Investing with Brain or Heart?

A Field Experiment on Responsible Investment

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Abstract

Socially responsible investments (SRI) have emerged as a prominent trend in financial markets, and are characterized by the integration of both financial and non-financial objectives. The purpose of this paper is to investigate whether financial or non-financial information is most significant in individual investors' decision making about SRI. We investigate this in a unique field experiment of investors in an online banking context. We find that investors who received financially framed information were significantly more inclined to search for further information and buy SRI mutual funds than investors who receive non-financially framed information. Moreover, we find that the effectiveness of financial information increases with the financial sophistication of the investor. The study contributes to the literature by providing insight into pro-social decision making in financial markets.

Key words

Field experiment, household finance, investor behavior, socially responsible investment

1. Introduction

Socially responsible investments (SRI) have emerged as a prominent trend in financial markets (see e.g. Hong and Kostovetsky, 2012; Barber, 2007; Renneboog et al., 2008; Sparkes, 2002). As an investment product, SRI has a dual nature. On the one hand, it is designed to yield the highest possible risk-adjusted financial return. On the other hand, however, SRI investments also take into account social, ethical and/or environmental concerns (Derwall et al., 2011; Sandberg et al., 2009). This implies that the investment integrates both financial and non-financial objectives; thus the investment may appeal both to investors' brains and hearts.

For the distributors of financial products, this duality presents a challenge. How can one design responsible investment products that are in line with customers' desires and market them effectively? The practical concerns of a Norwegian bank manager were in fact the starting point for the present study. The manager realized that while its customers expressed interest in SRI, the bank did not properly understand the customers' motivations, which made it difficult for them to design and distribute the investment product. In order to investigate what drives investment in SRI, we conducted a field experiment during the bank's introduction of a classification scheme for mutual funds.[1] The findings of our field experiment offer insight into the initial managerial problem: *what do investors really want?*

The purpose of this paper, then, is to investigate whether financial and non-financial information is most significant in individual investors' decision making related to SRI. The distinction between financial and non-financial information refers to the various types of information individual investors may use for decision making purposes, e.g. information or predictions about financial performance on the one hand and similar information or predictions about social and environmental performance on the other hand.

Consider the following analogy.[2] When you are faced by the decision of whether or not to purchase an environmentally friendly hybrid car, the decision can be framed in (at least) two ways. For instance, the decision can be framed as a financial one, and thereby highlight economically relevant

[1] Conducting field experiments in collaboration with businesses is an approach described as "particularly attractive" for future research, by Levitt and List (2009, p. 15), who moreover add: "We envision that rapid growth will occur in this area, both as firms realize how field experiments can help their business, and as academics determine how to effectively foster productive win-win relationships with firms."

[2] This example is also discussed by Ariely et al. (2009) in order to distinguish between intrinsic and extrinsic incentives for prosocial behavior.

dimensions of the decision, e.g. that the hybrid car has a better fuel economy than a conventional car, that the hybrid electric car qualifies for an income tax credit, that hybrid cars have free parking and so on.[3] Alternatively, the decision can be framed as primarily an environmental (i.e. non-financial) issue, e.g. that owners of hybrid cars contribute less to global warming, that electrical cars use renewable materials and energy, and so on. It follows from this that providing potential buyers with either financial or environmental information may lead them to consider the decision as being primarily either a financial or an environmental one. Hence, by providing different groups of consumers with different information, subsequent decision making may be influenced. This opens a potential avenue for experimental investigation.

The question of whether financial or non-financial information is most significant in individual investors' decision making about SRI can be answered by measuring differences in investment behavior following the framing of the SRI decision as either financial or non-financial. The effectiveness of the two types of information may serve as a measure of the relative strength of investors' objectives. For example, if 10 % of the randomized group of customers that receive the financial information treatment trade in SRI mutual funds, and only 5 % of the group that receive the non-financial information treatment trade in SRI mutual funds, it should be interpreted as if financial benefits are twice as important than non-financial benefits.[4]

