panel instructions second wave

Figure I.6: LISS panel instructions second wave

### Page 1

The questionnaire is about your estimations on people who **do** have risky financial investments (such as stocks or funds [details]) and people who **do not** have risky investment.

[Details: Risky financial investments include growth funds, share funds, bonds, debentures, stocks, options, warrants. They do not include banking accounts, saving accounts, bank savings schemes, insurance policies, or real estate.]

We would like to know your assessment **separately** for two different groups. Suppose all Dutch people over 18 who are in charge of the financial affairs of their household were to be divided into two groups: First, individuals who **possess** any risky financial investments. Second, individuals who **do not possess** any risky financial investments.

Please state for each group separately, what you think the share of people that do/did the activities listed below in the respective group is.

For example, if you enter in the second column of the table below a share of 0%, that means you think out of all people who possess risky financial assets, no one does this activity, while entering a share of 50% means you believe half of the people of this group do this activity.

What do you think, what is the share of people (0% - 100%) that...	Out of the group of people that <b>possess</b> risky financial assets.	Out of the group of people that <b>do not possess</b> risky financial assets.
...stated that they are currently doing voluntary work or have done so in the past 2 years?		
...stated that they helped a stranger in need at some point in the past 2 years?		
... stated that they at least once bought a product out of greed, when they didn't really need it?		

Figure I.7: LISS panel instructions second wave

**Page 2**

**Information**

On the previous page, we asked you to guess how many people with and without risky investments stated to do the activities “voluntary work”, “helping strangers” and “unnecessary buying”. Some time ago, we also asked you in another survey about how people of the general Dutch population would answer questions related to the three characteristics “greedy”, “gambler” and “selfish”. The characteristics were explained to you as follows:

**Greedy:** a strong wish to continuously get more of things like wealth, possessions or social values.

**Being a gambler:** a person that shows the tendency to risk money or other stakes in the hope of being successful.

**Selfish:** being willing to accept negative consequences for other people or the environment to gain a personal advantage as a result.

You then had the opportunity to guess how people would agree to a statement related to each of the three characteristics on a scale from 0 to 10. Like on the last page, we have asked you separately for two different groups of people: Those that own risky financial assets (such as stocks or funds) and those that do not own such assets.

As part of a research project, we recently surveyed about 2800 people in the Netherlands that take care of financial matters in their households. Respondents came from all parts of the adult population and their responses represent the views and attitudes of people in the Netherlands. As such they are representative for the two groups of people.

For the characteristics “greedy”, “gambler” and “selfish”, each person stated their level of agreement on a scale from 0 to 10, where 0 means “totally disagree” and 10 means “totally agree” to the statements.

For the characteristics ‘greedy’, ‘gambler’ and ‘selfish’, we asked you whether people with and without risky investments would disagree or agree with different statements. You were asked to do this on a scale of 0 to 10, where 0 meant “totally disagree” and 10 meant “totally agree”. These were the statements:

- “I am kind of greedy”
- “I am kind of a gambler”
- “I am kind of selfish”

The characteristics were described to them in the same way they were described to you.

For the three activities “voluntary work”, “helping strangers” and “unnecessary buying”, we asked each person whether they...

For three activities “voluntary work”, “helping strangers” and “unnecessary buying”, we asked you to consider whether people with and without risky investments...

- ... do any kind of voluntary work or have done so in the past 2 years.
- ... at some point in the past 2 years helped a stranger who needed help.
- ... at least once bought a product which they didn't really need just for the sake of having it.

Hence, the 2800 surveyed people answered exactly the questions for which we asked you to guess their answers. On the next pages, we will show you how your beliefs compare to the actual answers that people gave for the two groups of people. Please consider this information carefully.

On the next pages, we will show you what your estimates of the differences between the two groups of people were. Please consider this information carefully.

Figure I.8: LISS panel instructions second wave

Page 3

We have analysed the data of the 2800 people from the Netherlands for the previously mentioned two groups of people.

As described before, we have asked you for the two previously mentioned groups of people:

Those that own risky investments (such as stocks or funds) and those that do not own risky investments.

In the following we consider the average difference between these two groups for the characteristics “greedy”, “gambler” and “selfish”. That is, how much the people of the two groups differ in these three characteristics.

We will now show you information that relates to the following questions:

- How big a difference do you estimate the difference between the two groups to be i.e. the difference between people who own risky financial assets compared to those that do not?

→ You can find **your estimate of the difference** for each characteristic **in blue** in the graph below. The higher the value shown, the greedier/more like a gambler/more selfish you thought people with risky investments were compared to people without.

- What are the actual differences between the two groups, how different are they in truth?

→ You will find the **actual difference** for each characteristic **in black** next to your estimates in the graph.

Please click on the green button below the graph to reveal your estimates **and the true differences** for each characteristic.

[Graphic]

Click <here> if you need further help on how to read the graph.

Figure I.9: LISS panel instructions second wave

Page 4

We will now show you the differences for the three activities “voluntary work”, “helping strangers” and “unnecessary buying”. That is, how much, you estimated, the people of the two groups differ in their likelihood to do voluntary work, help strangers and buy products they don't really need.

As before, you will see in **blue** what **you thought** the difference were between those people that own risky financial assets (such as stocks or funds) and those that do not for each activity. **In black you can see how large the differences actually are.**

Please click again on the green button below the graph to reveal the results.

[Graphics]

Click [here](#) if you need further help on how to read the graph.

Figure I.10: LISS panel instructions second wave

**Page 5**

We now would like to know what you **personally** think about the individuals in the previously mentioned two groups, i.e. the group of individuals that possess any risky financial investments (e.g., stocks or funds) and those that do not possess any risky financial investments.

Please state your personal opinion by indicating to what extent you agree or disagree with each statement on a scale of 0 (totally disagree) to 10 (totally agree). The statements concern the following three characteristics:

**Greedy:** a strong wish to continuously get more of things like wealth, possessions or social values.

**Being a gambler:** a person that shows the tendency to risk money or other stakes in the hope of being successful.

**Selfish:** being willing to accept negative consequences for other people or the environment to gain a personal advantage as a result.

