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Misperceived Returns to Active Investing

Abstract

We conduct field experiments with retail investors recruited from a social trading platform. In our main experiment, we first elicit beliefs about the returns to active investing. We then generate exogenous variation in beliefs by providing treated respondents with information about index funds historically outperforming active funds. Treated respondents are 17.8 percentage points more likely to believe that index funds will outperform active funds in the future. Four months after the experiment, we collect administrative data on portfolio allocations. Treated respondents increase the index fund shares of their portfolios by 4.4 percentage points (37.7%) relative to the control group.

JEL-Codes: G500, D910, D830.

Keywords: household finance, retail investors, portfolio allocations, field experiment.

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1 Introduction

According to standard finance theory, people should adopt a passive investment strategy and place all their risky assets in the market portfolio (Merton, 1969; Tobin, 1958). In practice, many retail investors instead employ inferior active investment strategies. For instance, they often fail to diversify their portfolios (French and Poterba, 1991) and pay too much in fees from excessive trading in individual stocks (Barber and Odean, 2000). Furthermore, despite abundant evidence that index funds outperform active funds after fees (Fama and French, 2010), most retail investors prefer actively managed funds over low-cost index funds (Beshears et al., 2018). The preference for active investment strategies is a costly mistake: French (2008) estimates that a typical active investor could increase his annual return by 67 basis points by adopting a passive investment strategy.[1]

Why do many retail investors employ active investment strategies, such as holding individual stocks and actively managed funds, when passive investing is more profitable after fees? One hypothesis is that this active investment puzzle is driven by misperceptions about the returns to active investing (French, 2008). These misperceptions could plausibly arise because banks often promote active investment strategies (Hackethal et al., 2012; Inderst and Ottaviani, 2012; Mullainathan et al., 2012) or because active strategies are more likely to be transmitted in social networks (Han et al., 2022). However, the preference for active investment strategies could also be driven by behavioral biases or non-standard preferences, such as overconfidence (Barber and Odean, 2000; Daniel et al., 1998), gambling preferences (Kumar, 2009), a desire for the bragging rights associated with obtaining superior returns (Statman, 2004), or perceiving active investing as a joyful social activity (Shiller et al., 1984).

If misperceptions are part of the reason why investors tend to employ active trading strategies, there could potentially be large welfare gains from educational interventions that correct misperceptions about the returns to active investing. On the other hand, if choices instead mainly reflect behavioral biases or non-standard preferences, it might be more difficult to increase the take-up of passive investing strategies with educational interventions. To examine whether misperceptions can explain why retail

[1] Since active and passive investing strategies have the same returns before fees, and active investing strategies have higher fees, it must be the case that the returns to active investing are lower than the returns to passive investing after fees (Sharpe, 1991).

investors tend to employ active investment strategies, we conduct field experiments with retail investors recruited from a social trading platform in Norway. In our main experiment, 588 retail investors participate in a survey in which we elicit beliefs about historical return differences between active funds and index funds. Respondents randomly assigned to a treatment group are then informed about the main results from a report by the Norwegian Consumer Council which found that index funds gave 1.1 percentage points higher annual returns than comparable actively managed funds. We then measure post-treatment beliefs about whether index funds will outperform active funds in the future as well as beliefs about one's own ability to produce superior returns with active investment strategies. Finally, around four months after the experiment, we merge the survey responses with administrative data on actual portfolio allocations to examine long-term treatment effects on the portfolio share invested in index funds.

Our first result is that information about index funds historically outperforming active funds strongly affects beliefs about whether index funds will outperform active funds in the future. Specifically, treated respondents are 17.8 percentage points more likely to think that index funds will outperform active funds in the future ($p < 0.001$), corresponding to a 38.8% increase compared to the control group mean of 45.9%. Treated respondents are also 5.5 percentage points less likely than control group respondents to think that they can outperform the market by picking individual stocks ($p = 0.003$) and are 6.4 percentage points less likely to think that they can identify superior active funds ($p < 0.001$).

Our second result, and the main result of the paper, is that the information also has a persistent and economically significant impact on actual investment behavior. Specifically, four months after the experiment, treated respondents have a 4.4 percentage points higher index fund share than control group respondents ($p = 0.011$), corresponding to a 37.7% increase compared to the control group mean of 11.7%. The higher portfolio share invested in index funds is driven by a lower portfolio share of individual stocks rather than by substitution away from actively managed funds. The shift away from individual stocks is consistent with the respondents becoming significantly more pessimistic about their own ability to obtain superior returns from active stock picking.

While retail investors often obtain inferior returns by paying too much in active trading fees (Barber and Odean, 2000), they are also more likely to buy individual stocks that are unpopular among institutional investors. For instance, "meme stocks," such as GameStop, have recently become popular among many retail investors despite

repeated warnings from experts about bubbles and the potential for heavy losses (Pedersen, 2022).[2] To examine whether misperceptions could drive retail investors toward potentially overvalued individual stocks, we exploit a unique case that occurred in early 2021 when stock market professionals and financial journalists warned retail investors against buying shares in Norwegian Air Shuttle (NAS), the second most popular stock on the Oslo Stock Exchange (OSE). For instance, the biggest business newspaper in Norway wrote that there "should be a law against buying NAS at today's prices."[3]

In our second field experiment, we recruit 130 retail investors who own shares in NAS, and we expose treated respondents to a short video with a well-known portfolio manager who had repeatedly warned retail investors against buying NAS shares in the media. In the one-minute video, the portfolio manager explains how an upcoming deeply discounted equity raising will likely make the share price fall drastically within a few months. This information was widely circulated in the media and should thus mainly affect retail investors who pay limited attention to financial news—in other words, retail investors who might be particularly likely to make active trading mistakes. After the experiment, we match survey responses with administrative data on whether respondents have actually sold the stock. One day after receiving information from the portfolio manager about why he thinks the NAS stock is overvalued, treated respondents are 20.6 percentage points more likely than control group respondents to have sold the stock ($p < 0.001$). This effect persists three months after the experiment. In line with the hypothesis that these misperceptions arise partly due to limited attention to financial news, a complementary survey experiment shows that investors who frequently read financial news have significantly more pessimistic beliefs about the future NAS share price.

Overall, the findings from our experiments demonstrate that correcting misperceptions among retail investors about the returns to active investing can have a persistent and economically significant impact on actual investment behavior. These findings have important implications for policy makers who may want to employ low-cost information interventions to help retail investors avoid costly investment mistakes. The findings also demonstrate high correlations between survey intentions and actual financial behavior, suggesting that survey experiments in finance can be very valuable even in cases where

[2] "What's the $23 Billion GameStop Really Worth? Maybe $2 Billion," Olga Kharif. *Bloomberg*, January 27, 2021.

[3] "Det burde være en lov som forbød å kjøpe Norwegian på dagens kurser," Thor Jensen. *Dagens Næringsliv*, January 15, 2021.

it is not possible to link the survey data with administrative data.

Our findings contribute to several strands of the literature. First, we contribute to the finance literature on why retail investors tend to invest in actively managed funds (Bucher-Koenen et al., 2021; Choi and Robertson, 2020; French, 2008; Glode, 2011; Guercio and Reuter, 2014; Savov, 2014). Several studies show that biased advice can contribute to misperceptions about the returns to active investing. Mullainathan et al. (2012) find that financial advisers push clients toward actively managed funds even if they start with a low-cost, well-diversified portfolio. Guercio and Reuter (2014) show that actively managed funds only significantly underperform index funds when they are sold through brokers, suggesting that agency problems might lead retail investors to inferior actively managed funds with weak incentives to deliver superior returns. In line with the finding in this literature that banks might push clients towards actively managed funds, we find that respondents who rely on bank advice when choosing an equity fund are 17.8 percentage points more likely to believe that active funds have historically outperformed index funds ($p < 0.001$).

A related set of studies use surveys to understand people's motivations to invest actively. Choi and Robertson (2020) ask retail investors to list their motivations for investing in active funds. They find that 51% of active fund investors believe that active funds will lead to higher returns, and 48% say that their financial advisers recommended active funds. In addition, in line with some studies claiming that active funds perform relatively better during recessions (Kosowski, 2011; Moskowitz, 2000), they find that 27% of the respondents list better performance during recessions as an important factor for choosing active funds. Bender et al. (2022) find broadly similar motivations for investing in active funds in a related survey of very wealthy investors. Our main contribution to this literature is to provide the first experimental evidence on why retail investors tend to invest in actively managed funds with a focus on the role of misperceptions about the returns to active investing strategies.

Second, we contribute to the literature on beliefs and portfolio choices (Ameriks et al., 2020; Amromin and Sharpe, 2014; Andersen et al., 2020; Armantier et al., 2015; Chinco et al., 2022; Dominitz and Manski, 2007; Giglio et al., 2021a,b; Kézdi and Willis, 2011; Liu et al., 2022; Malmendier and Nagel, 2011; Meeuwis et al., 2022; Merkle and Weber, 2014). Giglio et al. (2021a) find that survey expectations about future stock market returns correlate with the portfolio share invested in the stock market, although the relationship is weaker than predicted by standard models. We

contribute to this literature by providing new evidence on the relationship between survey beliefs and portfolio choices. While most of the previous studies in this literature examine how beliefs correlate with the portfolio share invested in the stock market, we provide evidence on how beliefs about the returns to active investing correlate with the share of assets invested in index funds. We also provide the first experimental evidence on how providing information about index funds outperforming active funds affects the portfolio share invested in index funds.

Third, we contribute to a growing literature on information provision experiments in macroeconomics and household finance (Andre et al., 2022; Armantier et al., 2016; Armona et al., 2019; Beshears et al., 2015; Beutel and Weber, 2021; Binder and Rodrigue, 2018; Bottan and Perez-Truglia, 2020; Bursztyn et al., 2014, 2019; Cavallo et al., 2017; Coibion et al., 2019, 2021; Dolls et al., 2018; Fuster et al., 2020; Hanspal et al., 2020; Laudenbach et al., 2022; Qian, 2019; Roth and Wohlfart, 2020; Roth et al., 2022).[4] Laudenbach et al. (2022) examine how beliefs about the autocorrelation of aggregate stock returns drive disagreement and trade in asset markets. To the best of our knowledge, Laudenbach et al. (2022) is the only prior paper that combines an information provision treatment with administrative data on investment behavior. Our two papers complement each other by demonstrating, across very different settings, that low-cost information interventions can have long-lasting impacts on actual investment behavior.

Fourth, we contribute to the literature on financial literacy interventions (Bhattacharya et al., 2012; Brown et al., 2016; Drexler et al., 2014; Fernandes et al., 2014; Huston, 2010; Kaiser et al., 2022; Lusardi and Mitchell, 2014). Choi et al. (2010) find that few participants choose the fee-minimizing index fund in a laboratory experiment, suggesting that low financial literacy may be associated with the demand for expensive funds. Grinblatt et al. (2016) find that high-IQ investors avoid funds with high management fees. Ben-David et al. (2022) find that mutual fund investors have limited financial sophistication. We contribute to this literature by showing that short information treatments have the scope to reduce misperceptions and persistently change actual investment behavior. We also present evidence on how financial literacy moderates the impact of new information correcting misperceptions about the returns to active investing.

[4]For a review of the literature on information provision experiments in economics and finance, see Haaland et al. (2021).

Finally, our study relates to an emerging literature using online social trading platforms, such as Robinhood and Stocktwits, to study financial behavior (Barber et al., 2022; Cookson et al., 2022; Eaton et al., 2022; Heimer, 2016; Heimer and Imas, 2021; Pagano et al., 2021; Welch, 2022).

The rest of the paper proceeds as follows. Section 2 presents the setting, sample, and experimental design of our main experiment on active fund investments. Section 3 provides correlational and causal evidence on the relationship between survey beliefs and actual portfolio allocations. Section 4 shows additional results from a survey experiment with a large and heterogeneous sample of the Norwegian population. Section 5 presents the design and results from a second field experiment on the selling of individual stocks. Section 6 concludes.

2 Experiment 1: Actively managed funds

2.1 Setting

We examine the choices of retail investors on Shareville, the largest social trading platform in the Nordics. As of January 2023, Shareville had 305,000 members with a total of NOK 113 billion (approximately USD 11.3 billion) invested on the platform. The platform is a subsidiary of Nordnet, the largest online broker in the Nordic countries. To create a profile on Shareville, one needs to be a Nordnet customer with an active investment account and a secure electronic ID. The investment account is subsequently linked to the Shareville account, making the portfolio and all trading activity linked to the account visible to other users. In addition to observing the investment portfolios and trading activities of other users, one can join discussion forums and follow other users to get immediate notifications about their trading activities. According to Nordnet, users on Shareville have higher returns and more diversified portfolios than other Nordnet investors. Most users on Shareville also use a pseudonym to preserve their anonymity.

Figure 1 shows a screenshot of a Shareville account. The portfolio is displayed to other users as a pie chart. One can observe the exact portfolio share of each asset (but not the portfolio's total value). It is also possible to observe trading activities on the platform. For instance, if someone buys "Nordnet Indeksfond Norge" on Shareville or through a Nordnet account linked with their Shareville account, their Shareville profile

will be automatically updated with a new post with details about the trade, including the fund's price and the transaction date (as shown in Figure A.8). The trading activities are usually publicly visible to everyone on the Internet, while the information about the portfolio share of each asset requires one to log into their Shareville account using an electronic ID for secure identification.

2.2 Sample

On June 1, 2021, we invited 16,120 Shareville users to participate in our survey. The invitations were sent out through the private message function on Shareville using an automated script. We invited all Shareville users based in Norway with at least one equity fund in their portfolio to participate in a short three-minute survey. Users who completed the survey entered a lottery with ten gift cards of NOK 500 (approximately USD 50). To take the survey, they could visit the web page `www.investorsurvey.no` that redirected them to our Qualtrics survey. From June 1 to 7, 588 Shareville users participated in our survey, giving us an overall response rate of 3.7%.

2.3 Experimental design

The study has two main components: a survey experiment with randomized information provision and a follow-up study in which we merge survey responses with administrative data on portfolio allocations. Section D of the Online Appendix provides English translations of the instructions, and Section H provides screenshots of the original experimental instructions in Norwegian. Figure A.1 provides an overview of the experiment.

Introduction to the survey experiment We first provide respondents with basic information about the survey and repeat the information that 10 randomly drawn participants will receive a 500 NOK gift card for completing the study. Before the survey starts, we ask the respondents to provide their Shareville usernames as we needed the Shareville usernames to re-contact gift card winners. Collecting usernames also allows us to match survey responses with administrative data on actual portfolio allocations.

Pre-treatment beliefs When eliciting pre-treatment beliefs, we first briefly explain to the respondents the difference between active funds and index funds. We then elicit pre-treatment beliefs about the performance of global active versus global passive funds offered by Norwegian banks over the last 20 years (after fees). We focus on global funds as they are the most popular fund type and also offer the best diversification benefits. In the first question, we ask respondents whether they think active funds have given higher or lower returns than index funds. We use the following three answer categories to keep the survey short and simple: (1) "active funds have given the highest returns," (2) "active funds and index funds have given about equal returns," and (3) "Index funds have given the highest returns." We next elicit beliefs about how active funds that outperformed the market in the first half of the decade performed in the second half of the decade with the following three answer categories: (1) "they also gave higher returns than average in the second half of the decade," (2) "they gave average returns the second half of the decade," and (3) "they gave below-average returns the second half of the decade."

Information treatment To introduce exogenous variation in beliefs about the returns to actively managed funds, we next randomize respondents into a treatment and a control group. Respondents in the treatment group are informed about a recent report from the Norwegian Consumer Council which examined the performance of all active and passive funds offered by Norwegian banks over the last 20 years and found that index funds outperformed active funds by a 1.1 percentage points higher yearly return. We also provide an example used in the report from the Consumer Council regarding how much money one could expect to lose from choosing active funds over a 20-year investment horizon. Specifically, respondents in the treatment group receive the following text:

> The Norwegian Consumer Council published a survey last year in which they compared the returns on global active funds and index funds offered by Norwegian banks over the last 20 years.
>
> They found that **active funds on average gave a 1.1 percentage points lower yearly return than index funds**. According to the Consumer Council, you can expect to lose NOK 370,000 over 20 years if you choose to invest NOK 500,000 in an active fund instead of an index fund.

> The Consumer Council also found that it is not possible to predict the returns of a fund over time: **Active funds with a good performance in the first half of the period did neither better nor worse than other funds in the second half of the period.**

Respondents in the control group do not receive any additional information and proceed directly to the post-treatment outcomes.

Post-treatment survey outcomes To measure whether the respondents found the historical return data informative about future returns, we first elicit post-treatment beliefs about the future performance of active versus passive funds with the following three answer categories: (1) "active funds will give higher returns than index funds," (2) "active funds and index funds will give about equal returns," and (3) "index funds will give higher returns than active funds." Furthermore, to examine whether the lack of correlation of returns over time affects how confident respondents are in finding a superior active fund, we ask the following question: "what is the probability that over time you will find active funds that will give better returns than comparable index funds (after fees)?"

To examine whether the treatment also affects confidence in their own ability to beat the market, we ask respondents the following question: "what is the probability that over time you will be able to beat the market by investing in individual stocks?" Respondents answer both questions by moving a slider between 0% and 100%. To make the scale intuitive to respondents, we include qualitative descriptions above the slider where, for example, 10% corresponds to "very improbable" and 90% corresponds to "very probable." Finally, we ask how the respondents plan to structure their equity portfolio between active funds, index funds, and individual stocks going forward. They answer this question by assigning percentages to each category (which must total 100%).

Post-treatment outcomes on portfolio choices Around four months after the experiment, we collect portfolio data from the Shareville accounts. Since it is not possible to scrape data on portfolio shares from Shareville, we manually collect the data by visiting each user's portfolio page.[5] Of the 588 participants who completed the survey

[5] As manually collecting the administrative data is very time-consuming, the data was collected only once. To avoid bias, the data was collected without knowledge of the respondents' treatment status.

with a valid username, 584 still had their equity portfolio visible four months after the experiment, giving us an attrition rate of just 0.7% for the administrative data (the four respondents who had made their profile non-public were equally balanced across the treatment and the control group). The portfolio data consists of active funds, passive funds, and individual stocks (a few users also had a low percentage of cash holdings in their portfolios). We observe the value of each asset as a percentage of the portfolio total but not the total value of the portfolio.

For each account, we calculate the fraction of total assets invested in active funds and index funds in the portfolio. To identify index funds, we use Nordnet's list of index funds.[6] 60.4% of our respondents have multiple trading portfolios linked with their Shareville profile (e.g., for tax purposes). For these respondents, we calculate their average passive and active share across trading accounts. Calculating a simple average instead of a value-weighted average introduces some noise in the data but no systematic bias across the treatment and the control group.

3 Experiment 1: Results

3.1 Selection into the survey and treatment arm balance

Selection into the survey Of the 16,120 Shareville users invited to the survey, 588 people with a valid username were assigned into treatments, leading to a response rate of 3.6%. A natural concern about our sample is that our users might not be representative of the average retail investor on the platform. For instance, respondents more active on the platform might be more likely to read our invitation and thus participate in the survey. To shed light on how selected our sample is, we use data collected on all invited users a few weeks before the survey, including their portfolio returns during the last six months, their number of trades during the last month, and the number of passive funds in their portfolio.[7] As shown in Table A.1 of the Online Appendix, our sample is not completely representative of these dimensions. In particular, our respondents have

[6]This list of index funds offered by Nordnet is available at the following link: `https://www.nordnet.no/market/funds?sortField=yield_1y&sortOrder=descending&fundType=INDEX` (accessed November 11, 2021).

[7]While it is possible to scrape data on past returns, trading volume, and the number of passive funds for all Shareville users, we must hand-collect the data on index fund shares by visiting each profile individually. It was thus not feasible to collect pre-treatment data on index fund shares.

higher six-month returns (18.2% versus 13.2%; $p < 0.001$), a higher trading volume (8 versus 3.5 trades; $p < 0.001$), and somewhat higher number of passive funds in their portfolios, on average (2.0 versus 1.8; $p = 0.020$).

Integrity of the randomization We also use our pre-treatment data to provide balance tests between treatment and control group respondents. As shown in Table A.2, there are no notable differences between treatment and control group respondents on observable characteristics. For instance, they have virtually identical pre-treatment beliefs about whether active funds have given higher returns than index funds, and they have similar returns, number of trades, and number of passive funds in their portfolios.