In our paper, we investigate the question in a field experiment of investors in an online banking context. In conducting our field experiment, we were allowed to "take over" the Norwegian bank *Skandiabanken*. The context was the bank's implementation of a responsibility classification scheme for investments[5], which allowed us to investigate investor behavior during their first introduction to the concept of SRI in the bank's investment setting. In order to investigate the effectiveness of financial and non-financial information, respectively, we randomly assigned 140 000 bank customers into two experimental groups. We e-mailed newsletters with differently framed information about SRI to each of the groups. This made it possible for us to investigate two steps in the investors' decision making process – (1) information search (measured by the number of clicks from the newsletter to a web site with additional information about SRI), and (2) investment behavior

[3] The benefits for hybrid car owners vary across different regulatory regimes.
[4] In a similarly designed field experiment on labor force participation, Liebman and Luttmer (2011) find that by providing one randomized group with relevant information about social security, the labor force participation of this group increased by 4 % relative to the control group. However, in our design, randomized groups receive two different types of information, and we measure the relative strength of the information sources.
[5] The details of the classification scheme are outlined in the methodology section.

(measured by changes in the investors' mutual fund portfolio). If the two frames lead to different investment behavior, this will reflect differences in the effectiveness of the two types of information.

Our findings show that investors who received financially framed information are more likely to (1) search for further information and (2) invest responsibly than investors with a non-financial decision frame. This is contrary to prior studies that have indicated the opposite (Glac, 2009; Barreda-Tarrazona et al., 2011). We will argue that the difference in results follows from the shortcomings of prior studies. Our findings indicate that there is a difference between what investors say they want and what they actually do with their savings.

While our findings are in line with financial decision theory, we suggest a behavioral explanation that emphasizes the investor's need for uncertainty reduction by means of "financial proof". Moreover, we find that the effectiveness of financial information increases with the financial sophistication of the investor. Thus, we also contribute to the literature by providing insight into actual pro-social behavior in financial markets, which is valuable due to the economic and societal significance of those markets (cf. Hong and Kacperczyk, 2009). Moreover, understanding individual behavior in financial markets is valuable for understanding behavior in other markets that increasingly take on the characteristics of financial markets, e.g. online retailing, which is characterized by anonymity of actors (cf. Levitt and List, 2007).

The paper is structured as follows. First, we account for our experimental design. Second, we develop our hypotheses. Third, we present our results. Finally, we draw conclusions and outline implications.

2. Experimental design

In this section, we account for our experimental design. First, we justify the selection of the experimental design in general and the field experiment in particular. Second, we outline the details of the field experiment design, and how it was conducted in practice.

2.1. The natural field experiment

The purpose of our paper is to reveal whether financial or non-financial information is most significant in individual investors' decision making about SRI. Ideally, such empirical investigation should be conducted in the actual investment context, without losing control over the research

setting. In order to obtain this objective, we carried out a field experiment in the Norwegian bank *Skandiabanken* – an internet bank with several hundred thousand customers and an easily accessible internet solution for distribution of mutual funds. Recently, economists have increasingly made use of field experiments to explore economic phenomena (see e.g. Harrison and List, 2004; Levitt and List, 2007; Alevy et al., 1997). Our experiment is a *natural field experiment*, since the environment is one where the subjects naturally undertake the studied behavior and where the subjects do not know that they are in an experiment (Harrison and List, 2004).

There is a considerable literature that demonstrates differences between behavior in lab experiments and field experiments (see e.g. List, 2006; Levitt and List, 2007; Benz and Meier, 2008; Falk and Heckman, 2009). Prior studies of responsible investors have been conducted in lab experiments and the research subjects have been students (Glac, 2009; Barreda-Tarrazona et al., 2011), which threatens realism. According to Levitt and List (2007), there are three significant differences between incentivized lab experiments and field experiments on pro-social behavior. All three differences are relevant for our study. First, *stakes are higher* in field behavior since research subjects invest their own savings, not "play money". Moreover, investors have a stronger sense of entitlement to the funds, since they are earned in one way or another. Also, in the field individuals exercise more diligence and are more averse to risk (Irwin et al., 1992). All of these characteristics hold for our research subjects. Second, lab environments are *less context-rich* than the field, which implies a different triggering of social norms. In the field, investors are subject to the social norms that actually govern their behavior, which is not necessarily the case in the lab. In our study, this is further pronounced, since we study actual investors rather than students, which has been the case in prior studies. Finally, lab experiments are often criticized for being plagued by *experimenter demand effects*, i.e. research subjects may identify what is being studied and adapt their behavior in order to "please" the researcher (cf. Rosenthal, 1966). This is typically not the case in field experiments. Since our experimental treatment is "hidden" in the bank's newsletter and we study online banking data, our research subjects have no knowledge that they are part of the experiment.