[10-item Likert scale from 1 strongly disagree to 10 strongly agree]

Individuals who possess any risky financial investments such as stocks are, on average, ...

... kind of greedy

... kind of gamblers

... kind of selfish

Individuals who **do not** possess any risky financial investments such as stocks are ...

... kind of greedy

... kind of gamblers

... kind of selfish

Figure I.11: LISS panel instructions second wave

**Page 6**

Investment Decision

In this section you can potentially earn real money. You will receive EUR 100 that you can divide between two investments. The two investments are as follows:

- **Bank account:** You put the money in a standard bank account that pays no interest. For every Euro deposited in the bank account you receive exactly one Euro in one year.
- **Risky investment:** You participate in the stock market by investing in an index fund for the AEX. The AEX is the most important stock market index in the Netherlands and consists of the share prices of many large Dutch companies. The index fund tracks the AEX (click here for more details), that is, this investment rises and falls exactly with the AEX, after deducting relatively low costs. For every Euro invested in the index fund for the AEX, you will receive the following after one year:
  - 1 Euro - 0.3 cent costs (0.3%) + change in the AEX (positive or negative).
  - For example, if you invest 10 Euros in the index fund and the AEX rises by 5%, you will receive 10.47 Euro. If the AEX drops by 5%, you will receive 9.47 Euro.

At the end of the experiment, 16 participants are randomly selected. Each participant has the same chance of being selected and the decisions of the selected participants are actually implemented. Based on your answer to the next question, the researchers implement the corresponding investment for you. In one year, they will take the money out of the investment for you and transfer it to your account. That is, if you are one of the selected participants, CentERdata will transfer the 100 Euros plus the potential gains made or minus the losses incurred from your investment to you on behalf of the researchers.

Would you like to invest any of the 100 Euros in the risky investment? If you select yes, you can choose how much you would like to invest. If you select no, you invest 0 Euro in the stock market and put 100 Euro in the bank account. Think carefully about your decision. When you are selected for payout, the investment will actually be made.

Yes/No

Of the 100 Euros, how much would you like to put in the bank account and how much would you like to invest in the stock market via the index fund?

[Slider]



Figure I.12: LISS panel instructions second wave

**Page 7**

In the next six months, how likely is it that you will invest some of your own money into risky financial assets such as stocks or funds? Please answer this question on a scale from 0 to 100, where 0 stands for “definitely not” and 100 for “definitely yes”.

[0-100 entry field]

Figure I.13: LISS panel instructions second wave

**Page 8**

Please indicate on a scale from 1 to 7, where 1 means "fully disagree" and 7 "fully agree", how much you agree or disagree with the following statement:

**I will not, under any circumstances or situations whatsoever, invest any of my own money into risky financial assets such as stocks or funds in the next five years.**

[1-7 likert scale agree/disagree]

Figure I.14: LISS panel instructions second wave

**Page 9**

Whether or not you plan to invest in the stock market, it may be a good idea to read up on it.

The VEB is a non-profit association and an important source for independent investment information. They put together some useful information about how individual investors can invest in the stock market. If you wish, you can receive this information at the end of the survey. You will be able to download the information with one click for further usage.

Please select if you would like to receive the information at the end of the survey.

Yes/No

Figure I.15: LISS panel instructions second wave

**Page 10**

Please indicate on a scale from 1 to 7, where 1 means "fully disagree" and 7 "fully agree", how much you agree or disagree with the following statements:

**The tax on personal investments and savings (private wealth) should be increased.**

Currently, the effective tax rate is 0.59% per year for individuals with a net asset value (after deducting the tax free amount) below EUR 100,001, 1.39% for a value between EUR 100,001 and EUR 1,000,000, and 1.60% above EUR 1,000,000.

**Investments in risky financial assets such as stocks or funds should be taxed at a higher tax rate than savings in a bank account.**

Currently, they are taxed with the same tax rate.

**Investments in shares and funds for private retirement should be incentivized more strongly by the government, for example, through subsidies or tax exemptions.**

**There should be a financial transaction tax introduced to the Netherlands.**

The financial transaction tax is a small tax applied whenever a financial asset (shares and derivative) is sold. Currently, there is no such tax in the Netherlands.

**Investment products that enable the betting on prices of staple food should be prohibited.**

**There should be a tax on profits from trading in risky financial assets in the Netherlands.**

Currently, profits from trading in risky financial assets are not additionally taxed in the Netherlands (except when a substantial interest exists, which is the case when at least 5% of the shares, options or profit-sharing certificates in a company are owned).

[1-7 Likert scale agree/disagree]

Figure I.16: LISS panel instructions second wave

**Page 11**

In each of the situations below, how would you divide 100 Euros between two persons, who are part of different groups? The closer you drag the slider to one individual, the more money you allocate to that individual. Important: Please assume all individuals below have the same income and wealth, and would not find out that it was you who sent them the money.

- Divide 100 Euros between a member of one of your past or current organizations (local church, leisure club or association, etc.) and a randomly-selected person from the Netherlands
- Divide 100 Euros between a randomly-selected person from the Netherlands and a randomly-selected person from anywhere in world
- Divide 100 Euros between someone who speaks Dutch and lives anywhere in the world and a randomly-selected person from anywhere in world

[Slider 0 -100]

Figure I.17: LISS panel instructions second wave

**Page 12**

For the next decision, we randomly selected two other participants from the LISS panel who take care of financial matters in the household. Both have the same income and wealth, but one of these persons reported during a previous questionnaire that he/she owns risky financial assets while the other one reported not owning risky financial assets.

Below, we ask you to divide 100 Euros between these two persons. Your choice can have real consequences as the choice of one randomly selected participant is actually paid out to the two persons described above. Please note that this decision is about two other individuals, your choice in this decision will thus not affect your own payments in any way. The individuals will also never find out that it was you who sent them the money.

The closer you drag the slider to one person, the more money you allocate to that individual.

- Divide 100 Euros between the person from the panel who reported to own risky financial assets during a previous questionnaire and the person from the panel who reported not to own risky financial assets.