3.2 Descriptive evidence on beliefs and portfolio choices

As shown in Figure A.3, there is a wide dispersion in people's beliefs about whether active funds or index funds will provide the highest returns after fees in the future. Among control group respondents, 45.9% believe that index funds will outperform active funds, 28.4% believe that active funds will outperform index funds, and the remaining 25.7% believe that active funds and index funds will provide similar returns. To examine whether this heterogeneity in beliefs predicts actual portfolio choices, we use data from control group respondents. As shown in Figure 2, we find that the survey beliefs about whether index funds will outperform active funds in the future are strongly correlated with actual investments in index funds: Respondents who believe that index funds will outperform index funds have 15.0% of their portfolio invested in index funds compared to 7.1% for respondents who believe that active funds will outperform index funds—a highly significant 7.9 percentage points difference ($p = 0.001$).

While 45.9% of the control group respondents believe that index funds will outperform active funds, some of these investors might still prefer to invest in active funds if they believe that they can identify the best active funds with superior returns. As shown in Panel (a) of Figure 2, we indeed see a strong negative correlation between investments in index funds and confidence in one's own ability to identify superior active funds ($p = 0.003$). Furthermore, as shown in Panel (b) of Figure 2, we also see a strong negative correlation between investments in index funds and beliefs about one's own ability to outperform the market with stock picking ($p < 0.001$). For instance, the predicted index fund share for a respondent who is 100% confident that he can

outperform the market with stock picking is 0.4% compared to 20.9% for a respondent who is 100% sure that she cannot outperform the market. These results demonstrate that survey beliefs are very informative about actual portfolio allocation decisions. Our first main result can be summarized as follows.

Result 1. Survey beliefs are strongly correlated with actual investments in index funds. Believing that index funds will outperform active funds after fees is negatively correlated with investments in index funds. Furthermore, higher confidence in one's own ability to identify superior active funds or to outperform the market with stock picking is negatively correlated with portfolio shares in index funds.

3.3 Do people update their beliefs about fund returns?

Main effects We first examine how the information treatment affects belief updating, and the results are shown in columns 1–4 of Table 1, Panel A. As shown in column 1, treated respondents are 15.3 percentage points less likely to think that active funds will outperform index funds in the future ($p < 0.001$), corresponding to a 53.9% decrease compared to the control group mean of 28.4%. Similarly, column 2 shows that treated respondents are 17.8 percentage points more likely to think that index funds will outperform active funds in the future ($p < 0.001$), corresponding to a 38.8% increase compared to the control group mean of 45.9%.

Treated respondents are also more pessimistic about their own ability to identify active funds that will outperform similar index funds and are more pessimistic about their own ability to beat the market by investing in individual stocks. Specifically, as shown in column 3, treated respondents are 6.4 percentage points less likely to think that they can identify active funds outperforming index funds ($p < 0.001$), corresponding to a 13.9% decrease compared to the control group mean of 45.8%. Furthermore, as shown in column 4, treated respondents are 5.5 percentage points less likely to think that they can beat the market by picking individual stocks ($p = 0.003$), corresponding to a 12.4% decrease compared to the control group mean of 44.4%.

Heterogeneous effects by pre-treatment beliefs Columns 1–4 of Table 1, Panel B shows treatment heterogeneity based on prior beliefs about whether index funds had outperformed index funds. We generally see the largest belief updating among

respondents who thought that active funds had historically outperformed index funds—consistent with this group having more scope to change their beliefs about the returns to passive investing. Specifically, as shown in column 1, treated respondents who thought that active funds had historically outperformed index funds update their beliefs the most and are 46.1 percentage points less likely to think that active funds will outperform index funds in the future ($p < 0.001$). Treated respondents who thought that active funds and index funds had provided similar past returns are 18.7 percentage points less likely to think that active funds will outperform index funds in the future ($p = 0.003$). Finally, treated respondents who thought that index funds had historically outperformed active funds are 4 percentage points less likely to think that active funds will outperform index funds in the future, though this effect is not statistically significant ($p = 0.252$).

As shown in column 2, treated respondents who thought that active funds had historically outperformed index funds are 28.9 percentage points more likely to think that index funds will outperform active funds in the future ($p < 0.001$). Respondents who thought that active funds and index funds had provided similar past returns are 21.2 percentage points more likely to think that index funds will outperform active funds in the future ($p = 0.008$). Finally, respondents who thought that index funds had historically outperformed active funds are 12.8 percentage points more likely to think that index funds will outperform active funds in the future ($p = 0.008$).

As shown in columns 3 and 4, we also see suggestive evidence of larger treatment effects among respondents who thought that active funds had historically outperformed index funds, but this heterogeneity is not statistically significant. For instance, respondents who thought that active funds had historically outperformed index funds are 10.5 percentage points less likely to think they can identify a superior active fund ($p = 0.002$), while respondents who thought that index funds had historically outperformed active funds are only 4.5 percentage points less likely to think this ($p = 0.028$). For beliefs about one's own ability to beat the market by picking individual stocks, we see quite similar point estimates across groups.

Given all of the findings discussed above, our second main result is as follows.

Result 2. Retail investors are 17.8 percentage points more likely to believe that index funds will outperform active funds in the future after being presented with historical data showing that index funds have outperformed active funds in the past. This information also makes them more pessimistic about their own ability to identify superior active

funds and about their own ability to beat the market by investing in individual stocks.

3.4 Treatment effects on portfolio choices

Having established a significant first stage on beliefs about the returns to passive investing, we next examine whether the correlations uncovered in Section 3.2 reflect a causal relationship between beliefs and investment behavior.

3.4.1 Portfolio allocation intentions

We first examine treatment effects on portfolio allocation intentions, that is, the percentage of their equity portfolio that respondents plan to invest in index funds. As shown in column 5 in of Table 1, Panel A, treated respondents plan to increase the index share of their equity portfolio by 7.8 percentage points ($p < 0.001$), corresponding to a 24.1% increase compared to the control group mean of 32.4%. Interestingly, the treatment effect on portfolio intentions is primarily driven by respondents planning a lower portfolio share of individual stocks rather than by a shift from active to passive funds: treated respondents plan to significantly decrease their portfolio shares of individual stocks by 6.2 percentage points ($p < 0.001$) compared to a non-significant decrease of 1.6 percentage points ($p = 0.275$) in the planned active fund share of the portfolio. A lower planned share of individual stocks among treated respondents is consistent with treated respondents becoming more pessimistic about their own ability to beat the market by picking individual stocks.

Turning to heterogeneity in treatment effects (column 5 of Panel B), we observe no significant treatment heterogeneity by prior beliefs about whether index funds had historically outperformed active funds. The lack of heterogeneous effects on index share intentions is consistent with a statistically significant first stage on beliefs about the benefits of passive investing among all groups.

3.4.2 Actual portfolio choices

A natural concern about the self-reported data is that the respondents might not follow through with their stated intent of increasing the index fund share of their portfolio. To address this concern, we collect data on actual portfolio shares around four months after

the experiment. As shown in column 6 of Table 1, we find that respondents actually follow through on their intentions: treated respondents have a 4.4 percentage points higher index portfolio share than control group respondents four months after the experiment ($p = 0.011$). This effect size corresponds to a 37.7% increase compared to the control group mean of 11.7%.[8] Consistent with the intentions expressed in the survey, the higher index fund share is driven by a lower portfolio share of individual stocks rather than by substitution away from actively managed funds: treated respondents have a 6.2 percentage points lower portfolio share of individual stocks ($p = 0.006$) and a non-significant 1.6 percentage points higher active fund portfolio share ($p = 0.275$) than control group respondents four months after the experiment.

Panel B of Table 1 shows heterogeneous effects by prior beliefs. The point estimates are consistent with the largest shift in the index portfolio shares among treated respondents who initially thought that active funds had outperformed index funds. These respondents significantly increase the index share of their portfolio by 10 percentage points ($p = 0.009$) compared to non-significant increases of 2.9 percentage points ($p = 0.43$) and 3.2 percentage points ($p = 0.148$) among respondents who thought that index funds had provided similar and superior returns compared to active funds, respectively. These results underscore the importance of collecting administrative data in addition to self-reported survey data: while there was no heterogeneity by pre-treatment beliefs in plans to increase the index portfolio share by pre-treatment beliefs, we see suggestive evidence of a larger shift toward index funds among respondents who initially thought that active funds had historically outperformed index funds. Our third main result is as follows.

Result 3. A shift in beliefs about the returns to passive investing leads to an economically and statistically significant change in portfolio allocations. Four months after the experiment, treated respondents have a 4.4 percentage points higher index portfolio share than control group respondents ($p = 0.011$), corresponding to a 37.7% increase compared to the control group mean of 11.7%.

[8]Notably, the actual control group index share mean of 11.7% is considerably lower than the intended control group share mean of 32.4%. Part of this effect could be driven by the respondents misclassifying some active funds in their portfolio as passive funds.

4 Experiment 2: Mechanisms and heterogeneity

One natural concern about our field experiment is that investors who are active on the platform and choose to participate in our survey might not be representative of the broader population of retail investors. To assess the external validity of the main results, we therefore conducted a survey experiment with a more representative sample of the Norwegian population.

4.1 Sample and experimental design

In July 2022, we recruited a sample of 1,005 respondents in collaboration with YouGov. The survey was restricted to respondents holding stocks or equity funds. Although the sample was not constructed to be representative of the general population, the sample is nonetheless broadly representative of the Norwegian population on gender (51.9% male compared to 50.2% in the general population), age (47.4% over 50 years of age compared to 48.3% in the general population), and geography (19.4% living in rural areas compared to 17.6% in the general population). A notable difference compared to the general population, as is common with most online panels, is that respondents in our sample are more likely to have a college education (66.8% versus 34.6%).

Experiment 2 largely follows the format of our original survey with the Shareville investors. We ask the same pre-treatment questions about whether they think active funds have given higher or lower returns than index funds over the last 20 years (after fees) and whether they think active funds that outperformed the market in the first half of the decade also outperformed the market in the second half of the decade (as discussed in Section 2.3). We next administer our main treatment which informs respondents in the treatment group that index funds have outperformed active funds by 1.1 percentage points per year after fees. Following the information treatment, we ask all respondents a series of post-treatment beliefs about future returns of active versus passive funds and one's own ability to beat the market. Finally, as in the original Shareville survey, we ask how the respondents plan to structure their equity portfolios between active funds, index funds, and individual stocks going forward. While we cannot observe actual portfolio choices for the representative sample, the results in Section 3.4.2 demonstrate a high correlation between portfolio intentions and actual portfolio shares four months later.

In addition to including all the main questions from the original survey, we also

include a battery of demographic questions and some further questions to examine potential mechanisms behind the treatment effects. Specifically, before we ask the pre-treatment belief questions about historical fund returns, we elicit basic demographics (including gender, age, education, income, and region). We next ask two questions about financial literacy. Following the classification in van Rooij et al. (2011), we include one "basic" question about interest compounding and one "advanced" question about stock ownership.

We also ask a question about overconfidence in which respondents indicate what percentage of the stock market population they think are better than them in identifying equity funds and stocks that will outperform the market (Glaser and Weber, 2007). Furthermore, at the very end of the survey, we ask a structured question about which sources the respondents rely on when choosing an equity fund. An English translation of these additional questions as well as complete screenshots of the original experiment in Norwegian are included in Section E and Section I of the Online Appendix, respectively.

4.2 Results

4.2.1 Descriptives and main treatment effects

As in the main experiment, there is a wide dispersion in people's beliefs about whether active funds or index funds will provide the highest returns after fees in the future. Among control group respondents, 25.2% believe that index funds will outperform active funds (compared to 45.9% in the main experiment). This finding suggests that respondents in our main experiment did not have unusually large misperceptions about the returns to active investing—in fact, respondents from the representative sample are almost twice as likely to believe that active funds will outperform index funds.

To shed some light on the potential origins of these misconceptions, Figure A.4 of the Online Appendix shows correlations between pre-treatment beliefs and the informational sources people rely on when choosing an equity fund. Interestingly, among seven potential informational sources—bank advice, discussions with friends, financial news, fund reports, expert advice, historical returns, and social media—the only factor that is robustly correlated with pre-treatment beliefs about historical fund returns is relying on advice from the bank. In line with existing studies emphasizing how biased bank advice could push clients towards actively managed funds (Guercio

and Reuter, 2014; Mullainathan et al., 2012), respondents who rely on bank advice when choosing an equity fund are 17.8 percentage points more likely to believe that active funds have historically outperformed index funds ($p < 0.001$). Figure A.5 further shows that there are few systematic correlations between beliefs about historical fund returns and other background characteristics.

Turning to treatment effects, Table 2 shows that we replicate our result from the main experiment that treated respondents become more pessimistic about the returns to active investing. Specifically, as shown in column 1, treated respondents are 10.6 percentage points less likely to think that active funds will outperform index funds ($p < 0.001$), corresponding to a 34.5% decrease compared to the control group mean of 30.8%. Similarly, column 2 shows that treated respondents are 20.1 percentage points more likely to think that index funds will outperform active funds ($p < 0.001$), corresponding to a 79.7% increase compared to the control group mean of 25.2%.

While the respondents also become 1.8 percentage points less likely to think that they can identify superior active funds (column 3), this difference is not statistically significant ($p = 0.171$). They are also only 0.8 percentage points less likely to think that they can beat the market by picking individual stocks ($p = 0.577$; column 4). These findings contrast somewhat with our main experiment in which respondents became significantly less confident in their own ability on both dimensions.

Column 5 shows that the treatment also affects investing intentions among the representative sample: treated respondents plan to increase the index share of their equity portfolio by 7.0 percentage points ($p < 0.001$), corresponding to a 17.5% increase compared to the control group mean of 39.8%. The point estimate of a 7.0 percentage points increase is strikingly similar to the main experiment, in which treated respondents planned to increase their index share by 7.8 percentage points ($p < 0.001$). Interestingly, the higher planned index fund share among the representative sample is primarily driven by a 5.5 percentage points ($p = 0.003$) lower planned active fund share rather than by a reduction in the share of individual stocks—consistent with no treatment effects on confidence in their own ability to beat the market by picking individual stocks in Experiment 2.

4.2.2 Heterogeneity by pre-treatment beliefs

As shown in Panel B of Table 2, we see large and significant treatment heterogeneity based on people's pre-treatment beliefs about whether active funds had historically outperformed index funds. For instance, respondents who thought, pre-treatment, that active funds had historically outperformed index funds are 29.6 percentage points more likely to think that index funds will outperform active funds in the future ($p < 0.001$) compared to a 9.8 percentage points increase among respondents who initially thought that index funds had historically outperformed active funds ($p = 0.083$).

The significantly larger belief updating among respondents who initially thought that active funds had outperformed index funds carries over to portfolio allocation intentions (column 5 of Table 2). These respondents plan to increase the index share of their portfolio by a highly significant 13.1 percentage points ($p < 0.001$) compared to non-significant increases of 5 percentage points ($p = 0.124$) and 0.1 percentage points ($p = 0.971$) among respondents who thought that index funds had historically provided similar or superior returns compared to active funds, respectively. In sum, the strong heterogeneity by pre-treatment beliefs on stated intentions suggests that our results are driven by genuine changes in beliefs rather than by priming effects or experimenter demand effects (Haaland et al., 2021).

4.2.3 Heterogeneity by background characteristics

Our rich set of demographics and background questions allows us to examine further potential patterns of heterogeneity compared to the main experiment. In this section, we focus on financial literacy, confidence in one's own ability to outperform the market, and gender differences.[9]

Financial literacy The distinction between active and passive investing might be more difficult to understand for financially unsophisticated investors. In particular, respondents with low financial literacy might struggle to internalize new information and optimize their financial behavior accordingly. To examine whether standard measures of financial literacy interact with our treatment effects, we therefore analyze

[9]Figure A.6 of the Online Appendix shows heterogeneity on some further dimensions not discussed in the main text.

treatment effect heterogeneity by financial literacy. Specifically, we classify the 53% of respondents who answered both pre-treatment questions on financial literacy correctly as "high literacy" respondents and the remaining 47% of respondents who answered at least one of the questions incorrectly as "low literacy" respondents (English translations of the financial literacy questions are included in Section E).

Panel A of Table 3 shows that high literacy respondents generally respond stronger to the treatment. For instance, as shown in column 2, while treated low literacy respondents are 12.0 percentage points more likely to think that index funds will outperform active funds in the future ($p = 0.003$), treated high literacy respondents are 27.2 percentage points more likely to think this ($p < 0.001$). The 15.2 percentage points higher treatment effect among high literacy respondents is statistically significant ($p = 0.004$). Column 5 shows suggestive evidence that the higher belief updating among high literacy respondents partly carries over to portfolio allocation intentions: while low literacy respondents plan to increase the index fund share of their portfolio by 5.0 percentage points ($p = 0.074$), high literacy respondents plan to increase the share by 8.7 percentage points ($p = 0.001$). However, this 3.7 percentage points higher treatment effect among high literacy respondents is not statistically significant ($p = 0.327$).

Confidence in one's own ability There is extensive evidence that overconfidence affects trading behavior (Glaser and Weber, 2007; Odean, 1998). For instance, overconfident investors might react less strongly to the information about index funds outperforming active funds if they feel very confident that they can identify the best investment opportunities themselves. To measure confidence in one's own ability, we asked the respondents what percentage of the population they thought were better than them at identifying equity funds and stocks that will outperform the market. While this question allows us to identify a "better than average" effect in the aggregate, it does not necessarily capture overconfidence at the individual level. For instance, we find that respondents with above median confidence are 15.8 percentage points more likely to answer both questions on financial literacy correctly ($p < 0.001$). Some of the more confident respondents might thus be more confident in their own ability not only because they are overconfident but also because they are more knowledgeable.

Panel B of Table 3 shows that respondents update their beliefs about the benefits of passive investing very similarly irrespective of whether they have high or low confidence. For instance, as shown in column 2, treated low confidence respondents

are 18.5 percentage points more likely to think that index funds will outperform active funds in the future ($p < 0.001$) while treated high confidence respondents are 21.8 percentage points more likely to think this, a 3.3 percentage points difference that is not statistically significant ($p = 0.535$). Column 5 provides suggestive evidence that high confidence respondents react less to the information in terms of intended behavior: while low confidence respondents plan to increase the index fund share of their portfolio by 10.0 percentage points ($p < 0.001$), high confidence investors only plan to increase their index share by 3.9 percentage points ($p = 0.15$). While this 6.1 percentage points difference is substantial, it is not statistically significant at conventional levels ($p = 0.108$).

Gender differences Finally, Panel C of Table 3 reveals that there are no substantial gender differences in response to the treatment. Female and male respondents change their beliefs about whether index funds will outperform active funds by, respectively, 20.7 percentage points ($p < 0.001$) and 19.5 percentage points ($p < 0.001$), a negligible 1.2 percentage points difference that is not statistically significant ($p = 0.819$). In terms of stated intentions on portfolio allocations, female respondents increase their planned index share by 8.9 percentage points ($p = 0.001$) compared to only 5.3 percentage points among male respondents ($p = 0.045$); however, this 3.6 percentage points gender difference is not statistically significant ($p = 0.343$).

5 Misperceptions about an individual stock

In addition to investing in actively managed funds, many retail investors try to beat the market by investing in individual stocks. For most retail investors, active trading of individual stocks is a losing game. While retail investors often obtain inferior returns by paying too much in trading fees (Barber and Odean, 2000), they are also more likely to buy individual stocks that are unpopular among institutional investors. For instance, the spectacular rise and fall of the GameStop stock in 2021 resulted in heavy losses for many retail investors.[10] While GameStop was very popular among retail investors, the retail investors were warned by experts in the media about the potential for heavy

[10] 'Moment of Weakness': Amateur Investors Left Counting GameStop Losses," Madison Darbyshire, Robin Wigglesworth, and Alice Kantor. *Financial Times*, February 5, 2021.

losses.[11] Many of these retail investors might have bought GameStop and other popular "meme stocks," such as AMC and BlackBerry, because of misperceptions about their fundamental values (Pedersen, 2022). In early January 2021, a similar case occurred on the Oslo Stock Exchange when stock market professionals and financial journalists warned retail investors against buying shares in NAS.

Even though experts predicted a sharp fall in the NAS share price and professional investors fled the stock, it remained popular among retail investors. Misperceptions about the fundamental value of the NAS stock, potentially arising from limited attention to financial news and company reports, might have contributed to the continued popularity of the NAS stock among retail investors. To investigate whether correcting these misperceptions would make retail investors more likely to sell the stock, we ran a second field experiment with a sample of retail investors with shares in NAS in early 2021.

5.1 Background and setting

In January 2021, NAS was in severe financial trouble and had recently sought bankruptcy protection. Around this time, it was one of the most popular stocks in Norway, and 12% of the investors on the OSE owned shares in NAS. On January 14, 2021, NAS announced a rescue package which involved a heavily discounted equity raising that would leave existing investors with only 5% of the shares in the company. The new shares would be issued at an implied price of around NOK 7–9, a close to 90% discount compared to January 2021 prices.[12] Although the details of the rescue package were publicly available, including the terms for the upcoming deeply discounted equity raising that implied a new share price of around NOK 7–9, the NAS stock still traded at prices around NOK 60–70 in January 2021. This led financial journalists and market professionals to proclaim that the stock was overpriced. As the leading business newspaper in Norway put it, "there are obviously many people who do not understand that buying NAS at NOK 66 is throwing money out of the window."[13] However,

[11] "What's the $23 Billion GameStop Really Worth? Maybe $2 Billion," Olga Kharif. *Bloomberg*, January 27, 2021.