2.2. Details of the experimental design

The context for our experimental study was Skandiabanken's implementation of a system for responsibility classification of mutual funds. This implies that the mutual funds offered to customers were the same as before, but new information about the mutual funds' ethical quality was provided alongside traditional financial information.

The classification system was designed as follows. Three levels of ethical quality were distinguished, and each given a symbol. First, the "ethically problematic" mutual funds were labeled with a red warning sign. This indicated that the funds included investments that investors *might* find ethically problematic, and additional information was available online, so that investors could evaluate it themselves. Secondly, the "neutral" funds were not labeled, i.e. they were placed in a category that did not have a symbol. This category comprised funds that were not seen as problematic from an ethical point of view, nor did they have an SRI profile or ethical focus. Thirdly, the responsible funds were labeled with a green leaf, and this category comprised mutual funds that were actively engaging an SRI approach (either negative or positive screening). Henceforth, we will refer to "problematic" or "non-responsible" funds as "red funds" and "responsible" funds as "green funds".

Our experimental treatment was related to the information provided to customers about the new classification system. Since the bank had not previously focused on SRI, this was the first time the customers received information about SRI from the bank. This enabled us to influence the initial information made available to customers. In connection with the introduction of the classification scheme in January 2011, the bank sent out information to all of their customers in an e-mail newsletter. The newsletters were sent both to existing mutual funds customers as well as to customers who did not own mutual funds at the time of the experiment.

We were allowed to manipulate the information in the newsletters, and we designed two versions of the newsletter in order to create two experimental groups. The variable that was manipulated was the information provided in the newsletter, which was tailored to frame the decision financially and non-financially, respectively. We randomized the two groups and sent each version of the newsletter to the respondents in each of the two groups.[6] In each newsletter there was a link to web sites with more information about SRI. Each of the two web sites was also customized with information that was consistent with the two types of framing.

All the information in the two versions of the newsletter and web sites was relevant and reliable, i.e. both newsletters included correct information about the investment product. However, it differed with respect to the aspects of SRI that were emphasized. In the financial manipulation, the SRI investment was framed as a financially attractive investment opportunity. For instance, it was

[6] See Table 1 below for details about the randomization. The randomization was successful, as indicated by the small discrepancy in the means in each of the columns.

emphasized that socially responsible companies are typically long-term oriented, and that they are less likely to experience reputational crises. In the non-financial manipulation, the SRI investment was framed as an opportunity to use one's investments to contribute to a just and sustainable economy. For instance, it was emphasized that the practice of SRI has been successful in influencing businesses towards more responsible business practices.

We record the type of newsletter sent to each customer, and can thus measure the relationship between the different manipulations and the subsequent information search and investment behavior. Due to randomization, we can interpret differences in the dependent variables (i.e. information search and investment behavior) between groups as resulting from the manipulation. We measure the dependent variables as follows. Information search is measured by the number of clicks on the links in the newsletters, which takes customers to the web sites with more information. Investment behavior is measured as trading activity in the funds, and was recorded right before and one month after the implementation.

There are several limitations to our experimental design. First, we have two experimental groups, but no control group. However, in the setting of the introduction of the classification scheme, it would be problematic to create a control group. Since we investigate the effects of decision frames, this would necessitate the existence of a "neutral" frame, but it is hard to envision what information could be considered neutral relative to the financial and the non-financial. Second, while we have considerable control over the information provided to customers by the bank, the field experiment does not allow us to control the additional information search carried out by customers prior to investment behavior. However, when investigating the clicks of customers, we find that customers who click for more information do so relatively soon after receiving the newsletter (see Figure 2 in the results section). Since additional information is interpreted in light of how the decision is initially framed (Weick, 1979), further information search after reading the initial information should however not completely undermine the effect of the framing. Regardless, the remaining difference would, if anything, arguably have been larger if we could completely control the information supply. Finally, it appears as if newsletters are a somewhat weak informational cue, since relatively few customers click for more information in both groups (see Table 2 below). In future studies, it would however be desirable to provide stronger informational cues to customers, thereby increasing the strength of the experimental treatment. For instance, customers could be subject to the financial advisory setting prior to decision making.