[Slider 0 -100]

Figure I.18: LISS panel instructions second wave

**Page 13**

Please indicate on a scale from 1 to 7, where 1 means "fully disagree" and 7 "fully agree", how much you agree or disagree with the following statement:

- Not having risky financial assets is an important part of my identity.
- I am proud to not have risky financial assets.
- When a person or the media criticizes people for not having risky financial assets it feels like a personal insult.
- I have very little in common with people that have risky financial assets.
- If I would learn of a person that he/she owns risky financial assets, I would immediately feel less connected to that person.

[1-7 Likert scale agree/disagree]

Figure I.19: LISS panel instructions second wave

**Page 14**

Please indicate on a scale from 1 to 7, where 1 means "fully disagree" and 7 "fully agree", how much you agree or disagree with the following statements:

- I am not perfectly sure what kind of person I am
- The opinion that others have of me is very important to me
- I do not want to be seen by others as someone who owns risky financial assets

People often think about their self-image, which means the personal view, or mental picture, that everyone has of themselves. For example, some people view themselves as being a good friend or a helpful person.

- When making decisions, I often think about what the alternatives mean for the self-image

Please consider the following two hypothetical situations and answer for each one, how much you agree or disagree with the respective statement for the situation.

Situation 1: Everyone you know would be informed on whether you are investing in risky financial assets

- In this situation, I could imagine myself investing in risky financial assets at some point in the future.

Situation 2: No one you know would find out whether you are investing in risky financial assets

- In this situation, I could imagine myself investing in risky financial assets at some point in the future.

[1-7 Likert scale agree/disagree]



Figure I.20: LISS panel instructions second wave

**Page 15**

Please indicate, on a scale from 0 to 10, where 0 means "No trust at all" and 10 "Full trust", how much you personally trust people from each of the following occupations.

- Politicians
- Bankers
- Financial advisors
- Insurance agents
- Doctors

[0-10 Likert scale]

Figure I.21: LISS panel instructions second wave

**Page 16**

Consider the Dutch stock market. As a reminder, the Amsterdam Exchange index (AEX) is the total of share prices of many large Dutch companies. How much do you expect an investment of 100 Euros in the AEX to be worth in a year's time? Please indicate the amount in euros.

[Integer field, min at 0]

Please consider the adult Dutch population. What do you think is the percentage of people that have risky financial assets?

[Integer field 0-100]

Figure I.22: LISS panel instructions second wave

**Page 17**

Please indicate on a scale from 1 to 7, where 1 means "fully disagree" and 7 "fully agree", how much you agree or disagree with the following statements:

- At the moment, I am confident in my knowledge about how the stock market works
- In financial investments, it is often the case that when one person gains something, another person must necessarily lose
- I currently do not have what it takes to be successful in trading on the stock market
- Money is not something you should talk about

[1-7 Likert scale agree/disagree]

Figure I.23: LISS panel instructions second wave

**Page 18**

We would like to know what you personally think of individuals of certain groups. Please indicate for each group of people whether you would agree or disagree with the statement that they are, on average, **actually selfish** on a scale from 0 (fully disagree) to 10 (fully agree).

Individuals who only invest into risky financial assets that comply with the Socially Responsible Investment (SRI) guidelines. Such guidelines prohibit, for example, investments into companies involved in environmental destruction or military suppliers.

Individuals who use financial derivatives that carry high risks such as options, swaps or warrants.

Individuals who have risky financial assets only in form of investments in market index funds. A market index fund mechanically tracks the movements of stock market indices like e.g. the AEX.

[10-item Likert scale]

Figure I.24: LISS panel instructions second wave

**Page 19**

How often do you talk to people outside your household about how they invest their money?

"Never", "Once a year", "Once a month", "Once a week", "Several times a week"

Have you personally had negative experiences with risky financial assets? yes/no

Do or did your parents possess any risky financial assets like stocks? yes/no

How many friends do you have who you know own risky financial assets? 0/1 to 3/4 to 6/6 to 10/ More than 10

Do you possess any risky financial investments (e.g., stocks or funds [details])?

A couple of pages ago we showed you a graph. The graph showed the difference in the likelihood that people who own risky financial assets do voluntary work compared to people that do not own risky financial assets. Which of the following statements concerning the actual difference (not what you thought) was displayed in the graph?

- People with risky financial assets are, on average, more likely to do voluntary work
- People with risky financial assets are, on average, less likely to do voluntary work
- People with risky financial assets are, on average, just as likely to do voluntary work
- I do not recall what was shown

### I.3 Description experiment instructions

Figure I.25: Description experiment instructions

#### Welcome!

Thank you for your interest in completing this survey. By completing the survey, you help us understand how people in the U.S. think about important questions.

To participate in the survey, you have to live in the U.S. and be 18 years or older. The survey will take about 7 minutes to complete. It is part of a research study conducted by researchers of the University of Bonn.

It is very important for the quality of our research that you answer honestly and read the questions carefully before answering. Your participation is entirely voluntary and you may withdraw from participation at any time during the survey, without providing any reasons. However, in order to use your data for research and pay you, it is necessary that you complete the entire survey.

There are several situations in this survey in which you have a chance to earn bonus money. These are marked with the sign:



In each situation, you are asked to make a decision. Your decision in one of the marked situations might have real consequences. The others are hypothetical.

After the study is completed, a computer will randomly choose 10 participants. For these participants, the situation with real consequences is implemented, resulting in bonus money. You will not be told beforehand which decision could result in real consequences, so all of your decisions are important.

You will receive all necessary details on the situations before you are asked to make decisions.

I have read and understood the above and want to participate in this study.

- ☐ Yes  
☐ No

Figure I.26: Description experiment instructions

## Decision 1

Suppose you are given £10 (\$1 = £0.81) and can choose between two options:

**Option A:** Use the £10 to participate in a random draw and receive one of two outcomes as additional payment:

- Outcome 1: **£7**
- Outcome 2: **£20**

This works as follows: A computer randomly selects an outcome (1 or 2). Each outcome has the same chance of being selected. That is, the probability that Outcome 1 is selected is 50%, and the probability that Outcome 2 is selected is also 50%.

Accordingly, this random draw has an [expected value](#) of **£13.5**.