[12] We explain why the stock dilution implied a new price of around NOK 7–9 in Section B of the Online Appendix.

[13] "Det burde være en lov som forbød å kjøpe Norwegian på dagens kurser," Thor Jensen. *Dagens Næringsliv*, January 15, 2021.

while professional investors fled the stock, it remained popular among retail investors. We exploit this unique setting to examine whether there is scope to reduce potential misperceptions about the fundamental value of NAS and make retail investors more likely to sell the stock.[14]

5.2 Experiment 3: Sample and experimental design

Sample As in Experiment 1, we recruited respondents by sending out private messages on the Shareville platform. We contacted 3,466 Norwegian retail investors who owned stocks in NAS and got 130 valid completes, implying an overall response rate of 3.8%.

Introductory screen As in the main experiment, we first provide respondents with basic information about the survey. Respondents are told that 10 participants will receive a NOK 500 gift card (or a USD 100 Amazon gift card) for completing the survey. We ask respondents to provide their Shareville username so that we can re-contact gift card winners. Collecting usernames also allows us to match the survey data with trading data from Shareville.

Pre-treatment questions We first ask whether respondents own stocks in NAS. If they answer "no," they are screened out of the survey. On the next screen, we ask respondents whether they think the benchmark index of the OSE (OSEBX)and the share price of NAS will rise or fall over the next 12 months. On the following screen, they are asked by how much percent they think the OSEBX and NAS will rise or fall over the next 12 months.

Information treatment Respondents are next randomized into a treatment group and a control group. Those in the treatment group are shown a one-minute video explaining why the stock is likely to be overpriced. The video features investment director and portfolio manager Robert Næss from Nordea Investment Management. He is one of

[14] On May 27, 2021, the day the discounted stocks entered the market, the share price plummeted to NOK 10.5, leading to large losses for retail investors who had kept ownership of the stock. We provide more institutional details, including a discussion around limitations on short selling, in Section B of the Online Appendix.

the most profiled portfolio managers in the Norwegian financial press.[15] Importantly, he has been featured in many articles about the pricing of NAS and has repeatedly warned retail investors against buying the stock. The content of the informational video treatment, while created for the purpose of the survey, did not differ from his messages in the media.[16]

In the video, the portfolio manager informs the treated respondents that new equity will soon be trading at a 85%–90% discount compared to the current stock price. He concludes that the share price is guaranteed to be significantly lower in a few months and that those who own Norwegian stocks at current prices will lose money. He ends the video with a clear advice: "you should definitely sell the stocks you own now." While this information treatment is very explicit and could plausibly induce some experimenter demand effects on our post-treatment survey measures, we are mainly interested in whether the information treatment leads respondents to actually sell the stock after the experiment.

Post-treatment survey questions We ask two post-treatment questions. We first ask respondents about the probability that they will have NAS in their portfolio in one week. We next ask what they think is the probability that the share price of NAS will fall by more than 50% over the next 12 months. The respondents answer both questions by moving a slider between 0% and 100%.

Post-treatment trading data To examine whether the information treatment actually makes treated respondents more likely to sell the stock, we hand-collect administrative data on trading behavior on May 28, 2021, one day after the new shares issued started trading in the market. By this time, as shown in Figure A.7, the stock had lost 65% of its value compared to February 1, 2021, when the survey was in the field and we informed treated respondents about the overpricing.[17] Our main outcome of interest

[15]Robert Næss is one of the most successful fund managers in Norway. He manages the USD 1.3B fund "Nordea Stabile Aksjer Global Etisk," which has delivered an annualized return of 14.15% over the last 10 years (`https://www.morningstar.no/no/funds/snapshot/snapshot.aspx?id=F000002BUC`; accessed September 28, 2022) and won multiple awards for best globally managed fund offered by Norwegian banks. He is also the father of Ole-Andreas Næss.

[16]The video with the English annotations is available at the following link: `https://youtu.be/thf-9BWFd0g`. Screenshots of the actual survey in Norwegian are provided in Section J, and English translations of the survey are provided in Section F.

[17]The 65% fall includes the option value from buying 1.5 new shares for each existing share at a discount. For investors who did not use this option, the actual loss between February 1 and May 25 was

is whether the respondents have sold the NAS stock. We can collect data on sales as all individual trades are listed on the respondents' Shareville wall. For example, if someone buys NAS on Shareville or through a Nordnet account linked with their Shareville account, their Shareville profile will be automatically updated with a new post with details about the trade, including the stock price and the transaction date (but not including how many stocks were traded). As an example, as shown in Figure A.8, the user Ole-Andreas sold NAS through his Nordnet account on February 1, 2021, and his Shareville profile was automatically updated the following post the same day: "Ole-Andreas sold NORWEGIAN AIR SHUTTLE at the price 60.46 NOK." We can thus observe not only whether respondents have sold NAS during the time period but also the exact date on which they sold the stock.

5.3 Experiment 3: Results

Pre-treatment beliefs As shown in Figure A.9, the respondents have very heterogeneous beliefs about how the NAS stock's share price will develop. The median respondent thinks the share price will increase by 4% over the next 12 months. While around 20% of the respondents have very pessimistic (and ex-post accurate) beliefs and think the share price will decrease by 50% or more, more than 25% think that the share price will increase by 25% or more over the next 12 months.

Treatment effects on survey outcomes Table 4 shows the treatment effects. As shown in column 1, treated respondents are 5.3 percentage points (or 10.1%) more likely to think that the NAS stock will lose more than 50% of its value over the next 12 months, though the effect is not statistically significant ($p = 0.223$). However, we see a large and statistically significant effect on sales intentions: treated respondents are 14.1 percentage points more likely to plan to sell the NAS stock ($p = 0.017$), corresponding to a 93.5% increase compared to the control group mean of 15.1%.

Actual trading behavior One day after participating in the experiment, 20.7% of treated respondents have sold the NAS stock compared to 0.0% of control group respondents. A sizable fraction of treated respondents thus sells the stock immediately

84%.

after receiving the information treatment. As shown in column 3 of Table 4, the short-term treatment effect is highly statistically significant ($p < 0.001$).[18]

Columns 4–6 of Table 4 show that this treatment effect persists over time. After one week, we still see a treatment effect of 21.1 percentage points. After three months, when 22.5% of control group respondents have sold the stock, we also still see a persistent treatment effect of 19.7 percentage points that remains statistically significant ($p = 0.02$). In other words, the short-term treatment effect observed one day after the experiment does not seem to be driven by respondents who planned to sell the stock anyway. Instead, the persistent effect on sales behavior is consistent with a sizable fraction of respondents immediately acting on new information.

Our fourth main result can be summarized as follows.

Result 4. Information that corrects misperceptions about an individual stock has a large impact on trading behavior among retail investors. One day after receiving information about an upcoming deeply discounted equity raising, treated respondents are 20.6 percentage points more likely than control group respondents to have sold the stock ($p < 0.001$). This effect persists three months after the experiment.

5.4 Experiment 4: Mechanisms

To explore some potential mechanisms behind our results from Experiment 3, we ran a survey experiment with YouGov on a representative sample of the Norwegian population. The survey experiment largely follows the structure of Experiment 3 but includes some additional questions and has the benefit of a larger sample. Screenshots of the original instructions are included in Section K, while translations of the main questions not included in Experiment 3 are included in Section F.

5.4.1 Sample and experimental design

Sample We collected a sample of 1,008 Norwegian respondents in collaboration with YouGov. The survey was fielded between February 12 and February 17, 2021 (i.e., around two weeks after Experiment 3). As shown in Figure A.7, the share price of

[18] In the regressions, we employ robust HC3 standard errors. Long and Ervin (2000) recommend HC3 standard errors with sample sizes below 250 and find that they work well with sample sizes as low as 25.

NAS was quite stable during this period, making the treatment equally relevant for respondents in this experiment. In our main analysis, we focus on the 472 respondents who report owning mutual funds or individual stocks.

Experimental design The survey largely follows the structure of Experiment 3. We ask the same pre-treatment questions about the expected 12-month return of the NAS share price and the benchmark index of the OSE (OSEBX). In addition, we ask how frequently they read financial news, how much they have read about NAS in the media during the last 30 days, and how much they think they know about mutual funds and stocks. We then randomize respondents into a control group and a treatment group in which treated respondents are shown the same video clip as in Experiment 3. For respondents who said they own NAS shares, we next ask about the likelihood that they will sell NAS shares within a week. For the remaining respondents, we ask about the likelihood that they would have sold NAS shares within a week if they had owned the shares. We finally ask respondents how likely they think it is that the NAS share price will fall by more than 50% in the following 12 months.

5.4.2 Results

Correlations Table 5 examines correlations between different pre-treatment characteristics and beliefs about future 12-month returns of the NAS share price (Panel A) and the OSEBX (Panel B). Among our 472 respondents active in the stock market, 15.2% own shares in NAS. We first examine whether NAS owners have more optimistic beliefs about the future NAS share price development. As shown in Panel A of column 1, NAS owners think that 12-month returns will be 21.1 percentage points higher than non-owners ($p < 0.001$). This effect is not due to NAS owners generally being much more optimistic about the stock market: as shown in Panel B, NAS owners think that the OSEBX will provide only 2.1 percentage points higher 12-month returns than non-owners ($p = 0.445$). We also observe that those who frequently read financial news (column 2) and those who have read about NAS in the media during the last 30 days (column 3) have significantly more pessimistic beliefs about the future NAS share price, suggesting that limited attention to financial news led some retail investors to form overly optimistic beliefs about the NAS share price. Finally, column 4 shows that those with high self-perceived knowledge about the stock market also have much more

pessimistic about the future share price of NAS (but, as shown in Panel B, not about the returns on the OSEBX).

Treatment effects Table 6 shows the treatment effects on post-treatment beliefs and selling intentions. Column 2 shows that treated respondents are 7.5 percentage points (or 15.7%) more likely to think that the NAS stock will fall by more than 50% over the next 12 months ($p < 0.001$). They are also 14.1 percentage points more likely to want to sell the stock ($p = 0.017$), corresponding to a 93.5% increase compared to the control group mean of 15.1% (column 3). These effects are comparable in magnitude to the main results from Experiment 3 with retail investors on Shareville. Splitting the sample based on whether respondents own the NAS share, we see similar point estimates among NAS owners (columns 3–4) and non-owners (columns 5–6). These results underscore the robustness and external validity of our findings from Experiment 3.

6 Concluding remarks

This paper examines whether misperceptions about the returns to active investing can explain why retail investors tend to employ active investment strategies. For this purpose, we run several field experiments with retail investors in which we connect information provision experiments with administrative data on actual investment choices. The main finding of the paper is that correcting misperceptions about the returns to active investing has a lasting and economically significant impact on investment behavior.

In our main experiment on active fund investments, respondents who are informed that index funds outperform active funds after fees increase the index fund share of their portfolio by 4.4 percentage points ($p = 0.011$), corresponding to a 37.7% increase compared to a control group mean of 11.7%. In a second experiment on individual stock investments, respondents who are informed that a stock that they own is likely to be overpriced are 20.6 percentage points more likely than control group respondents to have sold the stock one day after the experiment ($p < 0.001$). These experiments demonstrate that correcting misperceptions among retail investors about the returns to active investing can have a persistent and economically significant impact on actual investment behavior.

French (2008) estimates that a typical active investor could increase his annual return by 67 basis points by adopting a passive investment strategy, demonstrating that active investing is a costly mistake for the typical investor. In his 2008 presidential address to the American Finance Association on the cost of active investing, French asked why active investors "continue to play a negative sum game." Our experimental evidence provides strong support for the conjecture that misperceptions about the returns to active investing is an important driver of the active investment puzzle.

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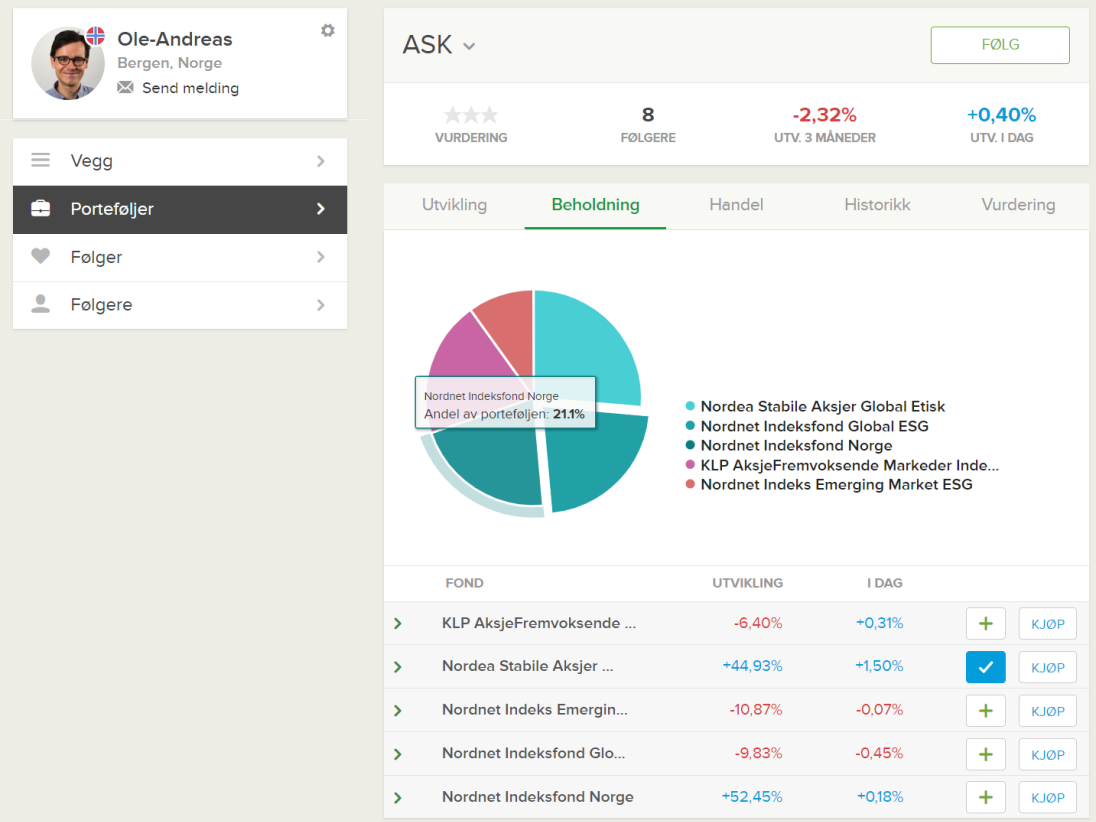
Main Figures and Tables

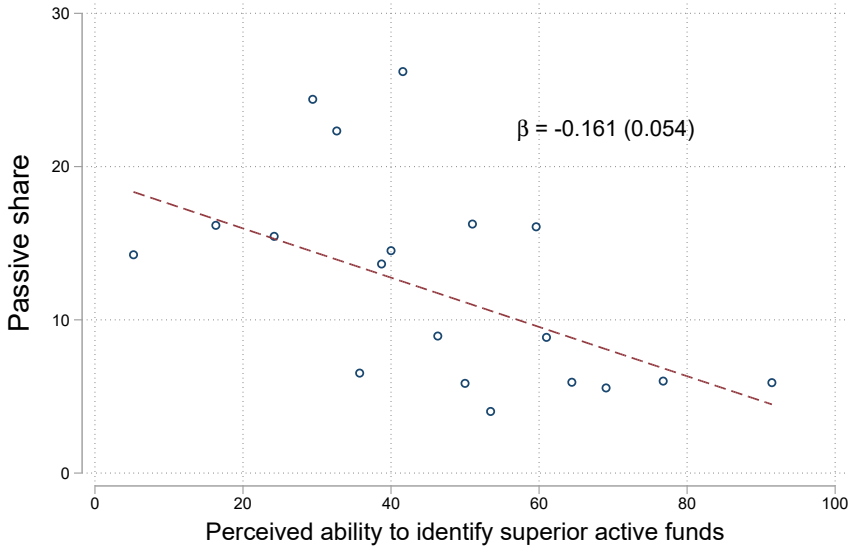
Figure 1: Screenshot of a Shareville account: Portfolio



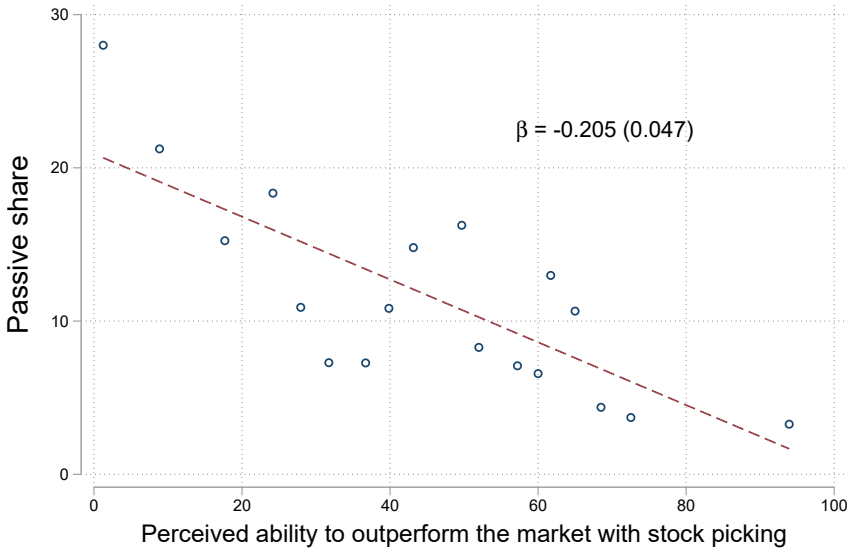
Note: This figure shows a screenshot of a Shareville account's portfolio. The portfolio shares are illustrated in a pie chart where each slice is an asset. This example portfolio has only one active fund (26.6% invested in Nordea Stabile Aksjer Global Etisk) and the remaining funds invested in index funds, giving it an index fund share of 73.4%.

Figure 2: Correlations between survey beliefs and index share

(a) Index share and beliefs about own ability to identify superior funds



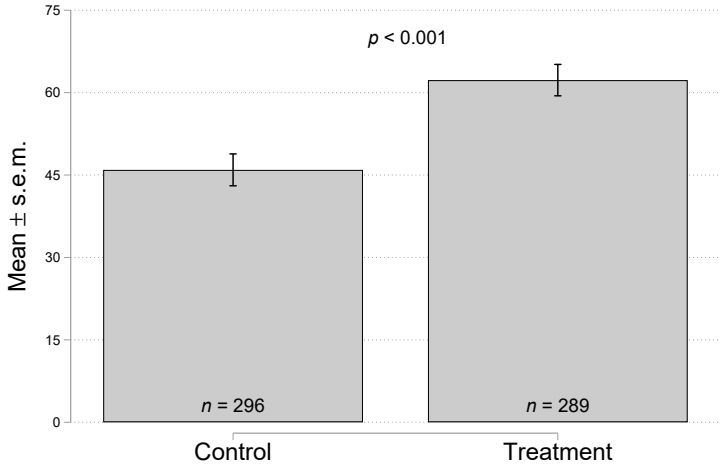
(b) Index share and beliefs about own stock-picking ability



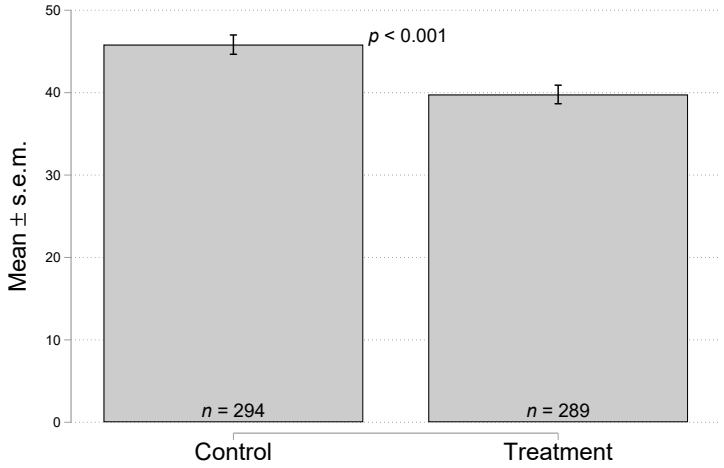
Note: This figure uses data from control group respondents and shows correlations between survey beliefs and actual portfolio choices. Panel A shows a binned scatter plot of the relationship between beliefs about one's own ability to identify superior funds ("What is the probability that over time you will find active funds that will give better returns than comparable index funds (after fees)?") and the index fund portfolio share. Panel B shows a binned scatter plot of the relationship between beliefs about one's own stock-picking abilities ("What is the probability that over time you will be able beat the market by investing in individual stocks?") and the index fund portfolio share. The underlying regression coefficients (with standard errors in parentheses) are indicated in the figures.