3. Hypothesis development

In this section, we develop our hypotheses. The paper aims to reveal whether financial or non-financial information is most significant in individual investors' decision making about SRI. We investigate this on two stages of the decision making process – information search and investment behavior. When the investor is faced by the investment decision, mental decision frames are activated in order to simplify, categorize and characterize information (Forbes, 2009). It is well-established that framing information differently can systematically affect the actions decision makers subsequently take (Dunegan, 1993, p. 491; Markovitz et al., 2011).[7] Tversky and Kahneman (1986, p. 251) further assert that "alternative descriptions of a decision problem often give rise to different preferences". Since investors have both financial and non-financial preferences (Statman, 2004; 2011), information about SRI can be framed as either financial or non-financial.

Traditional theories of rational decision making would suggest that investors were motivated solely by economic benefits, i.e. financial information would be most effective. However, prior studies suggest that investors are more motivated by information that is relevant for their social beliefs and values, i.e. non-financial information would be most effective (Glac, 2009; Barreda-Tarrazona et al., 2011). This is in line with theories of pro-social decision making, which suggest that individuals take the well-being of others into account in their own decisions. Based on the divergence between these two theories, we formulate our hypotheses as null hypotheses. This implies that we assume no difference between the decision making of investors who have a financial decision frame and customers who have a non-financial decision frame, neither on information search nor on investment behavior.

Our first hypothesis relates to information search, which is considered as a key stage in intendedly rational decision making processes (see e.g. Simon, 1959). In our experimental design, information search is the investors' immediate response to the treatment, i.e. the measure of information search is clicking for more information in the newsletter. Our information search hypothesis is stated as follows:

[7] For instance, Brown et al. (2008) have demonstrated that when consumers evaluate annuity products, annuities are less attractive when they are framed as "investments" than when they are framed as "consumption" (see also Brown et al., 2011).

Information Search Hypothesis:

Investors who have a financial decision frame and investors who have a non-financial decision frame will be equally likely to engage in search for information relevant to socially responsible investment.

Our second hypothesis deals with whether the frames lead to differences in actual investment behavior, i.e. purchases and sales of SRI mutual funds. This hypothesis thus relates to a later stage of the decision making process. Our investment behavior hypothesis is stated as follows:

Investment Behavior Hypothesis:

Investors who have a financial decision frame and investors who have a non-financial decision frame will be equally likely to invest socially responsibly.

The investment behavior hypothesis deals with investment decisions, and thus comprises both purchases and sales. Therefore we investigate both purchasing behavior and selling behavior of investors who are subject to the two decision frames, and similarly propose no difference between them. Moreover, we investigate the potential interaction effect between information search and investment behavior, i.e. whether investors who have engaged in further search for information relevant to SRI exert different investment behavior than those who have not. We report findings for each of these three elements comprised in the investment behavior hypothesis.

In the recent literature on financial literacy, it is demonstrated that investors differ in financial sophistication (see e.g. Lusardi and Mitchell, 2004). Our final hypothesis therefore deals with whether or not there are differences in SRI related investor behavior on the basis of the financial sophistication of investors. It is unclear whether or not financial sophistication influences investor decision making similarly on the pro-social domain. Therefore, we also formulate this hypothesis as a null hypothesis. Our financial sophistication hypothesis is stated as follows:

Financial Sophistication Hypothesis:

Regardless of their financial sophistication, there will be no difference in SRI related investor decision making by investors who have a financial decision frame and investors who have a non-financial decision frame.

Since the financial sophistication hypothesis relates to investor decision making, it comprises both information search and investment behavior. Therefore, the hypothesis relates to both stages of decision making. We report findings for these elements of the hypothesis separately.

The hypotheses outlined above form the basis for our experimental investigation. In the following, we present our results.