**Option B:** Do not use the £10 to participate in the random draw. You then receive the **£10** as additional payment.

### Your Choice

Which option do you choose?

- ☐ Option A: I want to participate in the random draw
- ☐ Option B: I do not want to participate in the random draw

Confirm decision

Figure I.27: Description experiment instructions

## Decision 2

Suppose you are given £10 as in the previous situation and can choose between two options:

**Option A:** Use the £10 to participate in a random draw and receive one of two outcomes as additional payment:

- Outcome 1: **£4**
- Outcome 2: **£25**

This works as follows: A computer randomly selects an outcome (1 or 2). Each outcome has the same chance of being selected. That is, the probability that Outcome 1 is selected is 50%, and the probability that Outcome 2 is selected is also 50%.

Accordingly, this random draw has an [expected value](#) of **£14.5**.

**Option B:** Do not use the £10 to participate in the random draw. You then receive the **£10** as additional payment.

### Your Choice

Which option do you choose?

- ☐ Option A: I want to participate in the random draw
- ☐ Option B: I do not want to participate in the random draw

Confirm decision



Figure I.28: Description experiment instructions



## Instructions

---

In this section, you will make 4 decisions. In each decision, you will separately receive £24.3 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.

Note that each decision is going to have the bonus sign. Your choices thus have a chance of being implemented.

Next

Figure I.29: Description experiment instructions



## Decision 1

You have £24.3. You can choose whether to participate in a random draw (Option A) or not (Option B). We start by explaining Option A.

**Option A:** Participate in a random draw by buying a ticket. The random draw yields different outcomes. Each outcome pays a different prize.

Below you can see the prizes that come with the potential outcomes of the random draw. Each row represents one prize for a potential outcome. The first row shows the price to which you can buy the ticket.

Prize in Pound	
<b>Buying Price</b>	<b>£7.59</b>
Outcome 1	£6.74
Outcome 2	£18.11

**Consequences of Option A:** If you choose Option A, you buy the ticket at a price of **£7.59**. You receive the money not used for the ticket,  $£24.3 - £7.59 = \textbf{£16.71}$ , as additional payment with certainty. Additionally, you receive further money depending on the outcomes of a random draw.

This works as follows: A computer randomly selects an outcome (1 or 2). Each outcome has the same chance of being selected. You then additionally receive the prize of the selected outcome as payment on top of the money that was not used to buy the ticket.

Accordingly, this ticket has an expected value of £12.43. Together with the money not used (£16.71), in [expectation](#) you receive **£29.14** from choosing Option A.

**Option B:** Do not participate in the random draw.

**Consequences of Option B:** If you choose Option B, you receive the £24.3 as additional payment. Your payment does not depend on the outcome of the random draw in this case.

### Your Choice

Which option do you choose?

- ☐ Option A: I want to participate in the random draw
- ☐ Option B: I do not want to participate in the random draw

Confirm decision

Figure I.30: Description experiment instructions



## Decision 2

You have £24.3. This decision features a different random draw with a different price and outcomes than before. Accordingly, you can choose whether to participate in a random draw (Option A) or not (Option B). We start by explaining Option A.

**Option A:** Participate in a random draw by buying a ticket. The random draw yields different outcomes. Each outcome pays a different prize.

Below you can see the prizes that come with the potential outcomes of the random draw. Each row represents one prize for a potential outcome. The first row shows the price to which you can buy the ticket.

Prize in Pound	
<b>Buying Price</b>	<b>£23.55</b>
Outcome 1	£22.86
Outcome 2	£34.43

**Consequences of Option A:** If you choose Option A, you buy the ticket at a price of **£23.55**. You receive the money not used for the ticket,  $£24.3 - £23.55 = \text{£}0.75$ , as additional payment with certainty. Additionally, you receive further money depending on the outcomes of a random draw.

This works as follows: A computer randomly selects an outcome (1 or 2). Each outcome has the same chance of being selected. You then additionally receive the prize of the selected outcome as payment on top of the money that was not used to buy the ticket.

Accordingly, this ticket has an expected value of £28.64. Together with the money not used (£0.75), in [expectation](#) you receive **£29.39** from choosing Option A.

**Option B:** Do not participate in the random draw.

**Consequences of Option B:** If you choose Option B, you receive the £24.3 as additional payment. Your payment does not depend on the outcome of the random draw in this case.

### Your Choice

Which option do you choose?

- ☐ Option A: I want to participate in the random draw
- ☐ Option B: I do not want to participate in the random draw

Confirm decision

Figure I.31: Description experiment instructions



## Decision 3

You have £24.3. This decision features a different random draw with a different price and outcomes than before. Accordingly, you can choose whether to participate in a random draw (Option A) or not (Option B). We start by explaining Option A.

**Option A:** Participate in a random draw by buying a ticket. The random draw yields different outcomes. Each outcome pays a different prize.

Below you can see the prizes that come with the potential outcomes of the random draw. Each row represents one prize for a potential outcome. The first row shows the price to which you can buy the ticket.

Prize in Pound	
<b>Buying Price</b>	<b>£17.13</b>
Outcome 1	£15.16
Outcome 2	£37.34

**Consequences of Option A:** If you choose Option A, you buy the ticket at a price of **£17.13**. You receive the money not used for the ticket,  $£24.3 - £17.13 = \textbf{£7.17}$ , as additional payment with certainty. Additionally, you receive further money depending on the outcomes of a random draw.

This works as follows: A computer randomly selects an outcome (1 or 2). Each outcome has the same chance of being selected. You then additionally receive the prize of the selected outcome as payment on top of the money that was not used to buy the ticket.

Accordingly, this ticket has an expected value of £26.25. Together with the money not used (£7.17), in [expectation](#) you receive **£33.42** from choosing Option A.

**Option B:** Do not participate in the random draw.

**Consequences of Option B:** If you choose Option B, you receive the £24.3 as additional payment. Your payment does not depend on the outcome of the random draw in this case.

### Your Choice

Which option do you choose?