Figure 3: Treatment effects: Main experiment

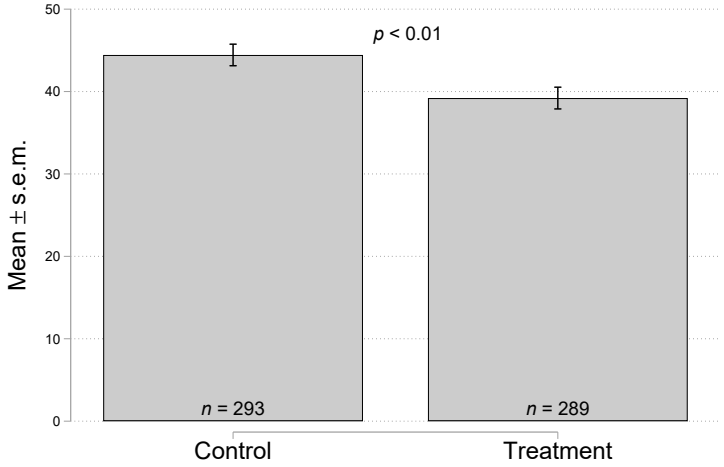
(a) Beliefs: Index funds superior



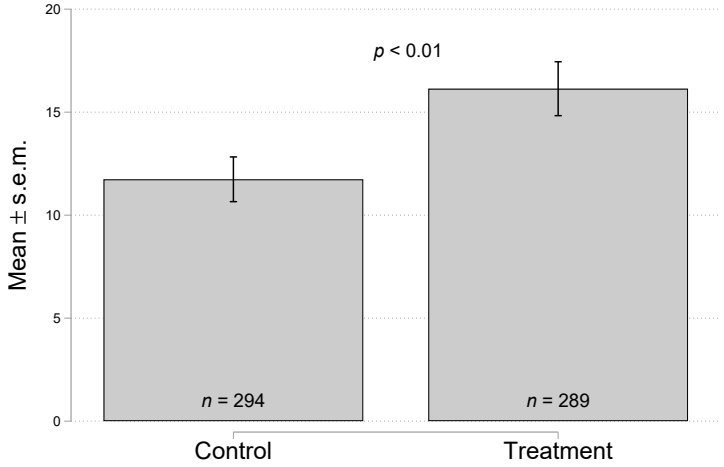
(b) Beliefs: Can identify superior fund



(c) Beliefs: Can beat the market



(d) Portfolio share: Index funds



Note: The figure uses data from Experiment 1 on Shareville and presents raw treatment effects on the main outcomes. The p-values are obtained from a two-sample t-test of equality of means. Error bars indicate the standard error of the mean. In Figure 3a, the variable is an indicator equal to one for respondents who said that index funds will give higher returns than active funds going forward. In Figure 3b, the variable takes values between 0 and 100 in response to the following question: "what is the probability that over time you will find active funds that will give better returns than comparable index funds (after fees)?" In Figure 3c, the variable takes values between 0 and 100 in response to the following question: "what is the probability that over time you will be able to beat the market by investing in individual stocks?" In Figure 3d, the variable takes values between 0 and 100 and refers to the actual index share of their portfolio (collected four months after the experiment).

Table 1: Treatment effects: Experiment 1 (Shareville)

	Post-treatment beliefs				Index share	
	(1) Active superior	(2) Index superior	(3) Superior fund	(4) Beat market	(5) Survey intentions	(6) Shareville portfolio
Panel A: Main effect						
Treatment	-15.32***	17.82***	-6.36***	-5.52***	7.80***	4.41**
	(3.02)	(3.63)	(1.51)	(1.83)	(1.99)	(1.72)
N	585	585	583	582	578	583
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	28.4	45.9	45.8	44.4	32.4	11.7
Panel B: Heterogeneity						
Treatment (a)	-46.09***	28.88***	-10.49***	-7.71*	6.63	10.03***
	(8.52)	(7.31)	(3.33)	(4.46)	(4.14)	(3.83)
Treatment × Similar returns (b)	27.36**	-7.69	2.95	1.86	3.06	-7.12
	(10.59)	(10.79)	(4.52)	(5.77)	(5.78)	(5.28)
Treatment × Index highest (c)	42.11***	-16.03*	5.97	3.03	0.75	-6.81
	(9.21)	(8.76)	(3.91)	(5.06)	(4.94)	(4.43)
Similar returns	-50.58***	20.03***	-12.12***	-5.31	7.16*	5.67*
	(7.92)	(6.30)	(3.28)	(4.05)	(3.99)	(3.37)
Index highest	-63.28***	61.54***	-19.53***	-9.86***	11.93***	6.16**
	(6.31)	(4.99)	(2.79)	(3.51)	(3.43)	(2.39)
Linear combination: a + b	-18.73***	21.19***	-7.54**	-5.84	9.69**	2.92
	(6.29)	(7.91)	(3.03)	(3.69)	(4.05)	(3.69)
Linear combination: a + c	-3.98	12.85***	-4.52**	-4.68*	7.38***	3.22
	(3.47)	(4.82)	(2.05)	(2.39)	(2.70)	(2.22)
N	585	585	583	582	578	583
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Control mean: Active highest	78.6	5.36	61.5	53.0	21.5	6.48

Note: This table shows the main regression estimates. The dependent variable is indicated in each column. Panel A shows average treatment effects, while Panel B shows treatment heterogeneity by the following pre-treatment beliefs about the returns to active investments. *Active superior* is an indicator equal to one for respondents who said that active funds will give higher returns than index funds going forward. *Index superior* is an indicator equal to one for respondents who said that index funds will give higher returns than active funds going forward. *Superior fund* takes values between 0 and 100 in response to the following question: "what is the probability that over time you will find active funds that will give better returns than comparable index funds (after fees)?" *Beat market* takes values between 0 and 100 in response to the following question: "what is the probability that over time you will be able to beat the market by investing in individual stocks?" *Survey intentions* takes values between 0 and 100 and refers to plans about the index fund portfolio share. *Shareville portfolio* takes values between 0 and 100 and refers to the actual index share of their portfolio (collected four months after the experiment). *Treatment* is an indicator equal to one for respondents assigned to the information treatment. *Similar returns* takes the value one for respondents who said that "Active funds and index funds have given about equal returns." *Index highest* takes the value one for respondents who said that "Index funds have given the highest returns." All regressions include basic controls (pre-treatment survey beliefs about whether index funds or active funds give higher returns and about autocorrelation in stock returns).

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.

Table 2: Treatment effects: Experiment 2 (YouGov)

	Post-treatment beliefs				Index share
	(1) Active superior	(2) Index superior	(3) Superior fund	(4) Beat market	(5) Survey intentions
Panel A: Main effect					
Treatment	-10.64***	20.08***	-1.76	-0.79	6.98***
	(2.57)	(2.67)	(1.28)	(1.42)	(1.90)
N	1,005	1,005	1,005	1,005	1,005
Controls	Yes	Yes	Yes	Yes	Yes
Control mean	30.8	25.2	45.4	39.6	39.8
Panel B: Heterogeneity					
Treatment (a)	-27.90***	29.57***	-1.93	0.23	13.10***
	(4.80)	(4.02)	(2.02)	(2.27)	(2.90)
Treatment × Similar returns (b)	30.63***	-12.76**	0.26	-1.03	-8.09*
	(6.28)	(6.10)	(2.97)	(3.27)	(4.36)
Treatment × Index highest (c)	25.68***	-19.76***	0.34	-2.60	-12.97***
	(5.90)	(6.93)	(3.19)	(3.60)	(4.80)
Similar returns	-40.89***	8.14**	-2.92	-0.86	10.50***
	(4.54)	(3.51)	(2.02)	(2.21)	(3.04)
Index highest	-48.11***	55.33***	-7.07***	-1.41	27.41***
	(4.61)	(4.95)	(2.27)	(2.56)	(3.46)
Linear combination: a + b	2.73	16.81***	-1.67	-0.80	5.02
	(4.04)	(4.55)	(2.19)	(2.37)	(3.26)
Linear combination: a + c	-2.22	9.81*	-1.59	-2.37	0.14
	(3.49)	(5.65)	(2.50)	(2.80)	(3.84)
N	1,005	1,005	1,005	1,005	1,005
Controls	Yes	Yes	Yes	Yes	Yes
Control mean: Active highest	59.1	8.81	48.2	39.6	29.2

Note: This table shows the main regression estimates from Experiment 2 (the survey experiment with the nationally representative sample). The dependent variable is indicated in each column. Panel A shows average treatment effects, while Panel B shows treatment heterogeneity by the following pre-treatment beliefs about the returns to active investments. *Active superior* is an indicator equal to one for respondents who said that active funds will give higher returns than index funds going forward. *Index superior* is an indicator equal to one for respondents who said that index funds will give higher returns than active funds going forward. *Superior fund* takes values between 0 and 100 in response to the following question: "what is the probability that over time you will find active funds that will give better returns than comparable index funds (after fees)?" *Beat market* takes values between 0 and 100 in response to the following question: "what is the probability that over time you will be able to beat the market by investing in individual stocks?" *Survey intentions* takes values between 0 and 100 and refers to plans about the index fund portfolio share. *Treatment* is an indicator equal to one for respondents assigned to the information treatment. *Similar returns* takes the value one for respondents who said that "active funds and index funds have given about equal returns." *Index highest* takes the value one for respondents who said that "Index funds have given the highest returns."

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.

Table 3: Treatment heterogeneity by different characteristics: Experiment 2 (YouGov)

	Post-treatment beliefs				Index share
	(1) Active superior	(2) Index superior	(3) Superior fund	(4) Beat market	(5) Survey intentions
Panel A: Financial literacy					
Treatment (a)	-8.02**	12.02***	-1.82	1.07	5.00*
	(3.70)	(3.98)	(1.88)	(2.13)	(2.80)
Treatment × High literacy (b)	-4.94	15.23***	0.11	-3.52	3.74
	(5.13)	(5.32)	(2.56)	(2.83)	(3.81)
Linear combination: a + b	-12.96***	27.24***	-1.70	-2.45	8.73***
	(3.56)	(3.56)	(1.74)	(1.88)	(2.59)
N	1,005	1,005	1,005	1,005	1,005
Controls	Yes	Yes	Yes	Yes	Yes
Control mean: Low literacy	26.7	25.9	48.7	41.6	37.7
Control mean: High literacy	34.8	24.5	42.1	37.7	41.9
Panel B: Confidence					
Treatment (a)	-10.13***	18.50***	-1.65	-1.26	10.00***
	(3.66)	(3.70)	(1.98)	(2.12)	(2.67)
Treatment × High confidence (b)	-0.96	3.31	-0.24	0.79	-6.11
	(5.08)	(5.33)	(2.54)	(2.84)	(3.80)
Linear combination: a + b	-11.09***	21.81***	-1.90	-0.47	3.89
	(3.58)	(3.85)	(1.60)	(1.89)	(2.70)
N	1,005	1,005	1,005	1,005	1,005
Controls	Yes	Yes	Yes	Yes	Yes
Control mean: Low confidence	32.0	22.1	47.2	38.6	37.6
Control mean: High confidence	29.5	28.3	43.6	40.7	42.1
Panel C: Gender					
Treatment (a)	-8.68**	20.73***	-3.05	-2.58	8.87***
	(3.61)	(3.95)	(1.87)	(2.09)	(2.76)
Treatment × Male (b)	-3.74	-1.24	2.47	3.41	-3.61
	(5.12)	(5.40)	(2.56)	(2.83)	(3.81)
Linear combination: a + b	-12.42***	19.49***	-0.58	0.83	5.26**
	(3.65)	(3.66)	(1.75)	(1.92)	(2.62)
N	1,005	1,005	1,005	1,005	1,005
Controls	Yes	Yes	Yes	Yes	Yes
Control mean: Female	24.6	25.4	45.4	39.4	41.3
Control mean: Male	36.0	25	45.4	39.8	38.5

Note: This table shows heterogeneous effects from Experiment 2 (the survey experiment with the nationally representative sample). *Active superior* is an indicator equal to one for respondents who said that active funds will give higher returns than index funds going forward. *Index superior* is an indicator equal to one for respondents who said that index funds will give higher returns than active funds going forward. *Superior fund* takes values between 0 and 100 in response to the following question: "what is the probability that over time you will find active funds that will give better returns than comparable index funds (after fees)?" *Beat market* takes values between 0 and 100 in response to the following question: "what is the probability that over time you will be able to beat the market by investing in individual stocks?" *Survey intentions* takes values between 0 and 100 and refers to plans about the index fund portfolio share. *Treatment* is an indicator equal to one for respondents assigned to the information treatment. "High literacy" is an indicator equal to one if both pre-treatment questions about financial literacy were correctly answered. "High confidence" is an indicator equal to one if the respondent has above median confidence in their own ability to outperform the market. "Male" is an indicator equal to one for male respondents and equal to zero for female respondents.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.

Table 4: Treatment effects: Experiment 3 (Shareville)

	(1) Post beliefs	(2) Sales intention	(3) Sold 1 day	(4) Sold 1 week	(5) Sold 1 month	(6) Sold 3 months
Treatment	5.275	0.141**	0.206***	0.211***	0.184**	0.197**
	(4.371)	(0.059)	(0.054)	(0.070)	(0.077)	(0.085)
N	121	121	129	129	129	129
Z-scored	No	No	No	No	No	No
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Control group mean	52.04	0.151	0	0.0845	0.141	0.225

Note: The table shows the OLS regression result from Experiment 3 with retail investors on Shareville. "Treatment" takes the value one if the respondent was in the treatment group that received information about the NAS overpricing and is zero otherwise. "Post beliefs" is post-treatment beliefs about the likelihood that the NAS stock will lose more than 50% of its current value. "Sales intention" is the subjective likelihood of selling NAS stocks within the next seven days. "Sold 1 day" takes the value one if the respondent had sold NAS stocks within one day after participating in the experiment. "Sold 1 month" and "Sold 3 months" are defined analogously for 1 and 3 months. We include pre-treatment beliefs about the returns on NAS and the OSEBX as controls.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust HC3 standard errors in parentheses.

Table 5: Experiment 4 (YouGov): Correlates of beliefs about future returns

	(1)	(2)	(3)	(4)
Panel A: NAS returns				
Own NAS shares	21.08***			
	(5.04)			
Frequent news consumption		-17.96***		
		(3.98)		
Read about NAS			-6.13**	
			(2.96)	
High knowledge				-25.24***
				(8.26)
Constant	-8.13***	0.80	-0.58	-2.56
	(1.70)	(1.64)	(2.00)	(1.58)
Observations	472	472	472	472
Panel B: OSEBX returns				
Own NAS shares	2.12			
	(2.77)			
Frequent news consumption		0.51		
		(1.34)		
Read about NAS			-0.42	
			(1.20)	
High knowledge				-2.05
				(2.92)
Constant	4.92***	5.08***	5.54***	5.44***
	(0.49)	(0.67)	(0.95)	(0.58)
Observations	472	472	472	472

Note: The table shows the OLS regression result from Experiment 4 with survey respondents from YouGov. The dependent variable in Panel A is beliefs about the future 12-month return of the NAS share price (top coded at 100%). The dependent variable in Panel B is beliefs about future 12-month returns of the Oslo Stock Exchange Benchmark Index (OSEBX). "Own NAS shares" is a binary variable equal to one for respondents who own NAS shares and is zero otherwise. "Frequent news consumption" is a binary variable equal to one for respondents who read financial news frequently and is zero otherwise. "Read about NAS" is a binary variable equal to one for respondents who have read news about NAS in the media during the last 30 days and is zero otherwise. "High knowledge" is a binary variable equal to one for respondents who think they have high knowledge about the stock market and is zero otherwise.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.

Table 6: Treatment effects: Experiment 4 (YouGov)

	Full sample		NAS owners		Non-owners	
	(1) Post beliefs	(2) Sales intention	(3) Post beliefs	(4) Sales intention	(5) Post beliefs	(6) Sales intention
Treatment	8.20***	12.35***	9.36	8.37	8.00***	13.05***
	(2.24)	(2.69)	(5.81)	(7.57)	(2.43)	(2.85)
N	472	472	72	72	400	400
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Control group mean	47.98	45.92	49.49	38.51	47.71	47.26

Note: The table shows the OLS regression result from Experiment 4 with survey respondents from YouGov. "Treatment" is an indicator taking the value of one if the respondent was in the treatment group who received information about the NAS overpricing and is zero otherwise. "Post beliefs" takes values between 0 and 100 and refers to post-treatment beliefs about the likelihood that the NAS stock will lose more than 50% of its current value. "Sales intention" takes values between 0 and 100 and refers to the subjective probability of selling the NAS stock within the next seven days (for NAS owners) and the subjective probability of selling the stock within the next seven days if they had hypothetically owned the stock (for non-owners).

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Robust HC3 standard errors in parentheses.

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Misperceived Returns to Active Investing

Ingar Haaland and Ole-Andreas Elvik Næss

A Appendix Tables and Figures

Table A.1: Selection into the survey: Invited versus survey takers

	Responded (R)	Invited (I)	P-value (R - I)	Observations
Portfolio returns (last six months)	18.19	13.19	0.000	13,937
Number of trades (last month)	7.98	3.52	0.000	15,667
Number of passive funds in portfolio	2.04	1.75	0.020	15,667

Note: This table provides a test of significant differences between survey takers and invited users.

Table A.2: Balance table: Treatment versus control

	Treatment (T)	Control (C)	P-value (T - C)	Observations
Higher returns on active funds	0.18	0.19	0.729	584
Higher returns on index funds	0.55	0.59	0.328	584
Portfolio returns (last six months)	17.51	20.80	0.168	509
Number of trades (last month)	8.01	7.48	0.664	575
Number of passive funds in portfolio	1.88	1.83	0.821	574

Note: This table provides a balance test between the treatment and the control group. "Higher returns on active funds" is a binary variable equal to one for respondents with pre-treatment beliefs that active funds had outperformed index funds. "Higher returns on index funds" is a similar indicator for index funds.