4. Results

In this section, we outline our results. First, we present summary statistics. Second, we outline the results for the information search hypothesis. Third, we present the results for the investment behavior hypothesis. Finally, we outline the results for the financial sophistication hypothesis. Reflecting the hypotheses above, we refer to investors who have received financial information as "financial frame investors" and to investors who have received non-financial information as "non-financial frame investors".[8]

[Table 1 about here]

Table 1 presents summary statistics for the sample used in the experiment. Panel A shows statistics from all customers of Skandiabanken who received e-mail. Although Skandiabanken is an online bank, and that one might expect a sample selection problem related to this, Panel A shows that Skandiabanken's customer group is heterogeneous along important socio-demographic variables. In Panel B, we show statistics from all customers who already own mutual funds, while Panel C shows statistics for customers who do not already own mutual funds. About 9 % of the sample is mutual fund owners. When we compare owners with non-owners, we find that those who own mutual funds are younger, wealthier and have purchased more products (of all varieties) in the bank. We divide

[8] Henceforth, we also consistently refer to all customers as "investors", regardless of whether or not they own mutual funds.

the sample according to the two experimental groups. The randomization has been successful, as indicated by the small discrepancy in the means in each of the columns.

4.1. The information search hypothesis

In this section, we outline the results for the information search hypothesis. Table 2 shows the percentage of investors clicking for more information. From Panel A, we find that 0.81 % of all investors click for further information about SRI funds. More interestingly, we find that 0.86 % of financial frame investors click, while 0.75 % of non-financial frame investors click. As indicated in Panel B, the difference is statistically significant at the 5 % level. We use *t*-tests to compare means, unless otherwise noted. In Figure 1, the fraction that clicks for more information is illustrated in a diagram. Error bars are standard errors of the mean.

[Table 2 and Figure 1 about here]

Table 3 shows the results from logistic regressions. Column 1 confirms the results from Table 2. Financial frame investors click statistically significant more than non-financial frame investors. As shown in Column 2, this result holds even if we control for socio-demographic variables. The sign of the coefficients of the socio-demographic variables are intuitive. Investors who have a low net wealth are less interested in further information. Investors who already own mutual funds are more likely to click for more information. Female investors click less than male investors, while young investors click less than older investors.

[Table 3 about here]

We moreover measure at what time an investor clicks for further information. Thereby, we can investigate whether there is a difference between the time at which the newsletter was sent and the time at which investors click for more information between the two different treatments. This is potentially interesting, since a difference could indicate that one treatment is more effective in the short term than the other. In Figure 2, we plot the ratio of clicks between the non-financial group and the financial group. The x-axis indicates the number of hours after receiving the newsletter. On the right hand side of the figure, we see the ratio after 2 weeks. As we move to the left hand side, we find the ratio for shorter periods. We find that the ratio is below 1 for the entire period. We do not find a large deviation from the mean, except for the first fifteen minutes. No formal test is done, but

one interpretation of this result is that financial information to a larger extent grabs investors' attention and makes them click faster than non-financial information.

[Figure 2 about here]

Our results reveal that there is a significant difference in information search following from the experimental treatment. This indicates that, on average, investors are sensitive to the information.

4.2. The investment behavior hypothesis

In this section, we outline the results for the investment behavior hypothesis. The results for purchasing, selling and the interaction effect are treated sequentially.

Table 4 shows the percentage of investors who buy a green mutual fund. This is a general measure of investment behavior, and a specific measure of *the decision to invest in green mutual funds*. Thus, it relates to purchasing. We investigate investors who already own mutual funds. Panel A shows that 13.4 % of all investors buy one or more green mutual funds. More interestingly, we find that 14.6 % of financial frame investors buy a green mutual fund, while 12.3 % of non-financial frame investors buy a green mutual fund. As indicated in panel B, the difference of 2.3 % is statistically significant at the 1 % level.

[Table 4 about here]

Table 5 shows the results from logistic regressions. Column 1 confirms the results from Table 4. Financial frame investors buy statistically significant more green mutual funds than non-financial frame investors. As shown in Column 2, this result holds even if we control for socio-demographic variables. The signs of the socio-demographic coefficients are similar to those found in Table 3 (regarding clicks for further information). Investors who have low net wealth are less likely to buy green funds, while female investors buy less than male customers. The dummy variable *Young* is the only variable that has a different sign in Table 5 compared with Table 3.