- ☐ Option A: I want to participate in the random draw
- ☐ Option B: I do not want to participate in the random draw

Confirm decision

Figure I.32: Description experiment instructions



## Decision 4

You have £24.3. This decision features a different random draw with a different price and outcomes than before. Accordingly, you can choose whether to participate in a random draw (Option A) or not (Option B). We start by explaining Option A.

**Option A:** Participate in a random draw by buying a ticket. The random draw yields different outcomes. Each outcome pays a different prize.

Below you can see the prizes that come with the potential outcomes of the random draw. Each row represents one prize for a potential outcome. The first row shows the price to which you can buy the ticket.

Prize in Pound	
<b>Buying Price</b>	<b>£21.52</b>
Outcome 1	£20.33
Outcome 2	£32.46

**Consequences of Option A:** If you choose Option A, you buy the ticket at a price of **£21.52**. You receive the money not used for the ticket,  $£24.3 - £21.52 = \textbf{£2.78}$ , as additional payment with certainty. Additionally, you receive further money depending on the outcomes of a random draw.

This works as follows: A computer randomly selects an outcome (1 or 2). Each outcome has the same chance of being selected. You then additionally receive the prize of the selected outcome as payment on top of the money that was not used to buy the ticket.

Accordingly, this ticket has an expected value of £26.39. Together with the money not used (£2.78), in [expectation](#) you receive **£29.17** from choosing Option A.

**Option B:** Do not participate in the random draw.

**Consequences of Option B:** If you choose Option B, you receive the £24.3 as additional payment. Your payment does not depend on the outcome of the random draw in this case.

### Your Choice

Which option do you choose?

- ☐ Option A: I want to participate in the random draw
- ☐ Option B: I do not want to participate in the random draw

Confirm decision

Figure I.33: Description experiment instructions

## Questions

---

What is the highest level of education you have completed?

Which of these describes your current employment situation most accurately?

Please think about your household income from all sources in 2021. Which category represents your total net household annual income (after taxes) in 2021?

In which region of the US do you currently reside?

Do you take care of financial matters in your household?

☐ Yes

☐ No

Next

Figure I.34: Description experiment instructions



## Instructions

---

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.

Note that each decision is going to have the bonus sign. Your choices thus have a chance of being implemented.

Next

Figure I.35: Description experiment instructions

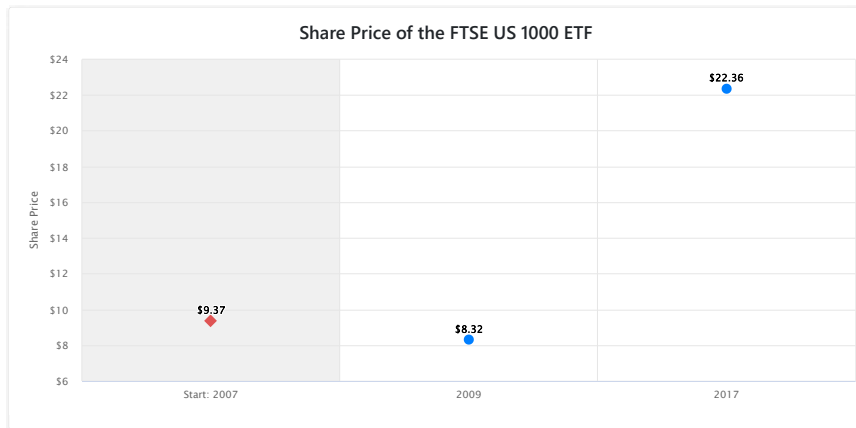


## Decision 1

You have \$30. You can choose whether to participate in the stock market (Option A) or not (Option B). We start by explaining Option A.

**Option A:** Participate in the stock market by buying a share of an exchange-traded fund (ETF) that replicates the FTSE US 1000 index.

Below you can see how the price of a share of the ETF has developed in the years 2007, 2009 and 2017. Each point represents the [actual](#) price (displayed on the vertical axis) in a particular year (displayed on the horizontal axis). The first point shows the price to which you can buy the share.



**Consequences of Option A:** If you choose Option A, you buy in the year 2007 the share of the ETF that replicates the FTSE US 1000 index to the corresponding price of **\$9.37**. You receive the money not invested in the stock market,  $\$30 - \$9.37 = \mathbf{\$20.63}$ , as additional payment with certainty. Additionally, you receive further money depending on the movement of the stock market.

This works as follows: A computer randomly selects one of the two selling years (2009 or 2017). Each year has the same chance of being selected. At the selected selling year, the share you bought will be sold. You then additionally receive the price of the share at the selected year as payment on top of the money that was not invested.

Accordingly, this investment has an expected value of \$15.34. Together with the money not invested (\$20.63), in [expectation](#) you receive **\$35.97** from choosing Option A.

**Option B:** Do not participate in the stock market.

**Consequences of Option B:** If you choose Option B, you receive the \$30 as additional payment. Your payment does not depend on the movement of the stock market in this case.

### Your Choice

Which option do you choose?

- ☐ Option A: I want to participate in the stock market
- ☐ Option B: I do not want to participate in the stock market

Confirm decision



Figure I.36: Description experiment instructions

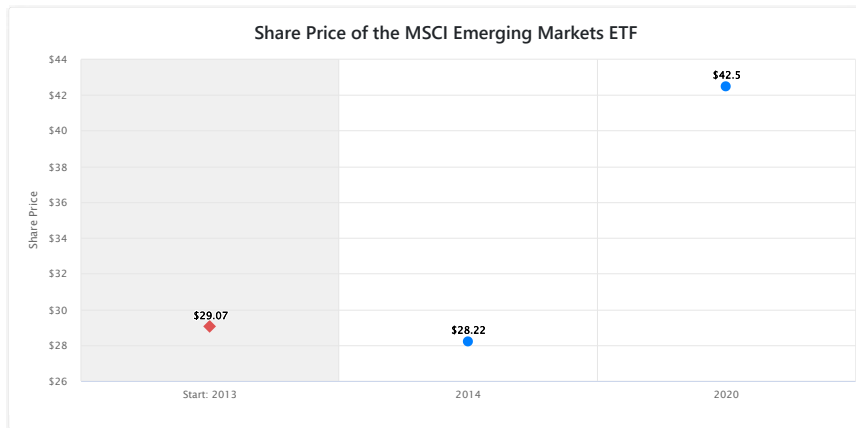


## Decision 2

You have \$30. This decision features a different share of an exchange-traded fund with different prices than before. Accordingly, you can choose whether to participate in the stock market (Option A) or not (Option B). We start by explaining Option A.