Figure A.1: Experiment 1: Overview

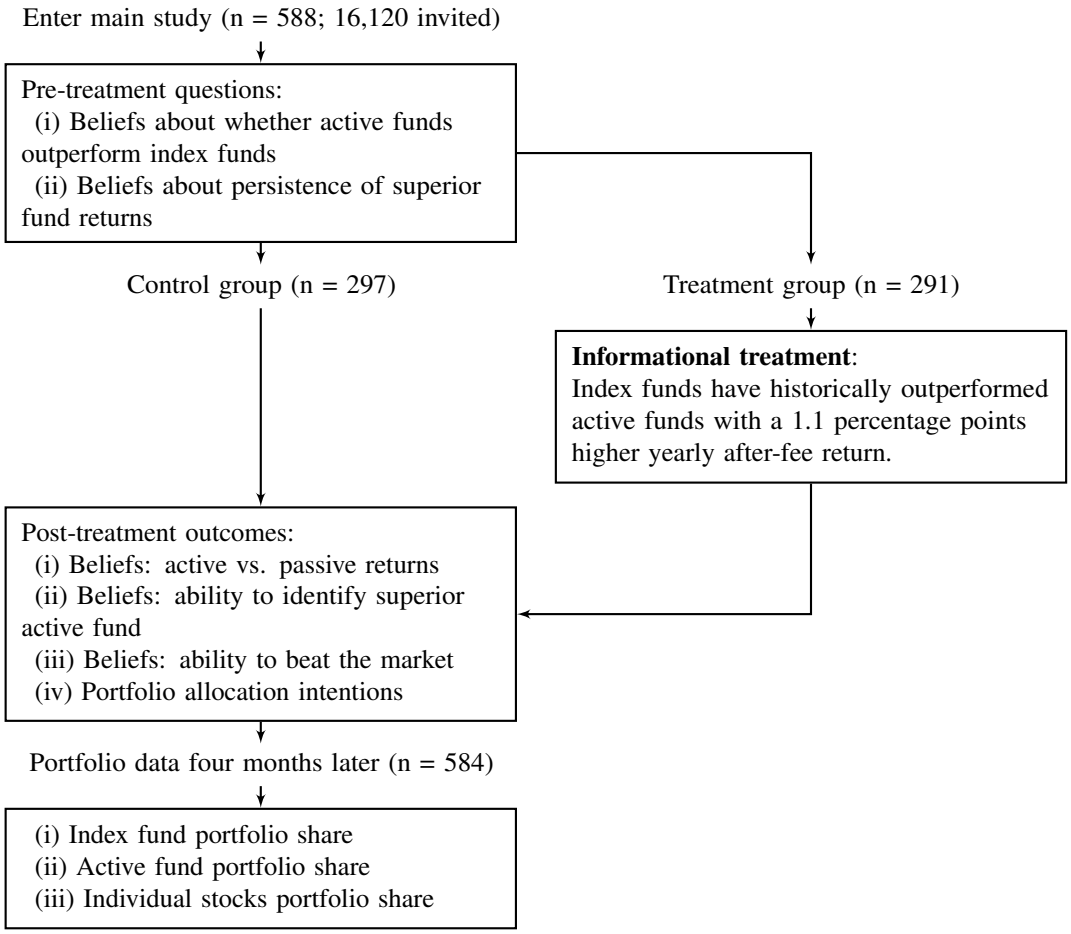
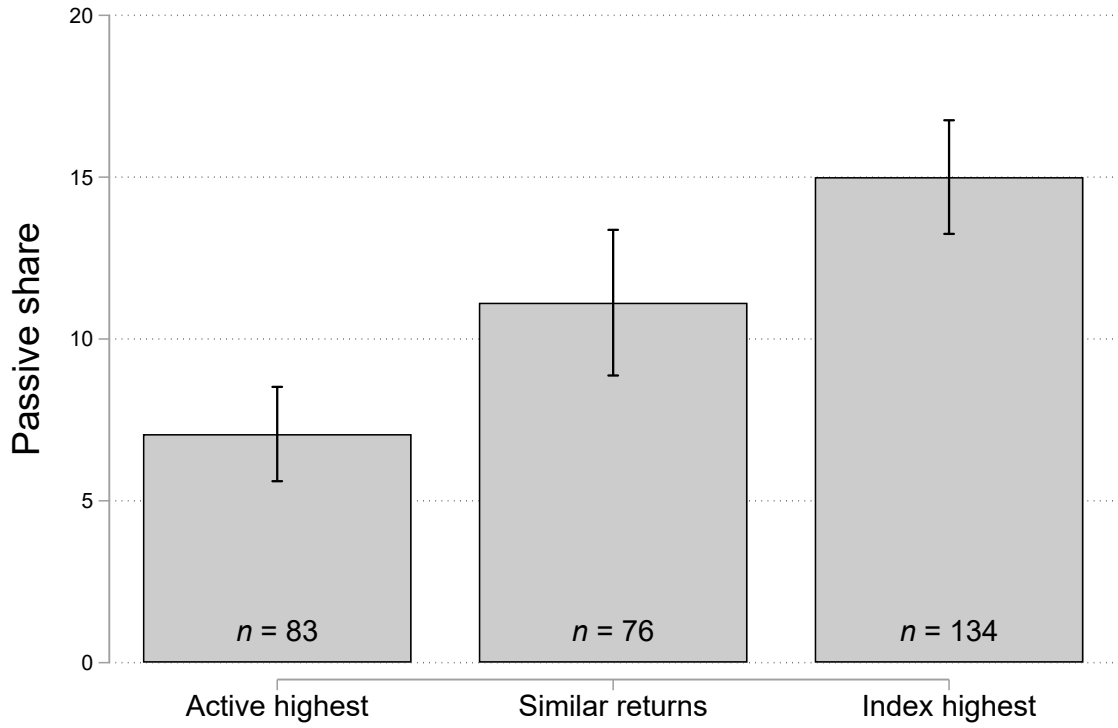
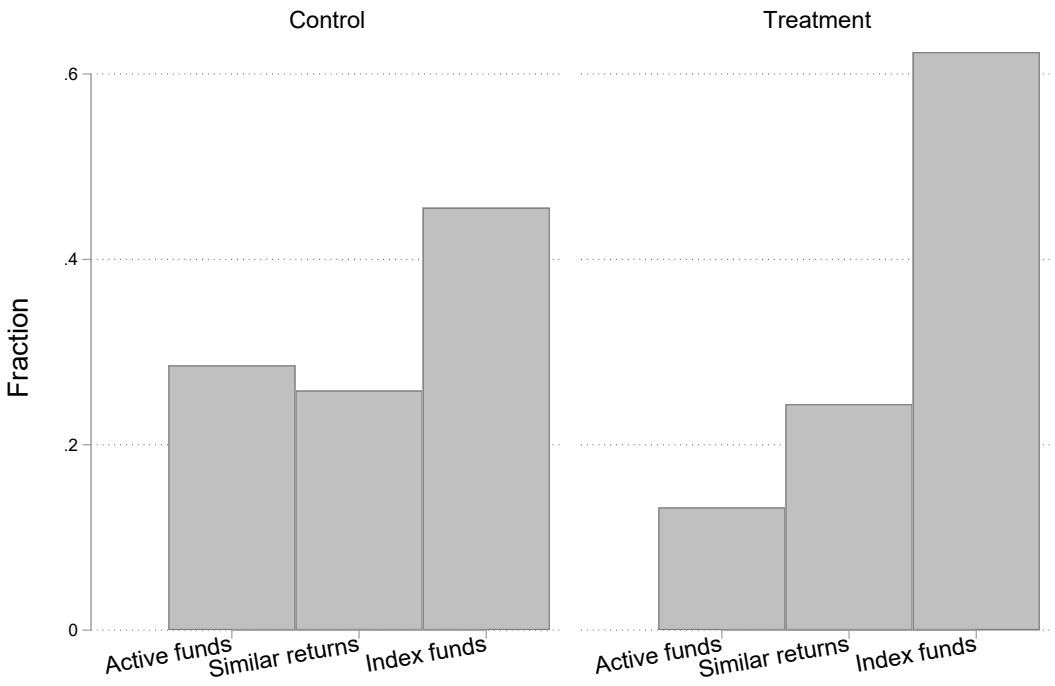


Figure A.2: Index share and beliefs about future fund returns



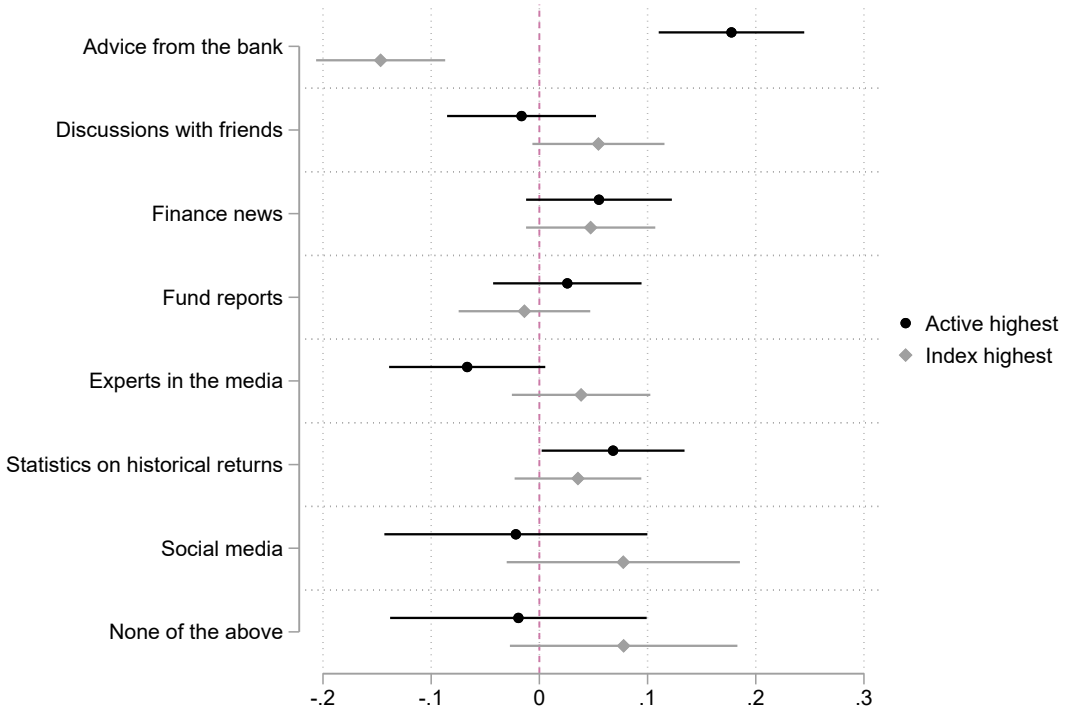
Note: This figure uses data from Experiment 1 (Shareville) and shows correlations between beliefs about whether active or passive funds will give the highest returns ("Do you think active funds or index funds will give the highest returns going forward (after fees)?") and the index fund portfolio share. Error bars indicate the standard error of the mean.

Figure A.3: Post-treatment beliefs about fund returns



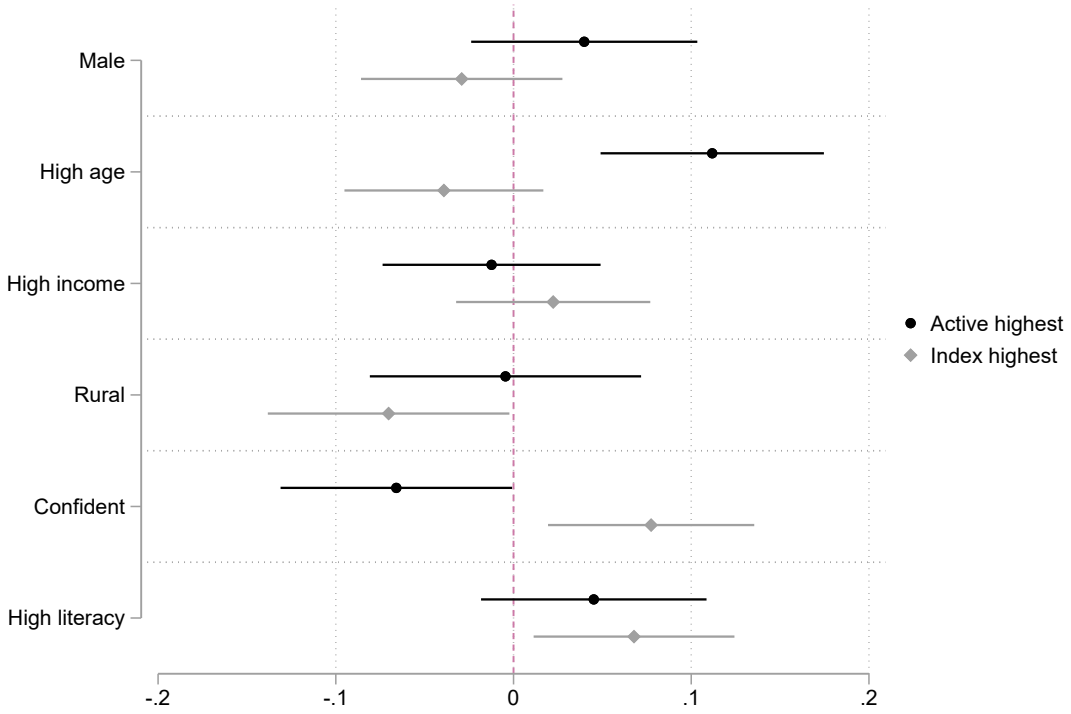
Note: This figure uses data from Experiment 1 (Shareville) and shows the distribution of post-treatment beliefs about the returns to active versus passive investment separately for respondents in the treatment and the control group. Beliefs were elicited using the following question: "do you think active funds or index funds will give the highest returns going forward (after fees)?" with the following response options: (i) active funds will give higher returns than index funds, (ii) active funds and index funds will give about equal returns, and (iii) index funds will give higher returns than active funds.

Figure A.4: Correlates between informational sources and beliefs about historical fund returns: Experiment 2 (YouGov)



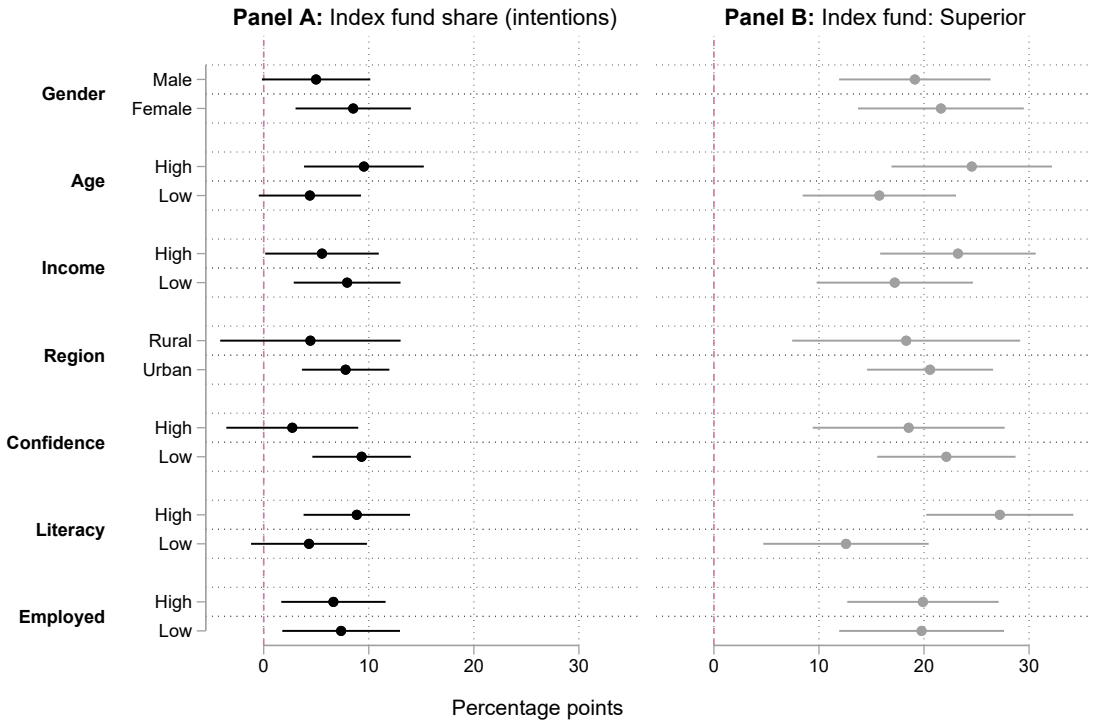
Note: This figure uses data from the survey experiment with YouGov (Experiment 2) and shows multiple regression estimates in which the dependent variables are pre-treatment beliefs about whether active funds or index funds have given the highest returns over the last 20 years. The independent variables are indicator variables taking the value one if the respondent said they relied on the source when choosing an equity fund (respondents could indicate multiple sources). 95% confidence intervals are indicated in the figure.

Figure A.5: Correlates between informational sources and background characteristics: Experiment 2 (YouGov)



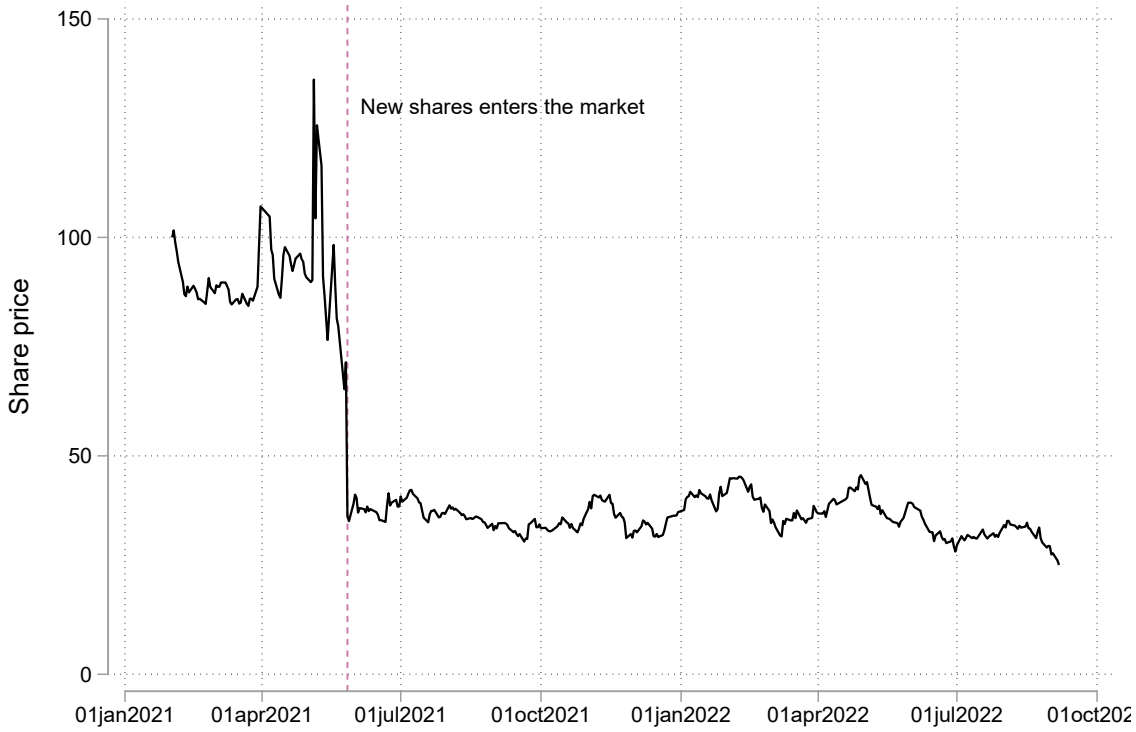
Note: This figure uses data from the survey experiment with YouGov (Experiment 2) and shows multiple regression estimates in which the dependent variables are pre-treatment beliefs about whether active funds or index funds have given the highest returns over the last 20 years. The independent variables are indicator variables taking the value one for each sub-group indicated in the figure. 95% confidence intervals are indicated in the figure.

Figure A.6: Heterogeneity in treatment effects: Experiment 2 (YouGov)



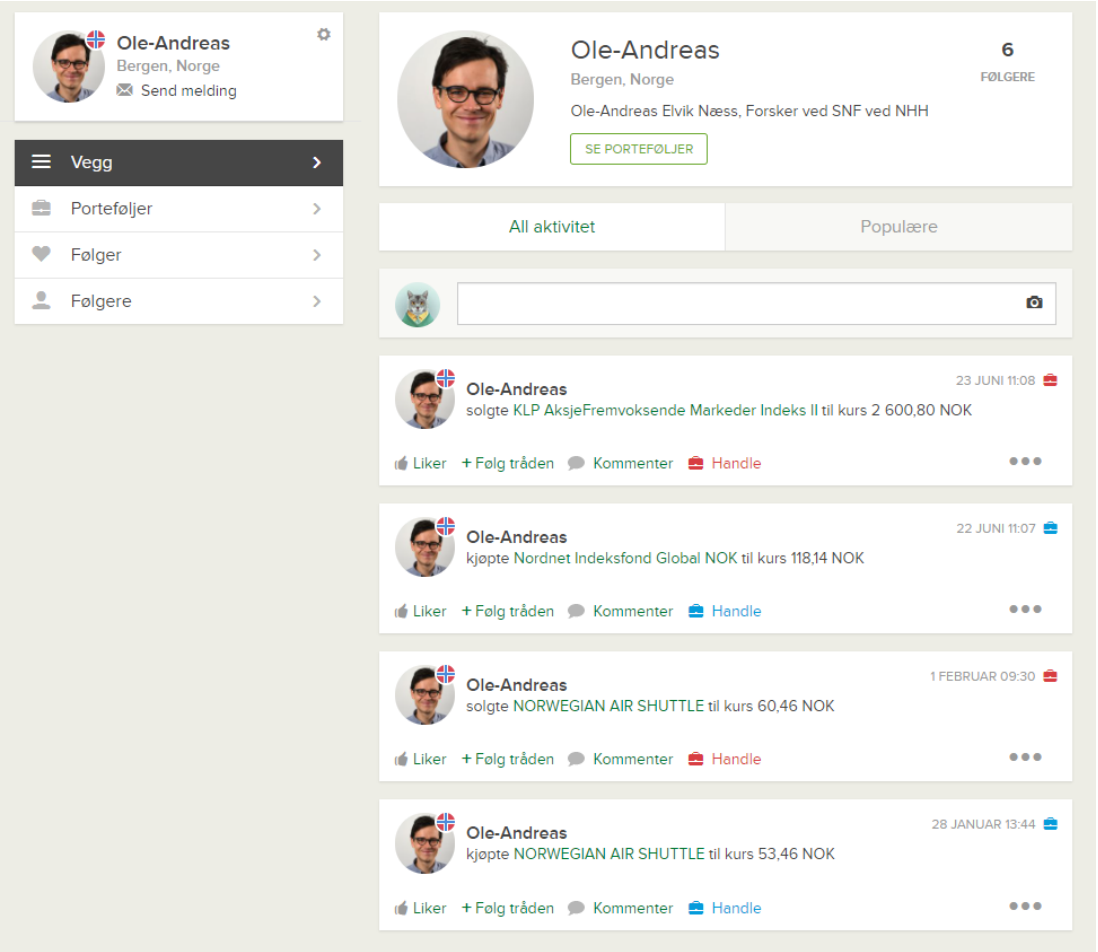
Note: This figure uses data from the survey experiment with YouGov (Experiment 2) and shows regression estimates in which the main outcomes are regressed on the treatment indicator separately for each sub-group indicated in the figure. *Index fund share (intentions)* refers to self-reported plans about the portfolio index fund share (between 0% and 100%). *Index fund: Superior* is an indicator equal to one for respondents who said that index funds will give higher returns than active funds going forward. 95% confidence intervals are indicated in the figure.