[Table 5 about here]

So far we include trades that are larger than NOK 100 (about 20 USD). Since many investors save a fixed amount every month, and these trades would not automatically be affected by the new classification scheme, we investigate larger trades. However, as shown in Column 3, we find that the dummy variable indicating that the investor received e-mail with financial information statistically significantly explains whether the investor bought green mutual funds also for trades larger than NOK 500. Our results reveal that there is a significant difference in purchasing activity related to SRI mutual funds following from the two treatment effects. This indicates that, on average, investors are sensitive to the information.

Table 6 shows the percentage of investors who sell red mutual funds. This is a general measure of investment behavior, and a specific measure of *the decision to divest from red mutual funds*. Thus, it relates to selling. Panel A shows that 0.46 % of investors sell a red mutual fund. More interestingly, we find that 0.53 % of financial frame investors sell non-responsible mutual funds, while 0.38 % of non-financial frame investors sell non-responsible mutual funds. As indicated in Panel B, the difference at 0.14 % is not statistically significant at the 10 % level. It should be noted that sales are not as relevant as purchases, since a sale is often initiated by liquidity needs or for tax reasons, and is as such not a decision influenced by information (Odean, 1998; Grinblatt and Keloharju, 2001). Still, the result is interesting. The fact that financial information is more influential than non-financial information is in line with previous results outlined above. Our results reveal that there is a difference – although not statistically significant – in selling activity related to red mutual funds due to the two treatment effects.

[Table 6 about here]

Table 7, Panel A, shows that investors who have engaged in information search regarding SRI (i.e. clicked the link in the newsletter in order to read more about SRI) will be more likely to invest socially responsibly than those who have not, regardless of whether they have received financial or non-financial information. We find that 13.2 % of investors who did not click for more information buy green mutual funds the first month after the introduction of the classification scheme, while 22.2 % of those who did click for more information buy green mutual funds. As shown in Panel B, the difference is significant.

[Table 7 about here]

We moreover investigate whether investors who received the different treatments and who clicked for more information will be influenced by the information treatment. Panel C shows that 25.2 % of investors who (1) received financial information and (2) clicked for more information buy green mutual funds. Similarly, 18.8 % of investors who (1) received non-financial information and (2) clicked for more information buy green mutual funds. As indicated in Panel D, the difference of 6.4 % is not statistically significant at the 10 % level. But if we compare the difference of 6.4 % with those who *did not* click for more information (2.3 %), we find that the economic difference is much larger.

Our results reveal that investors who have engaged in information search regarding SRI are more likely to invest socially responsibly than those who have not. Furthermore, we find that the financial decision frame – relative to the non-financial decision frame – leads to more trading for those who clicked than for those who did not. Due to the small sample, the difference is not statically significant, even though the economic difference is large for those who did click for more information.

4.3. *The financial sophistication hypothesis*

In the financial sophistication hypothesis, we test whether there is any interaction between financial sophistication and the decision frames on either clicks or trades (i.e. information search or investment behavior). The interaction effects indicate how much the influence of the information type received in the newsletter changes when one takes into consideration the investor's financial sophistication. We use net wealth as a proxy for financial sophistication (Calvet et al., 2009; Korniotis and Kumar, 2012). As shown in Table 1, net wealth refers to the total balance of all accounts, also including any deductions for negative balance due to a used housing credit and account credit.[9] The results reveal that there is a statistically significant interaction effect between net wealth and decision making.

Table 3, Column 3 and Table 5, Column 4 show the results for the interaction between investors' net wealth and information received for clicks and trades, respectively. The interaction term is zero for those who received non-financial information or who have high net wealth. The coefficient on

[9] It should be noted that the measure of net wealth only includes the investors' balance in Skandiabanken. Since investors may certainly have engagements also in other financial institutions, we cannot be sure that we are in fact measuring actual net wealth.

financial information thus indicates how much higher the logarithmic chance of clicking or buying green funds is for high net wealth investors who received financial information compared to high net wealth investors who received non-financial information. In both cases, the difference is statistically significant.