**Option A:** Participate in the stock market by buying a share of an exchange-traded fund (ETF) that replicates the MSCI Emerging Markets index.

Below you can see how the price of a share of the ETF has developed in the years 2013, 2014 and 2020. Each point represents the [actual](#) price (displayed on the vertical axis) in a particular year (displayed on the horizontal axis). The first point shows the price to which you can buy the share.



**Consequences of Option A:** If you choose Option A, you buy in the year 2013 the share of the ETF that replicates the MSCI Emerging Markets index to the corresponding price of **\$29.07**. You receive the money not invested in the stock market,  $\$30 - \$29.07 = \$0.93$ , as additional payment with certainty. Additionally, you receive further money depending on the movement of the stock market.

This works as follows: A computer randomly selects one of the two selling years (2014 or 2020). Each year has the same chance of being selected. At the selected selling year, the share you bought will be sold. You then additionally receive the price of the share at the selected year as payment on top of the money that was not invested.

Accordingly, this investment has an expected value of \$35.36. Together with the money not invested (\$0.93), in [expectation](#) you receive **\$36.29** from choosing Option A.

**Option B:** Do not participate in the stock market.

**Consequences of Option B:** If you choose Option B, you receive the \$30 as additional payment. Your payment does not depend on the movement of the stock market in this case.

### Your Choice

Which option do you choose?

- ☐ Option A: I want to participate in the stock market
- ☐ Option B: I do not want to participate in the stock market

Confirm decision

Figure I.37: Description experiment instructions

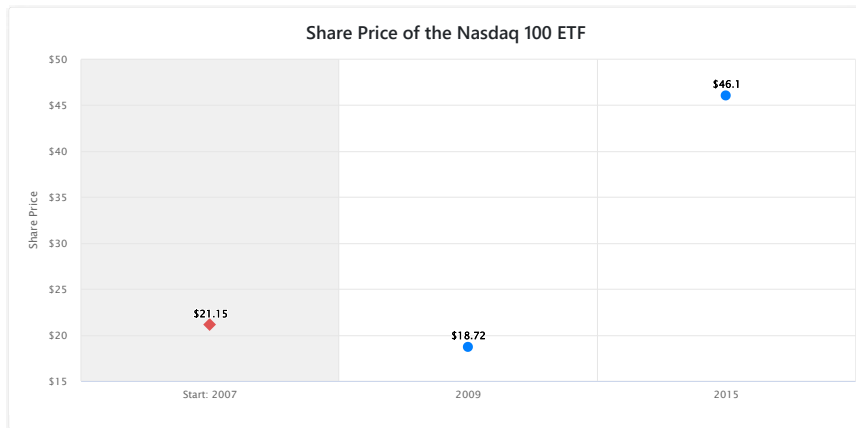


### Decision 3

You have \$30. This decision features a different share of an exchange-traded fund with different prices than before. Accordingly, you can choose whether to participate in the stock market (Option A) or not (Option B). We start by explaining Option A.

**Option A:** Participate in the stock market by buying a share of an exchange-traded fund (ETF) that replicates the Nasdaq 100 index.

Below you can see how the price of a share of the ETF has developed in the years 2007, 2009 and 2015. Each point represents the [actual](#) price (displayed on the vertical axis) in a particular year (displayed on the horizontal axis). The first point shows the price to which you can buy the share.



**Consequences of Option A:** If you choose Option A, you buy in the year 2007 the share of the ETF that replicates the Nasdaq 100 index to the corresponding price of **\$21.15**. You receive the money not invested in the stock market,  $\$30 - \$21.15 = \$8.85$ , as additional payment with certainty. Additionally, you receive further money depending on the movement of the stock market.

This works as follows: A computer randomly selects one of the two selling years (2009 or 2015). Each year has the same chance of being selected. At the selected selling year, the share you bought will be sold. You then additionally receive the price of the share at the selected year as payment on top of the money that was not invested.

Accordingly, this investment has an expected value of \$32.41. Together with the money not invested (\$8.85), in [expectation](#) you receive **\$41.26** from choosing Option A.

**Option B:** Do not participate in the stock market.

**Consequences of Option B:** If you choose Option B, you receive the \$30 as additional payment. Your payment does not depend on the movement of the stock market in this case.

#### Your Choice

Which option do you choose?

- ☐ Option A: I want to participate in the stock market
- ☐ Option B: I do not want to participate in the stock market

Confirm decision

Figure I.38: Description experiment instructions

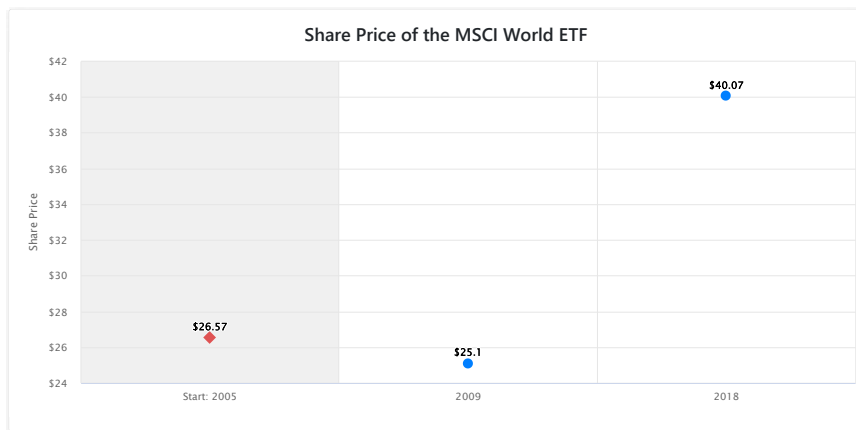


## Decision 4

You have \$30. This decision features a different share of an exchange-traded fund with different prices than before. Accordingly, you can choose whether to participate in the stock market (Option A) or not (Option B). We start by explaining Option A.