Figure A.7: Share price: Norwegian Air Shuttle



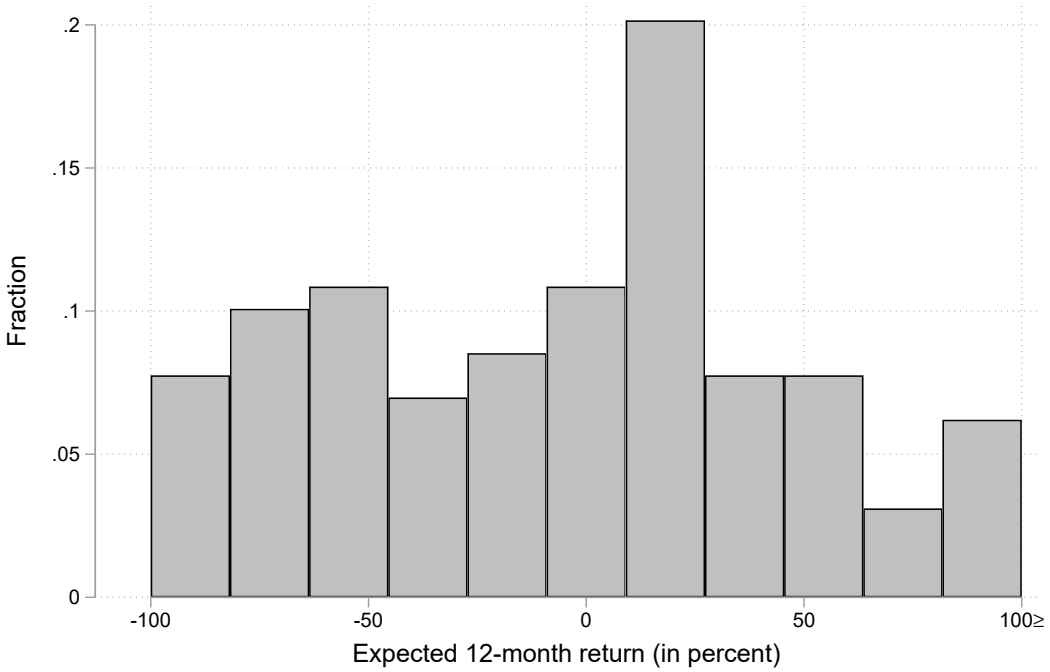
Note: This figure uses data from Euronext (`https://live.euronext.com/en/product/equities/NO0010196140-XOSL`) and shows the share price of Norwegian Air Shuttle from February 1, 2021 (when the survey was fielded) to October 2021. On May 27, 2021, the new shares issued started trading in the market and the share price plummeted. We have normalized the share price to 100 at February 1, 2021, corresponding to the start of our survey. The share price development shown in the figure includes the option value of the subscription right to buy 1.5 new shares for each existing share. For shareholders who did not exercise their subscription rights, the losses were even steeper than indicated in the figure.

Figure A.8: Screenshot of a Shareville account: Trading data



Note: This figure shows a screenshot of the wall of a Shareville account where all individual trades are listed.

Figure A.9: Experiment 3: Pre-treatment beliefs about the NAS stock



Note: This figure shows pre-treatment beliefs about by how much percent the share price of Norwegian Air Shuttle (NAS) will fall/rise over the next 12 months.

B Norwegian Air Shuttle: Institutional details

B.1 Background

Norwegian Air Shuttle (NAS) is a Norwegian low-cost airline founded in 1993. In the early 2000s, the company expanded outside of Norway, beginning with regional flights in Europe. The aggressive growth continued in the 2010s. As part of its growth plan, NAS also began offering transatlantic flights and flights between Europe and Asia. In 2017, the company became the largest airline in Scandinavia. In 2018, NAS international capacity was more than three times as large as it was in 2010, with over 30 million seats. The growth of NAS was primarily fueled by debt, and it was labeled "the world's most levered listed airline" by HSBC. After facing engine problems with their Boeing 787 Dreamliners and the grounding of their 737 Max planes, the airline industry was hit by the coronavirus pandemic, which exacerbated the company's debt issues.

In the summer of 2020 the shareholders supported a rescue plan that bundled a conversion of debt to equity with a new business strategy focusing more on profitable domestic flights. In late 2020, the company was refused a further loan from the Norwegian government, so both the Irish and Norwegian branch of the company sought bankruptcy protection. However, on January 14, 2021, the Norwegian government agreed to participate in a hybrid loan conditional on the company raising enough capital and receiving court approval for the rescue plan. The planned debt-for-equity swap would leave existing stock owners with around 5% of the company, while the companies leasing airplanes to NAS would become some of the largest shareholders. These converted debtholders would get 25% of the company according to this plan, while new investors would own the the remaining 70% of the company. The company expected to gain between 4,000 and 5,000 million NOK from the shares to new investors.[1] Before the dilution there were 42 million stocks. If existing shareholders would own 5% of the company, this means a total of around 800 million shares, of which 70 % would belong to new investors. Dividing the expected gains from the new shares by the number of new shares suggests a price of around NOK 7–9. In January 2021, the stock was traded on the Oslo Stock Exchange (OSE) for around NOK 60–70. The new stocks would be equivalent to previous equity, and current stockholders were given the option to buy 1.5

[1]The details of this plan is described in the following document: `https://www.norwegian.no/globalassets/ip/documents/about-us/company/investor-relations/stock-market-news/20210114-term-sheet-for-restructuring.pdf` (accessed January 26, 2023).

new shares for each existing share. This warrant was extended to anyone owning stocks on May 4. On March 26, NAS won Irish court approval for its restructuring, and on April 12, the plan was also approved by Norwegian authorities, under the condition of the company raising NOK 4.5 billion in fresh equity. As part of the plan, six cornerstone investors were given new shares, valued at around NOK 3 billion, for a price of NOK 6.26 per share, which was the same price the warrant offered to existing shareholders. By May 27, 2021, the new shares were traded in the market. The following days, at least two of the six cornerstone investors sold their shares.[2]

The development of the price of the NAS stock is shown in more detail in Figure A.7. This figure shows how the price dropped following the release of the new stocks in the market. The share price development shown in the figure includes the option value of the subscription right to buy 1.5 new shares for each existing share. For shareholders who did not exercise their subscription rights, the losses were even steeper than indicated in the figure.[3]

B.2 Ownership structure

NAS is a very popular stock among retail investors in the Nordic countries. NAS had 66,661 Norwegian owners at the end of 2020, which means that more than 12% of investors on the Oslo Stock Exchange (OSE) owned stocks in NAS. This makes NAS the second most popular stock in Norway measured by the number of investors (after Equinor).[4] Two-thirds of the stocks in NAS were owned by Norwegian investors at the end of 2020, and the number of Norwegian investors owning stocks in NAS had more than doubled over the past two years.[5] By the end of 2020, Nordnet customers owned around 13.5% of the stocks, while customers of Saxo Bank and Avanza owned 17%.[6]

In this time period there was a high turnover of the NAS stock, particularly among retail investors. In fact, in December 2020, the NAS stock was by far the most traded

[2] "Hjørnesteinsinvestorer med raske nedsalg i Norwegian", Asgeir Nilsen, *e24*, June 2, 2021.

[3] In total, around 7 million subscription rights were not exercised, leading to an estimated NOK 57 million in additional losses for retail investors who left money on the table by not exercising their subscription right (`https://e24.no/boers-og-finans/i/weaVBL/norwegian-aksjonaerer-gikk-glipp-av-millionverdier`; accessed January 26, 2023).

[4] `https://aksjenorge.no/aktuelt/2021/05/06/nas_emi/` (accessed January 26, 2023).

[5] "Nær to av tre Norwegian-aksjer eies nå av nordmenn og svensker", Roar Valderhaug. *e24*, January 12, 2021.

[6] "Småsparerne er størst i Norwegian", Asgeir Nilsen. *e24*, December 13, 2020.

stock on Nordnet, and more than 18% of the total stock turnover on the platform was due to retail investors buying and selling NAS stocks.[7] Across all types of investors, NAS was the fourth most traded stock on the OSE in this period, with a turnover of 1.4% of the total turnover. For comparison, at this point the market cap of NAS was approximately 0.1% of the value of the OSE.[8]

B.3 Evidence of shorting restrictions

According to data from the Norwegian Short Sale Register, there was no indication of unusually high shorting activity in the NAS stock in January 2021.[9] Jane Street Group LLC held the only significant shorting position, shorting 253,862 shares, equivalent to 0.63% of the total shares in the company. For comparison, over 20 stocks on the OSE have a higher rate of shorted shares. However, the NAS stock had high shorting rates of between 7% and 9% during 2019 and 2020, according to data from the Norwegian Short Sale Register.

To better understand the NAS stock's relatively low level of shorting during a period of a potential overpricing, we interviewed three of the largest brokerage firms in Norway in November 2021. We asked them whether they shorted the NAS stock during this time period. One of the firms answered that they had the opportunity to short sell because customers using a certain account type automatically allows the brokerage firm to short sell their stocks. However, due to stress testing regulations and the perceived volatility of the NAS stock, they did not use their opportunity for shorting during this time period.

The two other brokerage firms told us that the NAS stock owners were unwilling to lend their stocks for shorting.. This evidence is consistent with Barber and Odean (2007), who find that retail investors in general do not engage in much shorting. The authors also find that only 0.29% of positions of retail investors are short. We also contacted professional investors in Norway, and their general impression was also that short selling was practically infeasible due to the low number of stocks available for

[7] A Nordnet press release from January 5, 2021 shows the trading patterns. This press release is available from `https://nordnetab.com/sv/press_release/aktive-tradere-gar-banans-i-norwegian/` (accessed January 26, 2023)

[8] The trading data for the OSE are available at the following link: `https://live.euronext.com/resources/statistics` (accessed January 26, 2023)

[9] Data from the Norwegian Short Sale Register is available from Financial Supervisory Authority at `https://ssr.finanstilsynet.no/`. Only shorting positions larger than 0.5% of the stocks must be reported.

shorting. One investor argued that the very dispersed ownership structure of NAS made shorting particularly difficult, as a large fraction of shares were owned by investors owning just a few stocks.

C Institutional details about Norwegian fund investors

A 2022 report with data from the Norwegian Fund and Asset Management Association analyzes how Norwegian retail investors invest in funds and how they differ from institutional investors. The report documents that while institutional investors have almost half of their investments in index funds, retail investors have 76 percent of their investments in actively managed funds. The index share is increasing over time for both institutional and retail investors. In 2011, only 4 percent of retail investors' fund investments were in index funds.[10]

A 2022 report from Morningstar compares the fees and expenses paid by fund investors across different countries.[11] Norway is ranked as "above average" on their fees and expenses scorecard, which means that fund investors in Norway in general pay less in fees than in many other Western countries.

Morningstar also notes that there is a low exchange traded fund (ETF) usage in Norway and that banks are the primary channel for distribution of funds. There are almost two million customer relationships between Norwegian retail investors and banks.[12] The Morningstar report adds that the presence of online brokerage firms (such as Nordnet) allows investors to avoid paying high loads. Furthermore, Morningstar explains that several fund platforms have changed their fee structures by adding a platform fee which has resulted in relatively cheaper active funds. However, the active funds are still significantly more expensive than index funds. In 2021, Nordnet charged a platform fee for both index funds and active funds of 0.3 percentage points. When buying active funds, the customers additionally need to pay fees to the fund provider,

[10]This report is available through `https://www.nrk.no/norge/norske-husholdninger-sparer-i-de-dyreste-fondene_-_-jeg-blir-litt-sjokkert-1.15958198` (accessed January 26, 2023).

[11]This report is called *Global Investor Experience Study: Fees and Expenses* and available through the following link: `https://www.morningstar.com/lp/global-fund-investor-experience` (accessed January 26, 2023)

[12]Detailed statistics about how Norwegians save in different types of funds (such as technology funds and regional funds) from banks are available on the website of VFF or through `https://vff.no/about-the-norwegian-fund-and-asset-management-association`

while Nordnet offers index funds that are free except for the platform fee. Nordnet offers more than 800 mutual funds from around the world, and also offers investment opportunities in ETFs.[13]

Compared to the neighboring countries, Norwegians invest less in stocks and mutual funds. While Swedes and Danes on average invest more than USD 20,000 in listed stocks and mutual funds, Norwegians have invested around USD 6,000 in listed stocks and mutual funds.[14]

[13] A complete list of mutual funds (not including ETFs) offered by Nordnet is available through the following link: `https://www.nordnet.no/market/funds?sortField=yield_1y&sortOrder=descending`

[14] These numbers are collected from a report from Statistics Norway that is available through the following link: `https://www.ssb.no/nasjonalregnskap-og-konjunkturer/artikler-og-publikasjoner/_attachment/380156?_ts=16958558ee0`

D Experiment 1: English translations of experimental instructions

D.1 Invitation sent out on the trading platform

Do you want to participate in a survey about your investing habits? It is very short and takes less than 3 minutes!

As a thank you for your participation, you will join a lottery for 10 gift cards of 500 NOK to a website of your choice.

Follow this link to participate in the survey: `investorsurvey.no` (you cannot click or copy the link in the Shareville app, so you have to enter the address directly in your web browser).

The survey is conducted by researchers from the NHH Norwegian School of Economics and the University of Bergen. Questions can be directed to Ole-Andreas.Naess@snf.no and Ingar.Haaland@uib.no or by replying to this message.

We hope that you want to participate!

Best regards,

Ole-Andreas Elvik Næss and Ingar Haaland

D.2 Introductory screen

Thank you for participating in this short survey about your investment habits. **The survey takes less than 3 minutes to complete.**

The survey is conducted by researchers from the NHH Norwegian School of Economics and the University of Bergen. Questions can be directed to Ole-Andreas.Naess@snf.no and Ingar.Haaland@uib.no.

10 participants will receive a 500 NOK gift card to a website of your choice. We will send you a message on Shareville if you win a gift card. We therefore need to know your username.

What is your username on Shareville?

D.3 Pre-treatment outcomes

An equity fund contains many different stock companies. The most common equity funds are global funds, which contain stock companies from around the world.

It is common to make a distinction between active funds and index funds. Active funds try to give a better return than the stock market, while index funds try to copy the market.

If we consider funds offered by Norwegian banks over the last 20 years, do you think active funds have given higher or lower returns than index funds (after fees)?

Active funds have given the highest returns.

Active funds and index funds have given about equal returns.

Index funds have given the highest returns.

If we consider global active funds offered by Norwegian banks over the last 10 years, which claim do you think is most accurate for funds that gave **higher** returns than average in the first half of the decade?

They also gave higher returns than average in the second half of the decade.

They gave average returns in the second half of the decade.

They gave below-average returns in the second half of the decade.

D.4 Information treatment

The Norwegian Consumer Council published a survey last year in which they compared the returns on global active funds and index funds offered by Norwegian banks over the last 20 years.

They found that **active funds on average gave a 1.1 percentage point lower yearly return than index funds**. According to the Consumer Council, you can expect to lose NOK 370,000 over 20 years if you choose to invest NOK 500,000 in an active fund instead of an index fund.

The Consumer Council also found that it is not possible to predict the returns of a fund over time: **Active funds with a good performance in the first half of the period did neither better nor worse than other funds in the second half of the period.**

D.5 Post-treatment outcomes

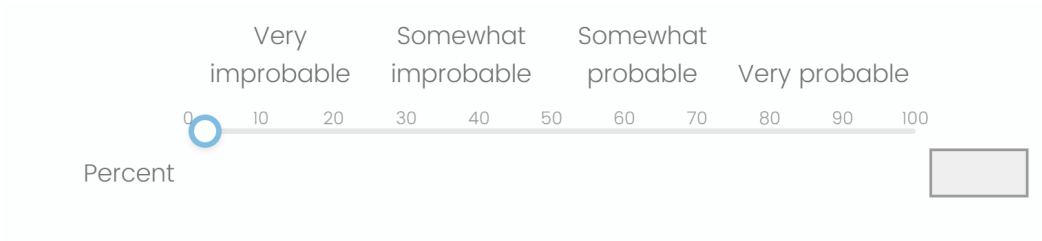
Do you think active funds or index funds will give the highest returns going forward (after fees)?

Active funds will give higher returns than index funds.

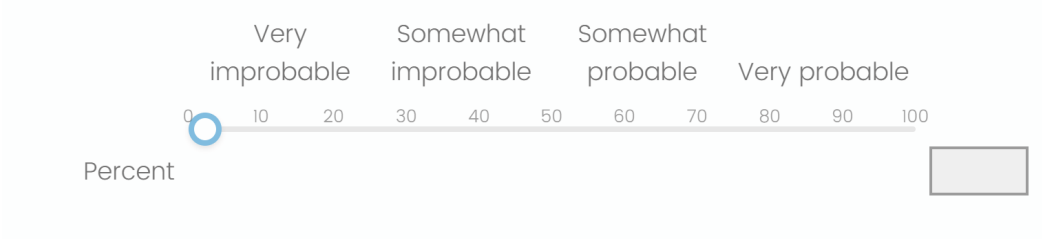
Active funds and index funds will give about equal returns.

Index funds will give higher returns than active funds.

What is the probability that over time you will find active funds that will give better returns than comparable index funds (after fees)?



What is the probability that over time you will be able beat the market by investing in individual stocks?



How do you plan to structure your equity portfolio between active funds, index funds, and individual stocks going forward?

Active funds	☐ %
Index funds	☐ %
Individual stocks	☐ %
Total	☐ %

D.6 Feedback on the survey

Do you have any comments before we end the survey?

E Experiment 2: Translations of additional questions included in this survey

E.1 Financial literacy

Suppose you had 1,000 NOK in a savings account with an interest of 20% and that you never add or withdraw money from the account. After 5 years, how much money will you have on the account?

More than 2,000 NOK

Exactly 2,000 NOK

Less than 2,000 NOK

Do not know

Which of the following statements is correct? If somebody buys the stock of firm B in the stock market, then...

He owns a part of firm B.

He has lent money to firm B.

He is liable for firm B's debts.

None of the above statements are correct.

Do not know.

E.2 Overconfidence

What percentage of Norwegians who participate in the stock market do you think are better than you (e.g., in the way they interpret information and general knowledge) at identifying equity funds and stocks that will outperform the market in the future?

E.3 Informational sources

Which sources of information are important for you when choosing an equity fund? Choose all that apply.

Advice from the bank

Discussions with friends and acquaintances

Finance news

Fund reports

Experts in the media

Statistics on historical returns

Social media

None of the above

F Experiment 3: English translations of experimental instructions

F.1 Introductory screen

Thank you participating in this short survey about your investment habits. **The survey takes less than 5 minutes to complete.**

The survey is conducted by researchers from the NHH Norwegian School of Economics and the University of Bergen. Questions can be directed to Ole-Andreas.Naess@snf.no and Ingar.Haaland@uib.no.

10 participants will receive a 500 NOK gift card to a website of their choice or a $100 Amazon gift card. We will send you a message on Shareville if you win a gift card. We therefore need to know your username.

What is your username on Shareville?

F.2 Pre-treatment outcomes

Do you own stocks in Norwegian Air Shuttle (NAS?)

Yes

No

Do you think the **main index of the Oslo Stock Exchange (OSEBX)** will rise or fall over the next 12 months?

Rise

Fall

Do you think the **share price of Norwegian Air Shuttle (NAS)** will rise or fall over the next 12 months?

Rise

Fall

By how many percent do you think the **main index of the Oslo Stock Exchange (OSEBX)** will rise over the next 12 months?[15]

☐ %

By how many percent do you think the **share price of Norwegian Air Shuttle (NAS)** will rise over the next 12 months?