The low net wealth dummy indicates that low net wealth investors who received non-financial information to a lesser extent are influenced by information type (i.e. decision frame) than high net wealth investors who received non-financial information. The interaction effect indicates how much the influence of information type changes when one considers low net wealth investors instead of high net wealth investors. If high net wealth investors who received financial information already had a 0.25 higher logarithmic chance of clicking than high net wealth customers who received non-financial information, this would yield a 0.25 + (-0.37) = -0.12 lower log-chance of clicking for low net wealth investors who received financial information compared with low net wealth investors who received non-financial information. The result is similar for the purchasing of green funds. Thus, we find that the effects from the different decision frames vanish if we investigate the low net wealth investors. Our results reveal that financial sophistication significantly influences both clicking and trading in green funds.

5. Conclusion

In this section, we discuss our results and outline implications. Generally, our results reveal that investors are more influenced by information on the financial dimension of SRI investment products than non-financial information. Thus, investors with a financial decision frame are more likely to (1) search for further information and (2) invest responsibly than investors with a non-financial decision frame. Moreover, we find that this is the case for high net wealth investors, while there is no significant difference between the two treatments for low net wealth investors. Since the cut-off point between high and low net wealth investors indicates that the group of high net wealth investors constitute the majority of funds ownership in financial markets (see Table 3 and Table 5), this indicates that our results hold for the most significant group of investors.

Our results are in line with Statman's (2004) assertion that both financial and non-financial objectives are present in investors' decision making regarding SRI mutual funds. Our findings reveal that both financial and non-financial information lead investors to invest responsibly. However, financial information is more effective. Thus, our results do not suggest that financial benefits are all that SRI

investors desire. Rather, they may provide insight into the relative strength of the two objectives. First, regarding information search, 0.86 % of financial frame investors and 0.75 % of non-financial frame investors click for more information in the newsletter. This means that for every 100 financial frame investors who click, approximately 87 non-financial frame customers click. Second, regarding the investment decision, 14.6 % of financial frame investors and 12.3 % of non-financial frame investors click for more information in the newsletter. This means that for every 100 financial frame investors who buy green funds, approximately 84 non-financial frame customers buy such funds. We may interpret the results as reflecting the relative strength of the two objectives, and the difference is both economically and statistically significant.

Our experiment is similar to a *competing models study*, which implies that we lay out two models with differing predictions for the response to the manipulation (Card et al., 2011, p. 43). However, we do not test two formal theoretical models. As outlined in the hypothesis section, we rather contrast the prediction from traditional financial decision theory with a prediction based on empirical evidence that suggests that pro-social behavior in financial markets is motivated by expressive benefits. On the surface, our results are in line with traditional financial decision theory. However, as discussed above, we cannot conclude that the relative effectiveness of financial information implies that risk-adjusted returns are all that investors desire. In concrete terms, our results suggest that when investors are faced by the dual nature of SRI investment products, they act both with brain and heart. However, financial information remains primary to the decision.

Of our competing models, traditional financial decision theory seems to provide a better explanation for our findings. However, it appears as though a behavioral explanation could offer further insight into SRI related investor behavior. One reasonable interpretation of the results is that the investors' behavior can be seen as a form of "financial proof". It is well-documented that in decision situations characterized by uncertainty, decision makers aim to reduce uncertainty by employing *proof strategies* (Rao et al., 2001; Cialdiani, 2007).[10] Investors who consider the SRI option may be uncertain due to the product's relative novelty. While they will typically be familiar with the pro-social nature of the product, investors may therefore require information along well-known (i.e. financial) dimensions in order to view such investment products as "safe".

[10] Imitation of the decisions of others, or social proof, is the most common type of proof strategy. We suggest that the financial proof strategy can be a surrogate for social proof when the possibility of viewing others' behavior is absent. In such cases, acting on the perceived "consensus principle", in this case attending to financially relevant information, can serve as a proof strategy.

Let us illuminate this by returning to the example of the hybrid car. While it is certain that hybrid car owners have chosen their cars partly due to their environmentally beneficial characteristics, the economic dimension may still be decisive. If the prospective economic downside of hybrid cars was too considerable, it is likely that hybrid car sales would drop significantly. Accordingly, due to the relative novelty of the hybrid car, providing customers with financial information is risk-reducing for the customer. Generally speaking, for hybrid cars and SRI investments alike, it is likely that customers who are drawn to such products are initially attracted to them by virtue of their pro-social or pro-environmental characteristics. For exactly this reason, it is expedient to appeal to the financial benefits that the product offers to the customers.