**Option A:** Participate in the stock market by buying a share of an exchange-traded fund (ETF) that replicates the MSCI World index.

Below you can see how the price of a share of the ETF has developed in the years 2005, 2009 and 2018. Each point represents the [actual](#) price (displayed on the vertical axis) in a particular year (displayed on the horizontal axis). The first point shows the price to which you can buy the share.



**Consequences of Option A:** If you choose Option A, you buy in the year 2005 the share of the ETF that replicates the MSCI World index to the corresponding price of **\$26.57**. You receive the money not invested in the stock market,  $30 - 26.57 = \mathbf{\$3.43}$ , as additional payment with certainty. Additionally, you receive further money depending on the movement of the stock market.

This works as follows: A computer randomly selects one of the two selling years (2009 or 2018). Each year has the same chance of being selected. At the selected selling year, the share you bought will be sold. You then additionally receive the price of the share at the selected year as payment on top of the money that was not invested.

Accordingly, this investment has an expected value of \$32.59. Together with the money not invested (\$3.43), in [expectation](#) you receive **\$36.02** from choosing Option A.

**Option B:** Do not participate in the stock market.

**Consequences of Option B:** If you choose Option B, you receive the \$30 as additional payment. Your payment does not depend on the movement of the stock market in this case.

### Your Choice

Which option do you choose?

- ☐ Option A: I want to participate in the stock market
- ☐ Option B: I do not want to participate in the stock market

Confirm decision

Figure I.39: Description experiment instructions

## Questions

Which category represents your current total balance (the total value) of your bank accounts (i.e., payment accounts, savings account(s), deposit account(s), savings passbook(s), savings bonds, savings certificates and savings notes and bank savings) at the moment?

-----

Do you possess any risky financial investments?

Risky financial investments include stocks, options, growth funds, share funds, bonds, debentures and warrants. They do not include banking accounts, saving accounts, bank savings schemes, insurance policies, or real estate.

- ☐ Yes  
☐ No

If you answered "No" to the previous question, you can skip this question.

Which category represents your current total balance (the total value) of your risky financial investments (stocks, options, growth funds, share funds, bonds, debentures and warrants) at the moment?

-----

### In general, how willing or unwilling you are to take risks?

Please use the following scale from 0 to 10, where 0 means you are "completely unwilling to take risks" and 10 means you are "very willing to take risks."

Completely  
unwilling to  
take risks

☐ 0   ☐ 1   ☐ 2   ☐ 3   ☐ 4   ☐ 5   ☐ 6   ☐ 7   ☐ 8   ☐ 9   ☐ 10

Very willing  
to take risks

Next

Figure I.40: Description experiment instructions

## End of Survey

---

Thank you very much for completing the survey!

Click on the following link to return to Prolific: [Link to Prolific](#).

## I.4 Information experiment instructions

Figure I.41: Information experiment instructions

The following part is about a decision recently presented to a large number of people in the US who, just like you, participate in online surveys on Prolific.

These participants were given \$100 from us. They could divide this money freely between themselves and a charitable organization that helps and supports children with critical illnesses. Each dollar that they distributed to themselves would be given to them as additional payment. Each dollar that they distributed to the charity would be donated.

**This decision was not hypothetical:** All participants knew that after making their decision, a randomly selected subset of participants would get their decision implemented with real consequences. Since the decision thus led to actual payments and donations, the participants took it very seriously.

Next

Figure I.42: Information experiment instructions

The decision of how much to donate to a charity in such a situation has been found to be strongly associated with people's behavior in relevant real-life situations and their general personality.

For example, the people that donate less, also tend to be less supportive of their friends and relatives and less willing to help people in need. They are also less likely to engage in voluntary work for a good cause. Conversely, the more people donate, the more they tend to be supportive, helpful, and willing to work voluntarily.

It is also well established that the donation decision is related to how egoistic, self-centered, and greedy a person is. The less people donate, the more egoistic and greedy they are. That is, the decision is indicative of people's pattern of thinking and feelings alongside these characteristics.

To summarize, the result of many research studies is the following: The more people donate money to a good cause when given an amount to freely distribute, the more they care about the well-being of other people in general and act to improve it. Note that this finding is not driven by differences in people's financial situation. For example, comparing people with the same income, it is well documented that people who donate more also generally care more about others.

Next

Figure I.43: Information experiment instructions

Out of all the people who made the previously described decision, a computer randomly selected 10 **stockholders**. Being a stockholder means these people indicated that they participate in the stock market by holding risky financial assets such as stocks or funds ([click for details](#)). Further, a computer randomly selected 10 **non-stockholders** with a similar level of annual income as the **stockholders**. Accordingly, **non-stockholders** do not participate in the stock market.

We are now interested in what you believe about the donation behavior of these two groups. Do you think the group of **non-stockholders** donated on average more to the charity than the group of **stockholders** or was it the other way around? Or do you think they donated the same amount? Keep in mind that both groups have a similar level of income.

- ☐ I think **non-stockholders** donated more than **stockholders**
- ☐ I think **stockholders** donated more than **non-stockholders**
- ☐ I think **non-stockholders** and **stockholders** donated the same amount

Next



Figure I.44: Information experiment instructions

You have indicated that you think **non-stockholders** donated more than **stockholders**. How many percent do you think did **non-stockholders** donated more compared to **stockholders**?

For example, if you type 100, you think **non-stockholders** donated 100% more than **stockholders**, i.e., twice as much. A number of 30 means you think **non-stockholders** donated 30% more and so on.

%

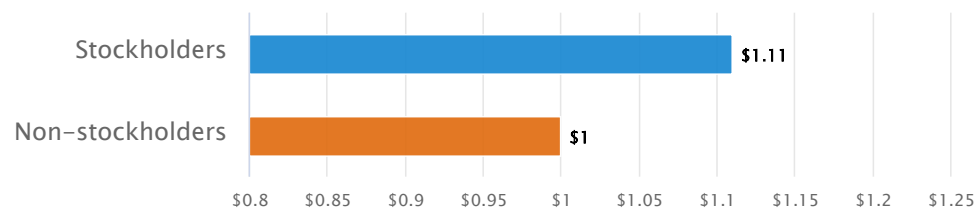
Next

Figure I.45: Information experiment instructions

We will now inform you about the **actual** difference between **stockholders** and **non-stockholders**. For the randomly selected participants, we found that ...