☐ %

F.3 Treatment screen

Super fund manager Robert Næss in Nordea has spoken about Norwegian Air Shuttle (NAS) in the media several times. In the clip below, he summarizes his thoughts on the stock in 60 seconds. The survey continues when the video is completed. **Remember to turn the sound on**.[16]

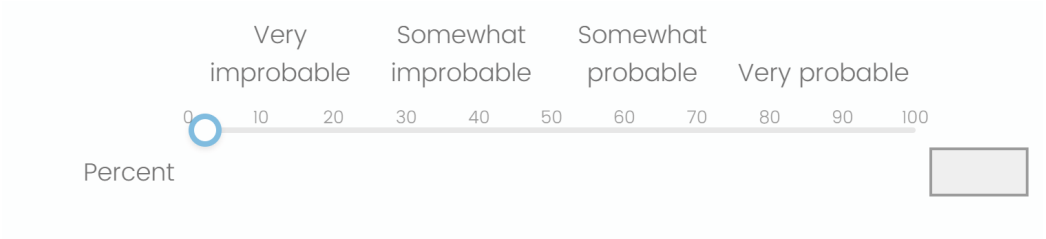
[15] Respondents who said "Fall" are instead asked how many percent they think index/price will fall over the next 12 months

[16] Treated respondents viewed the YouTube video embedded in the survey. The video is available at `https://youtu.be/thf-9BWFd0g`. The translated script from the YouTube video reads as follows:

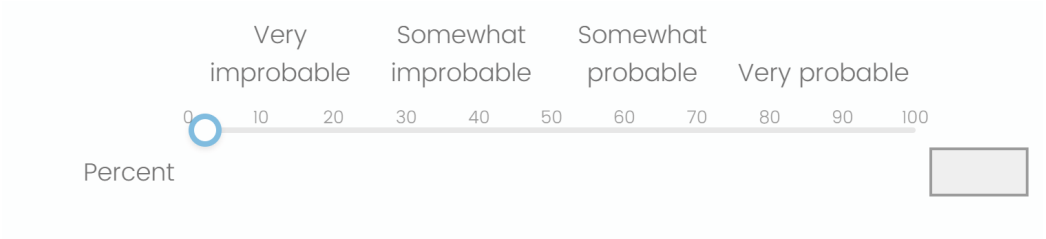
> Hi, my name is Robert Næss and I am an Investment Director at Nordea Investment Management.
>
> Some of you have probably seen that I have made comments about the Norwegian stock in the media. And the reason I have been making these comments is that the pricing of Norwegian is very strange.
>
> Normally when it comes to stocks, some can be expensive, while others can be cheap. Experts such as myself might comment and say that a stock is too expensive, and then it becomes just more and more expensive. Or we can say that a stock is cheap, and then it just falls.
>
> But what is special about Norwegian is that we know one thing for sure. We know that in a few weeks, or maybe in a few months, a huge amount of stocks will be sold for less than 7 NOK. And that means that if the share price is now 60 NOK, then it is guaranteed that the share price will be significantly lower in a few months. The share price will probably be less than 7 NOK. Maybe 8 NOK if you are lucky, or maybe 9 NOK.
>
> So here one thing is for sure. Which is that those who buy or own stocks in Norwegian valued at around 60 NOK are guaranteed to lose money. A lot of money. So here I have some simple advice, which is that you should sell the stock. You can join the equity raising later if you want. But you should definitely sell the stocks you own now.

F.4 Post-treatment outcomes

What is the probability that you will have Norwegian Air Shuttle (NAS) in your Shareville portfolio in one week?



What do you think is the probability that the share price of Norwegian Air Shuttle (NAS) **will fall by more than 50%** over the next 12 months?



G Experiment 4: Translations of additional questions included in this survey

G.1 Pre-treatment questions

How often do you read financial news?

Never

Rarely

Sometimes

Often

During the last 30 days, how much have you read about Norwegian Air Shuttle (NAS) in the media?

Nothing

A little

A great deal

A lot

How much knowledge do you have about mutual funds and stocks?

I know nothing about mutual funds and stocks.

I know a little bit about mutual funds and stocks.

I know a great deal about mutual funds and stocks.

I know a lot about mutual funds and stocks.

Do you own stocks in Norwegian Air Shuttle?[17]

[17]This question was also included in Experiment 3.

Yes

NoD

Do you own stocks in any other companies on the Oslo Stock Exchange?

Yes

No

Do you own shares in a mutual fund?

Yes

No

H Screenshots: Experiment 1 (Shareville)

H.1 Invitation sent out on the trading platform

Ole-Andreas

15:12

Vil du delta i en undersøkelse om dine investeringsvaner? Den er veldig kort og tar under 3 minutter!

Som en takk for din deltakelse, er du med i trekningen av 10 gavekort på 500 kr til en valgfri nettbutikk.

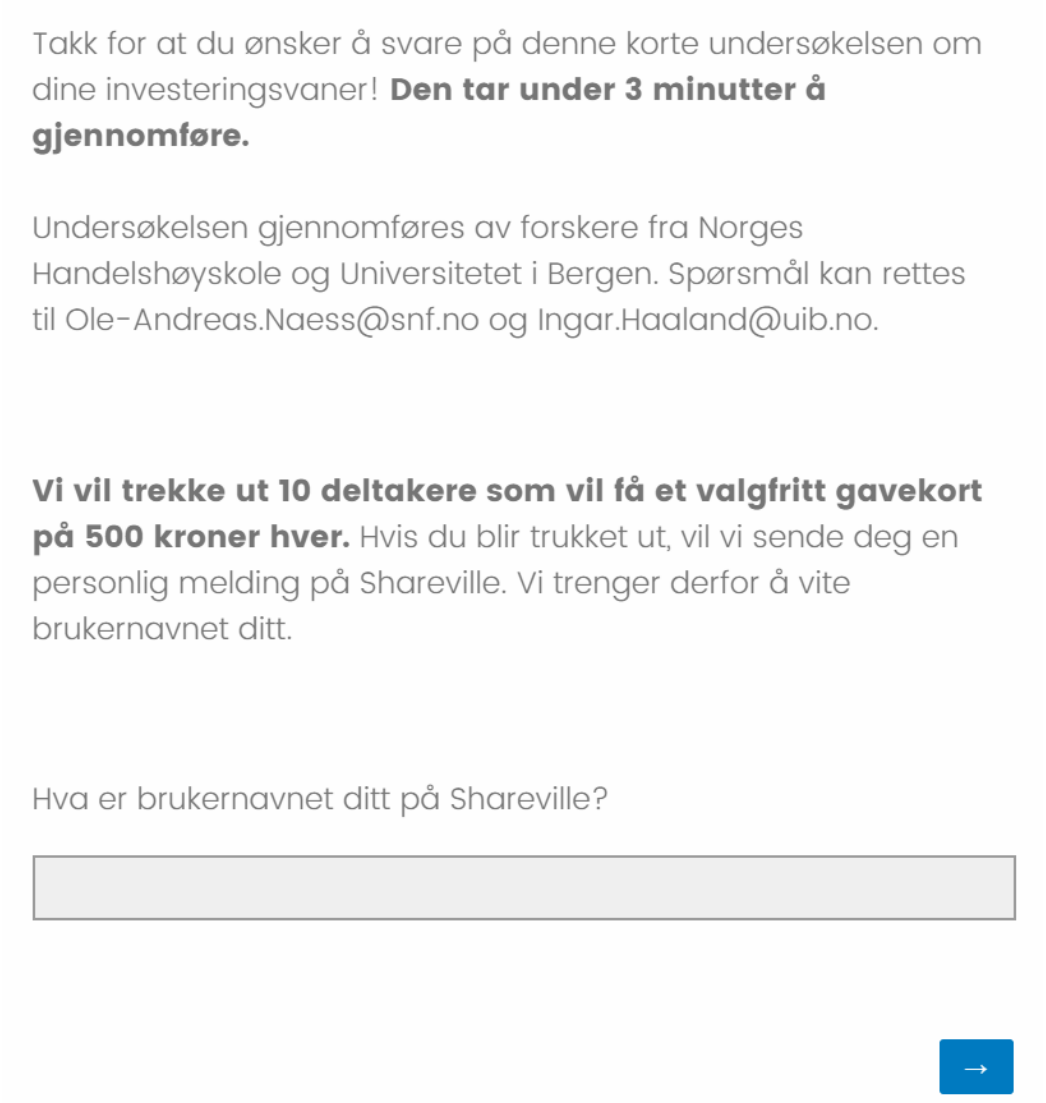
For å delta kan du følge denne lenken: www.investorsurvey.no
(I Shareville-appen kan du ikke trykke på eller kopiere lenken, så da må du skrive inn adressen i nettleseren din)

Undersøkelsen gjennomføres av forskere fra Norges Handelshøyskole og Universitetet i Bergen. Spørsmål kan rettes til Ole-Andreas.Naess@snf.no og Ingar.Haaland@uib.no eller ved å svare på denne meldingen.

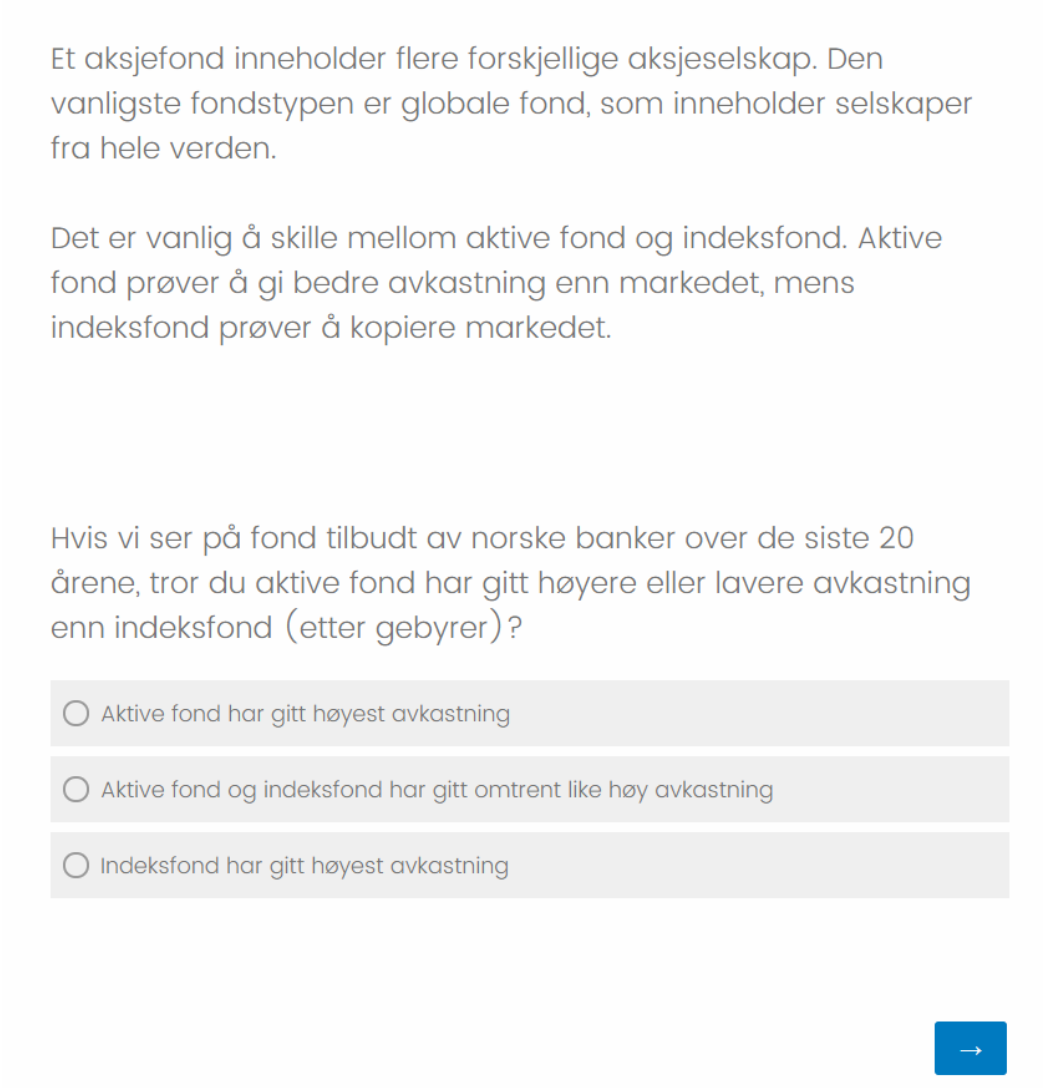
Vi håper at du vil delta!

Med vennlig hilsen Ole-Andreas Elvik Næss og Ingar Haaland

H.2 Introductory screen



H.3 Pre-treatment beliefs



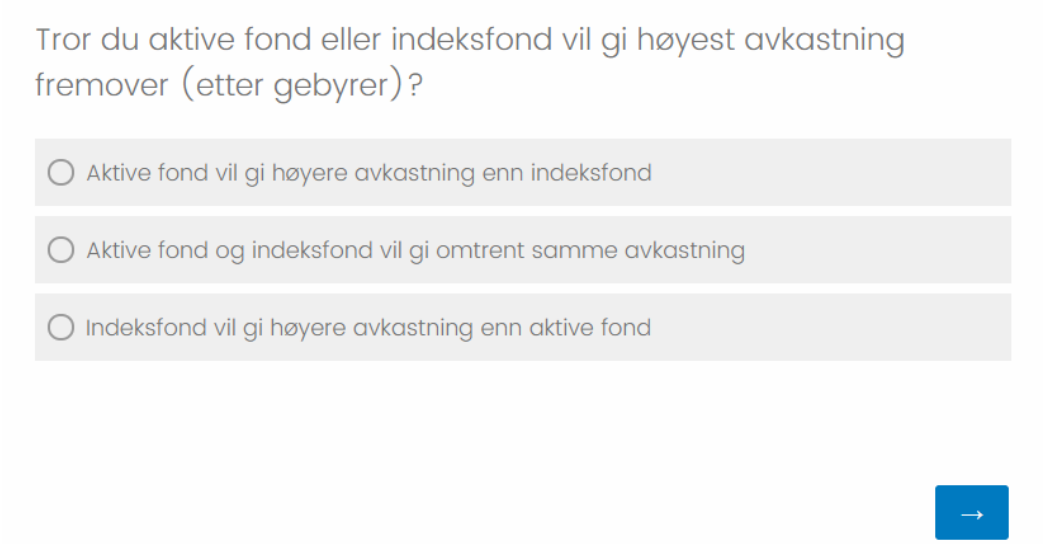
Hvis vi ser på alle globale aktive fond tilbudt av norske banker de siste ti årene, hvilken påstand tror du stemmer best for fond som ga **høyere** avkastning enn gjennomsnittet i første halvdel av tiåret?

- ◯ De hadde også høyere avkastning enn gjennomsnittet andre halvdel av tiåret
- ◯ De hadde omtrent gjennomsnittlig avkastning andre halvdel av tiåret
- ◯ De hadde lavere avkastning enn gjennomsnittet andre halvdel av tiåret

→

H.4 Treatment screen

H.5 Post-treatment outcomes



Hva er sannsynligheten for at du over tid vil greie å slå markedet ved å investere i enkeltaksjer?

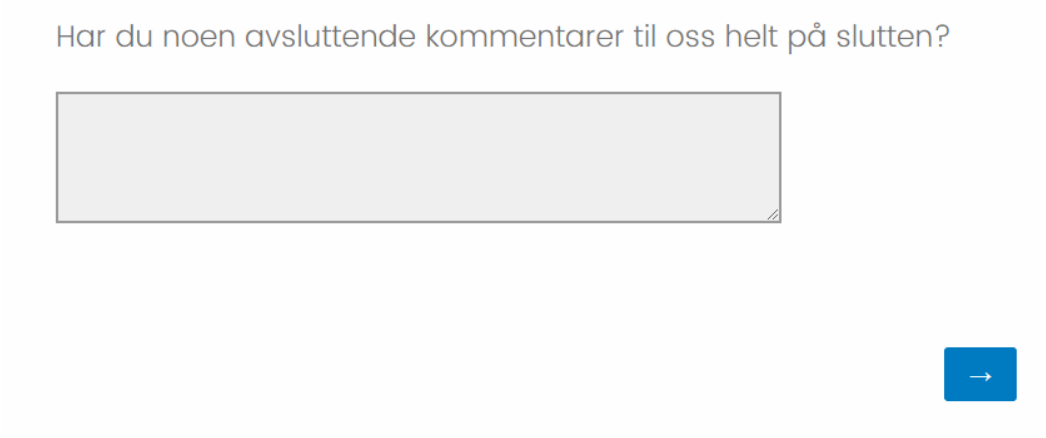
→

Hvordan vil du disponere aksjeporteføljen din mellom aktive fond, indeksfond og enkeltaksjer fremover?

Aktive fond	0 %
Indeksfond	0 %
Enkeltaksjer	0 %
Total	0 %

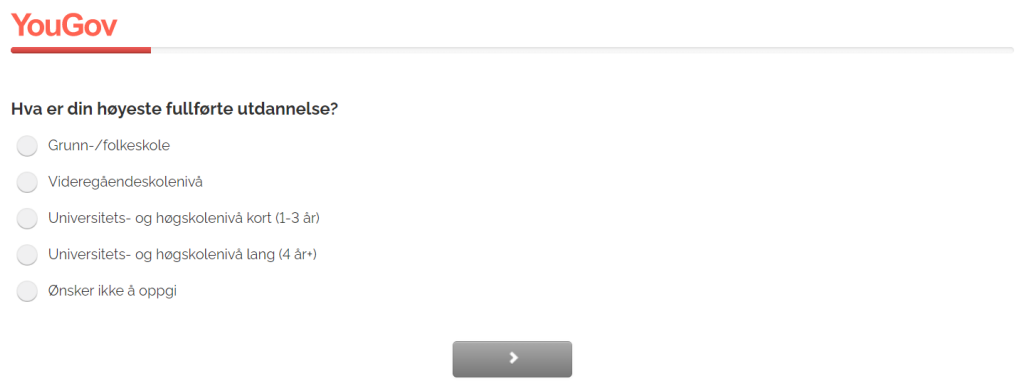
→

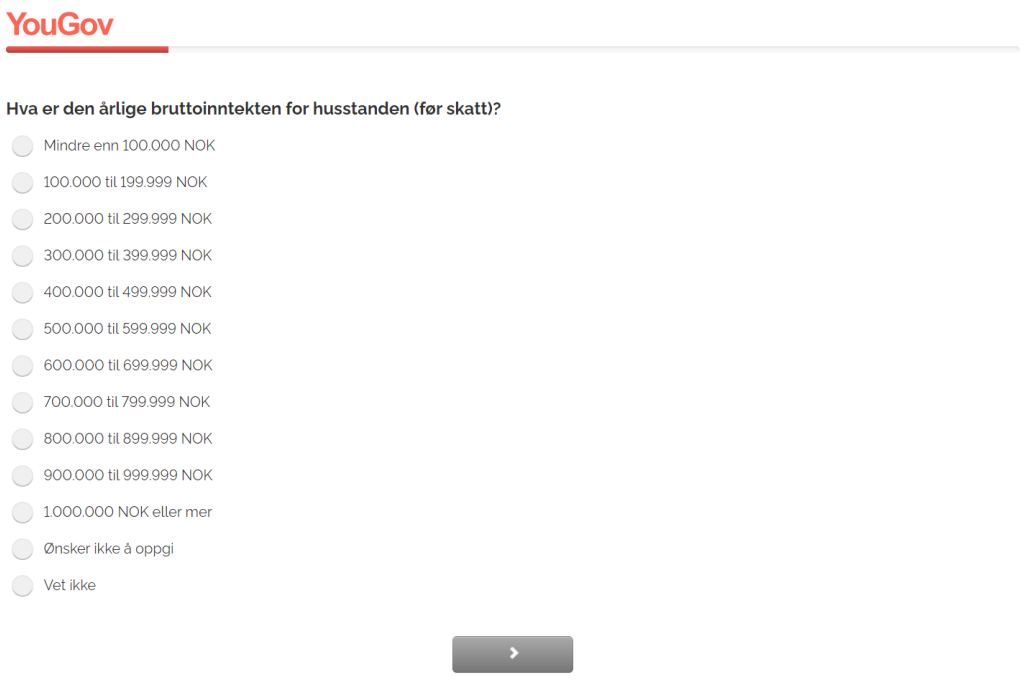
H.6 Feedback on the survey



I Screenshots: Experiment 2 (YouGov)

I.1 Demographics





YouGov

Hvilket av disse utsagnene beskriver best din nåværende familiesituasjon?

- Jeg bor sammen med mine foreldre (eller en av dem)
- Jeg er singel/enslig/ikke samboer og har barn som bor hjemme
- Jeg er singel/enslig/ikke samboer og har ingen barn som bor hjemme
- Jeg er samboer/gift og vi har barn som bor hjemme
- Jeg er samboer/gift uten barn som bor hjemme
- Annen bosituasjon og har barn som bor hjemme
- Annen bosituasjon og har ikke barn som bor hjemme

YouGov

Hva er din hovedbeskjeftigelse? Dersom du for tiden er i fødselspermisjon eller er sykemeldt, velger du med tanke på tiden før permisjonen/sykemeldingen.