... **stockholders donate 11% more than non-stockholders.**

That is, for every \$1 that **non-stockholders** donate, **stockholders** donate on average \$1.11 for a good cause.



Next

Figure I.46: Information experiment instructions

Please repeat the information you just received on the previous page:

Which group donated more on average?

- ☐ Non-stockholders donated more
- ☐ Stockholders donated more
- ☐ Non-stockholders and stockholders donated the same amount
- ☐ I don't recall

Next

Figure I.47: Information experiment instructions

Questions

Please consider that the adult U.S. population is divided into two groups of people:

First, individuals who **do** possess any risky financial investments (e.g., stocks or funds [\[click for details!\]](#)).

Second, individuals who **do not** possess any risky financial investments.

We would like to know what you personally think about the individuals in those two groups. Please indicate to what extent you agree or disagree with each statement below. The statements concern the following three characteristics:

**Greedy:** a strong wish to continuously get more of things like wealth, possessions or social values.

**Being a gambler:** a person that shows the tendency to risk money or other stakes in the hope of being successful.

**Selfish:** being willing to accept negative consequences for other people or the environment to gain a personal advantage as a result.

Individuals who **do** possess any risky financial investments such as stocks are, on average, ...

... kind of greedy.

Totally disagree

☐

0

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

10

Totally agree

... kind of gamblers.

Totally disagree

☐

0

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

10

Totally agree

... kind of selfish.

Totally disagree

☐

0

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

10

Totally agree

Individuals who **do not** possess any risky financial investments such as stocks are, on average, ...

... kind of greedy.

Totally disagree

☐

0

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

10

Totally agree

... kind of gamblers.

Totally disagree

☐

0

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

10

Totally agree

... kind of selfish.

Totally disagree

☐

0

☐

1

☐

2

☐

3

☐

4

☐

5

☐

6

☐

7

☐

8

☐

9

☐

10

Totally agree

Next

## I.5 Follow-up survey instructions

Figure I.48: Follow-up survey instructions

### Opinion Survey 2022

Thank you for your interest in this survey, which is part of a study conducted by researchers from the IZA - Institute of Labor Economics. By dedicating 5 minutes of your time to complete this survey, you help us gain valuable insights about choices and opinions of people living in the United States.

Your data will be stored and analyzed in full compliance with the General Data Protection Regulation. In particular, your responses are confidential and no conclusions about your person will be drawn. You can withdraw your consent at any time.

You can read the full privacy policy by clicking [here](#).

Please consent to the processing of your data and your participation in this study.

- ☐ I consent
- ☐ I do not consent



Figure I.49: Follow-up survey instructions

How much do you agree or disagree with the statements below?

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
In the next five years, I will under <b>no</b> circumstances or situations whatsoever <b>donate more money to a good cause</b> than I currently do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the next five years, I will under <b>no</b> circumstances or situations whatsoever <b>invest any of my own money into financial assets</b> traded on the stock market such as funds or shares.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the next five years, I will under <b>no</b> circumstances or situations whatsoever <b>do more sports</b> than I currently do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the next five years, I will under <b>no</b> circumstances or situations whatsoever <b>make more environmentally friendly decisions.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In the next five years, I will under <b>no</b> circumstances or situations whatsoever <b>buy disability insurance or increase coverage.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Figure I.50: Follow-up survey instructions

Please think about the personality traits of the following two groups: Those who **regularly make donations** for a good cause (labeled "Regular donors" below) and those who **do not regularly make donations** for a good cause (labeled "No regular donors" below).

For each character trait, please indicate what you think about people belonging to the two groups on the following scale from 1 to 9.

For example, if you think people who regularly make donations are much more intelligent, select 1 using the slider. If you think people who do not regularly make donations are much more intelligent, select 9. If you see no difference between the two groups, select 5 by clicking on the respective position.





Regular donors	1	2	3	4	No difference	5	6	7	No regular donors	8	9
Intelligent											
Selfish											
Generous											
Close-minded											



Figure I.51: Follow-up survey instructions

Please think about the personality traits of the following two groups: Those who **invest any money into financial assets traded on the stock market such as funds or shares** (labeled "Stockholder" below) and those **without financial assets traded on the stock market** (labeled "Non-stockholder" below).

For each character trait, please indicate what you think about people belonging to the two groups on the following scale from 1 to 9.

For example, if you think stockholder are much more intelligent, select 1 using the slider. If you think non-stockholder are much more intelligent, selected 9. If you see no difference between the two groups, select 5 by clicking on the respective position.





Stockholder	1	2	3	4	No difference	5	6	7	Non-Stockholder	8	9
Intelligent											
Selfish											
Generous											
Close-minded											





Figure I.52: Follow-up survey instructions

Please think about the personality traits of the following two groups: Those who **have a disability insurance** (labeled "Insured" below) and those who **do not have a disability insurance** (labeled "Non-insured" below).

For each character trait, please indicate what you think about people belonging to the two groups on the following scale from 1 to 9.

For example, if you think insured people are much more intelligent, select 1 using the slider. If you think non-insured people are much more intelligent, select 9. If you see no difference between the two groups, select 5 by clicking on the respective position.





Insured	2	3	4	No difference	6	7	8	Non-insured
1				5				9
<b>Intelligent</b>								
								
<b>Selfish</b>								
								
<b>Generous</b>								
								
<b>Close-minded</b>								
								



Figure I.53: Follow-up survey instructions

How many surveys with a similar topic like this one have you completed in the last two weeks?

- ☐ None
- ☐ One
- ☐ Two to five
- ☐ Five to ten
- ☐ More than ten

If you had to guess, what would you say was the purpose of this study?

→

Figure I.54: Follow-up survey instructions

**Thank you!**

Thank you very much for completing the survey. You will be redirected to Prolific on the next page.