- Ikke yrkesaktiv - pensjonert
- Ikke yrkesaktiv - arbeidsledig, langtidssykemeldt, trygdet, i praksis via NAV
- Hjemmeværende
- Student/lærling/elev
- Yrkesaktiv - kontorjobb, undervisning m.m
- Yrkesaktiv - fagarbeider, handels- og serviceansatt, helsearbeider m.m
- Selvstendig næringsdrivende
- Annet

YouGov

Hvilket av de følgende alternativ passer best på den byen/det området du er bosatt i?

- Hovedstadsområdet
- I by med 50.000 innbyggere eller flere
- I by/tettsted med 5.000 til 49.999 innbyggere
- Landlige områder eller by med mindre enn 5.000 innbyggere
- Vet ikke

YouGov

Hvilket av følgende alternativer beskriver din nåværende situasjon best?

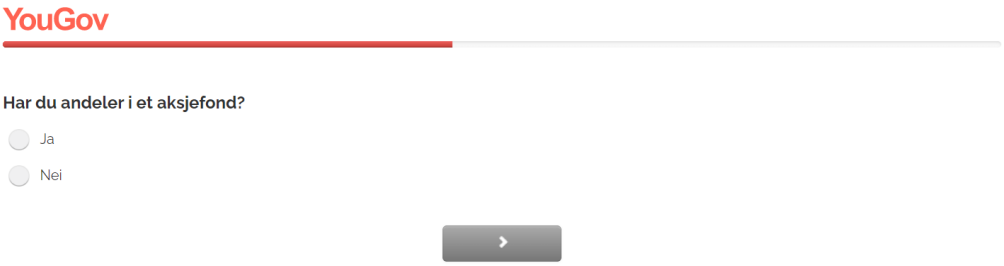
- Gift
- Registrert partnerskap
- Separert
- Samboer
- I et forhold, men bor ikke sammen
- Enslig
- Skilt
- Enke/enkemann

YouGov

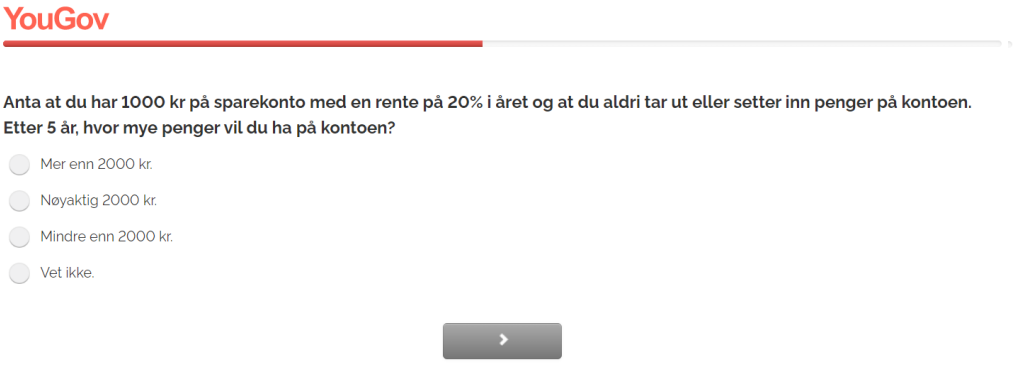
Hvilke, om noen, av disse sosiale nettsamfunnene deltar du i? Vennligst kryss av for alle det gjelder. Med "delta i", mener vi at du er registrert og logger deg inn gjennomsnittlig minst en gang i måneden eller mer.

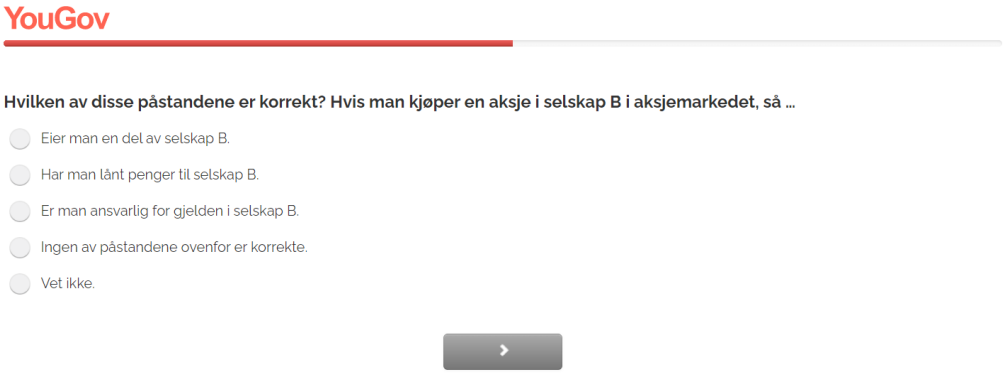
- TikTok
- Reddit
- Facebook
- LinkedIn
- YouTube
- Twitter
- BeReal
- Snapchat
- Tumblr
- Pinterest
- Instagram
- Annet
- Vet ikke
- Ingen av disse

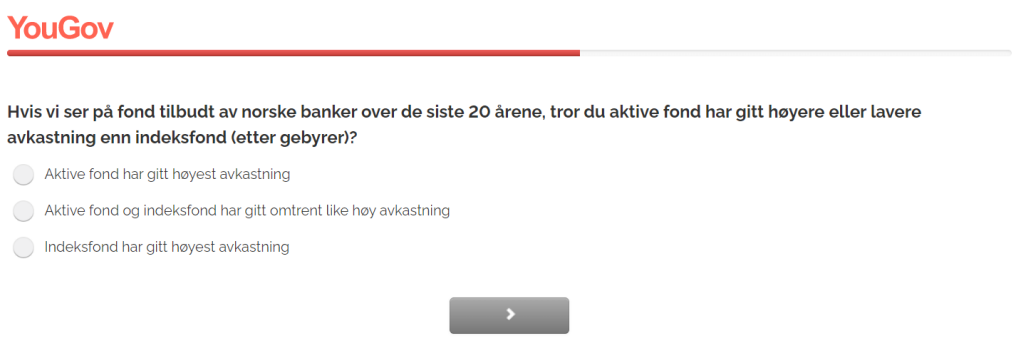
I.2 Screener question

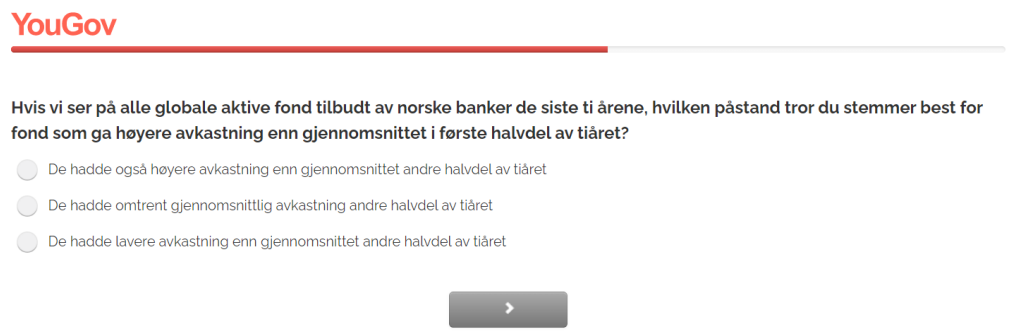


I.3 Pre-treatment questions

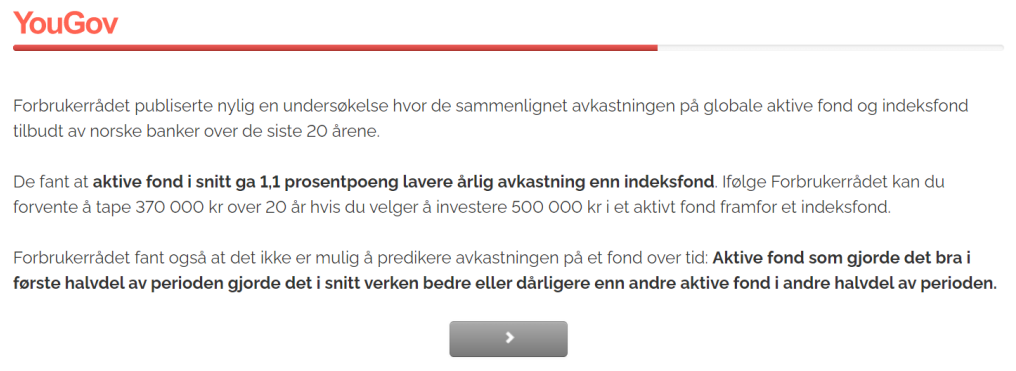




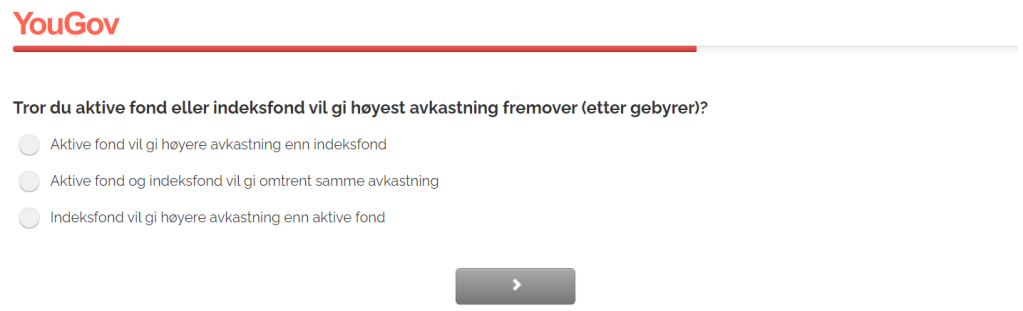


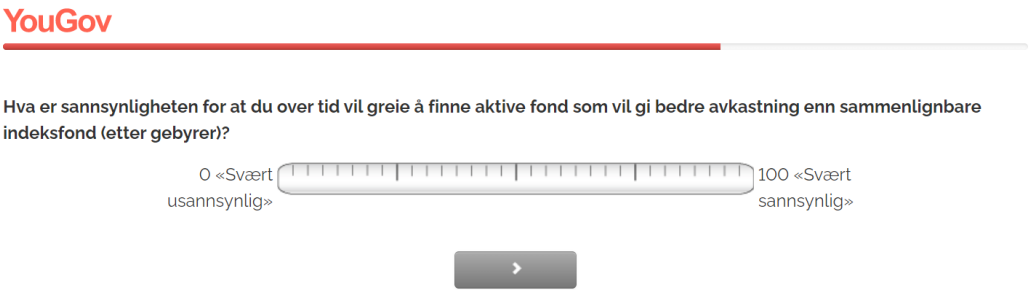


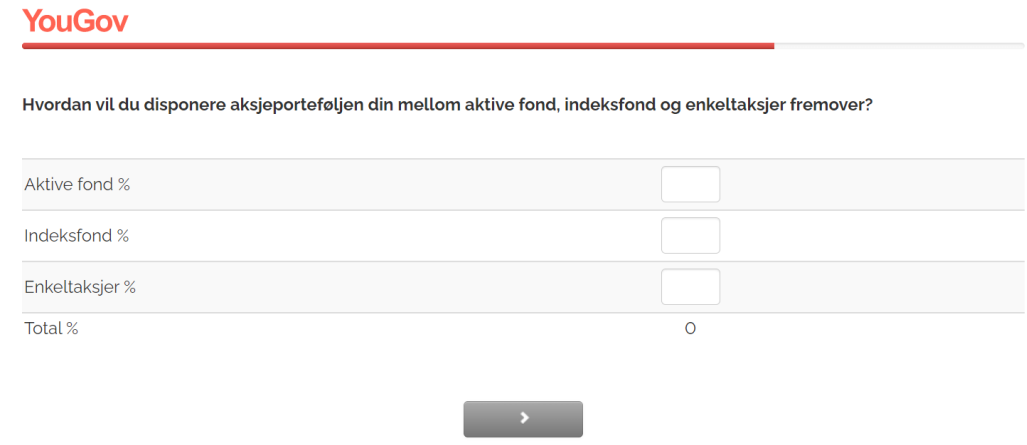
I.4 Treatment screen



I.5 Post-treatment questions







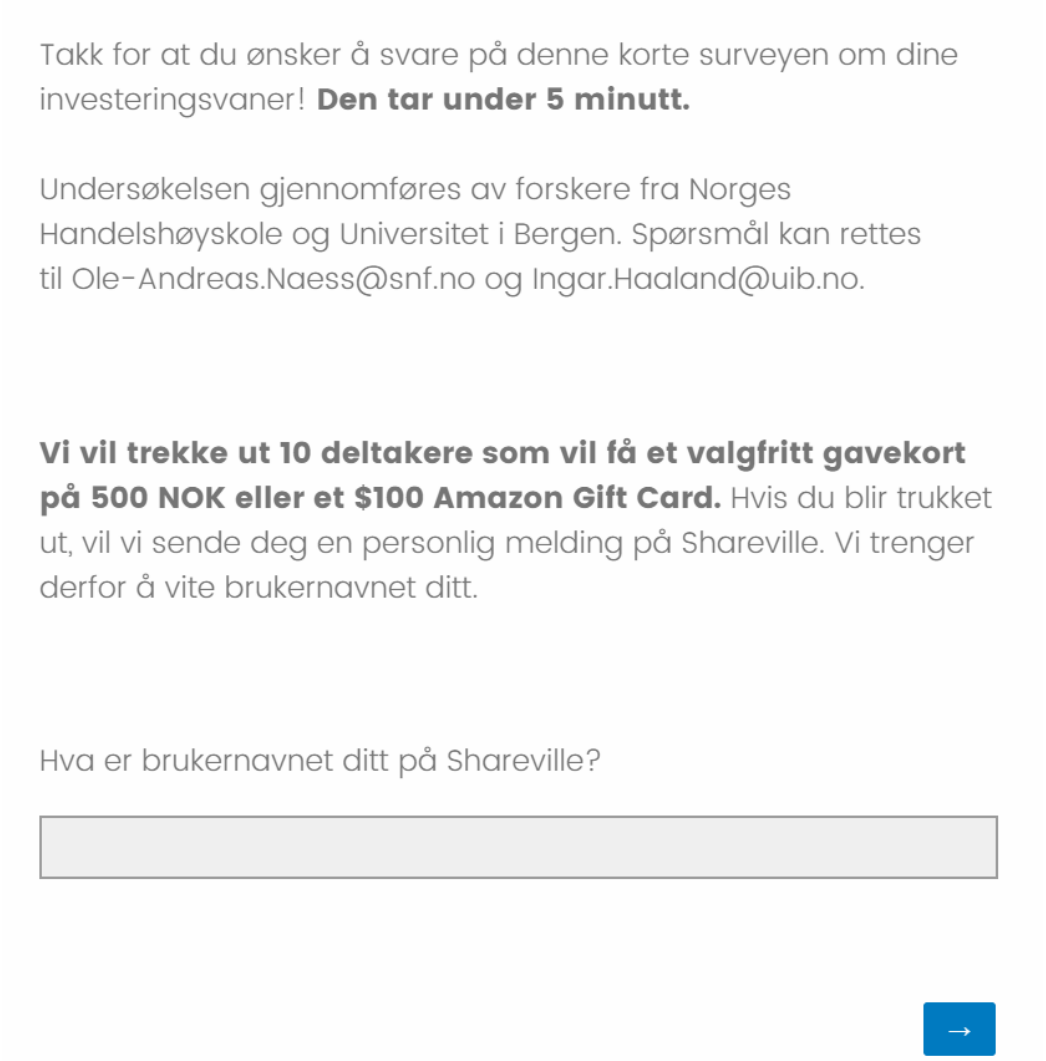
YouGov

Hvilke kilder til informasjon er viktige for deg når du skal velge aksjefond? Velg alle svaralternativer som passer.

- [ ] Råd fra banken
- [ ] Diskusjoner med venner og bekjente
- [ ] Finansnyheter
- [ ] Fondsrapporter
- [ ] Eksperter i media
- [ ] Statistikk på historisk avkastning
- [ ] Sosiale medier
- [ ] Ingen av de over

J Screenshots: Experiment 3 (Shareville)

J.1 Pre-treatment questions



Har du aksjer i Norwegian Air Shuttle (NAS)?

- ◯ Ja
- ◯ Nei

→

Tror du **hovedindeksen på Oslo Børs (OSEBX)** vil stige eller synke i løpet av de neste 12 månedene?

- ◯ Stige
- ◯ Synke

Tror du **aksjekursen i Norwegian Air Shuttle (NAS)** vil stige eller synke i løpet av de neste 12 månedene?

- ◯ Stige
- ◯ Synke

→

Hvor mange prosent tror **hovedindeksen på Oslo Børs (OSEBX)** vil stige over de neste 12 månedene?

%

Hvor mange prosent tror du **aksjekursen i Norwegian Air Shuttle (NAS)** vil stige over de neste 12 månedene?

%

→

J.2 Treatment screen

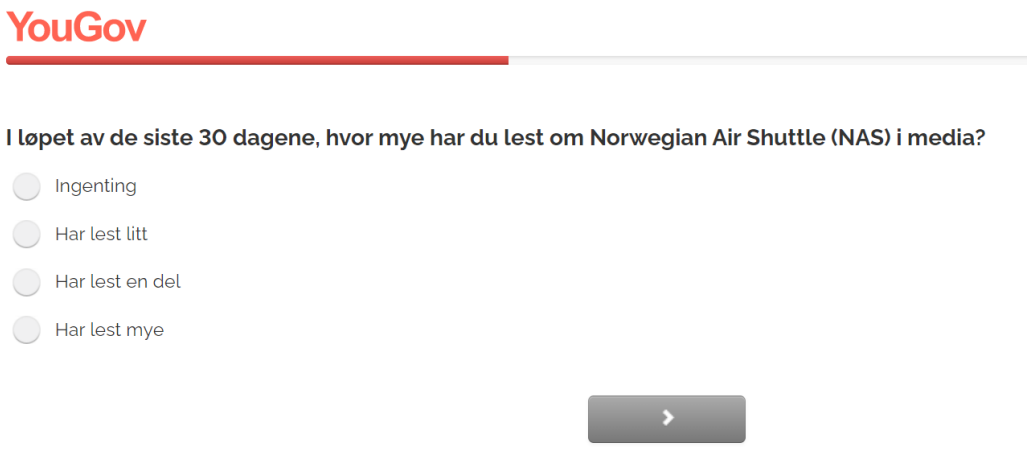
Superforvalter Robert Næss i Nordea har flere ganger uttalt seg om Norwegian Air Shuttle (NAS) i media. I filmen under oppsummerer han på 60 sekunder sine tanker om aksjen. Undersøkelsen fortsetter når videoen er ferdigspilt. **Husk å slå på lyd**.

J.3 Post-treatment questions

K Screenshots: Experiment 4 (YouGov)

K.1 Pre-treatment questions

Note: Respondents in this experiment were also asked the same demographic questions as in Experiment 2 with YouGov. Screenshots of the demographic questions are included in Section I.1.



YouGov

Hvor mye kan du om fond og aksjer?

- Jeg kan ingenting om fond og aksjer
- Jeg kan litt om fond og aksjer
- Jeg kan en del om fond og aksjer
- Jeg kan mye om fond og aksjer

YouGov

Har du aksjer i Norwegian Air Shuttle (NAS)?

- Ja
- Nei

YouGov

Har du enkeltaksjer i noen andre selskaper på Oslo Børs?

- Ja
- Nei

YouGov

Har du andeler i et aksjefond?

- Ja
- Nei

YouGov

Tror du hovedindeksen på Oslo Børs (OSEBX) vil stige eller synke i løpet av de neste 12 månedene?

- Stige
- Synke

YouGov

Tror du aksjekursen i Norwegian Air Shuttle (NAS) vil stige eller synke i løpet av de neste 12 månedene?

- Stige
- Synke

YouGov

Hvor mange prosent tror du hovedindeksen på Oslo Børs (OSEBX) vil stige over de neste 12 månedene?

%

YouGov

Hvor mange prosent tror du aksjekursen i Norwegian Air Shuttle (NAS) vil stige over de neste 12 månedene?

%

K.2 Treatment screen

YouGov

Superforvalter Robert Næss i Nordea har flere ganger uttalt seg om Norwegian Air Shuttle (NAS) i media. I filmen under oppsummerer han på 60 sekunder sine tanker om aksjen. Undersøkelsen fortsetter når videoen er ferdigspilt. **Husk å slå på lyd.**

K.3 Post-treatment questions

YouGov

Hva er sannsynligheten for at du kommer til å selge aksjer i Norwegian Air Shuttle (NAS) innen en uke? Beveg markøren til du finner den sannsynligheten som passer for deg

YouGov

Hva mener du er sannsynligheten for at aksjekursen i Norwegian Air Shuttle (NAS) vil falle mer enn 50% over de neste tolv månedene?