Our results moreover tell us that SRI investors should not be viewed as a homogenous group. In particular, our findings reveal that financial sophistication is a salient characteristic of what influences investors. Again, a main question in the interpretation of our results is whether the "revealed" preferences in our study reflect the true preferences of the investors. We find that high net wealth investors are more influenced by financial information and as such act more in accordance with a utility maximization principle, while low net wealth investors are indifferent between the two types of information. Recent literature suggests that the low net wealth investors would have made decisions more similar to the high net wealth group if they had better skills or knowledge (cf. Choi et al., 2011; Ameriks et al., 2003). It is however an empirical question whether the behavior of low net wealth investors is in fact due to lower financial sophistication, or if it reflects their true preferences with regard to financial and non-financial objectives.

So what can we report back to the bank manager? First of all, our study suggests that there is limited value in the common approach of measuring people's intent to invest in SRI, as opposed to studying investors' actual investment behavior. Our findings thus suggest that there is a divergence between what people say and what they do. Second, our unobtrusive investigation of investors in the field indicates that financially relevant information plays a more important role than socially or environmentally relevant information in the decision of whether or not to invest responsibly. The implication is that distributors of responsible investment products should provide investors with financially sound arguments for investing responsibly. This is likely due to the fact that investors who consider the SRI option are already familiar with its pro-social nature, but rather require a form of "financial proof" of such investment products.

In the extension of our study, several potential avenues for future research have emerged. First of all, there is a need to further explore whether low net wealth investors suffer from financial illiteracy and therefore act in disharmony with their true preferences, or whether there is in fact a difference in the preferences of high net wealth and low net wealth investors. Second, following our argument that financial information provides a form of "proof" for investors who are interested in SRI mutual funds, it would be valuable to investigate whether products of a dual nature such as SRI create a need for various "proof" strategies. In that vein, it would be interesting to study the effect of social proof on investor behavior, i.e. how information about what other investors are doing would influence investment decisions.

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Figure 1

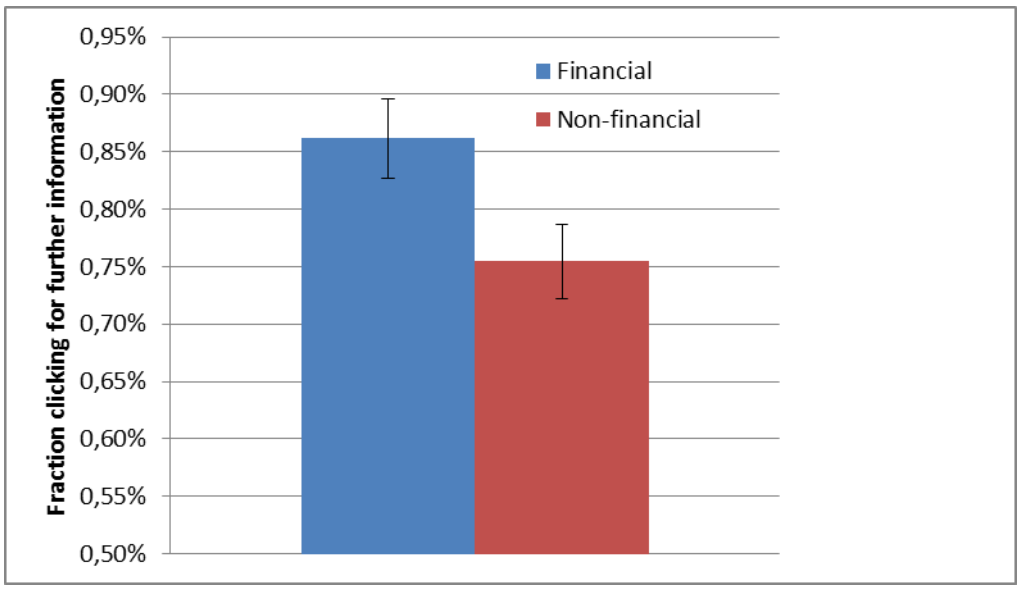
Fraction clicking for further information
0,95%
0,90%
0,85%
0,80%
0,75%
0,70%
0,65%
0,60%
0,55%
0,50%
Financial
Non-financial

Figure 2

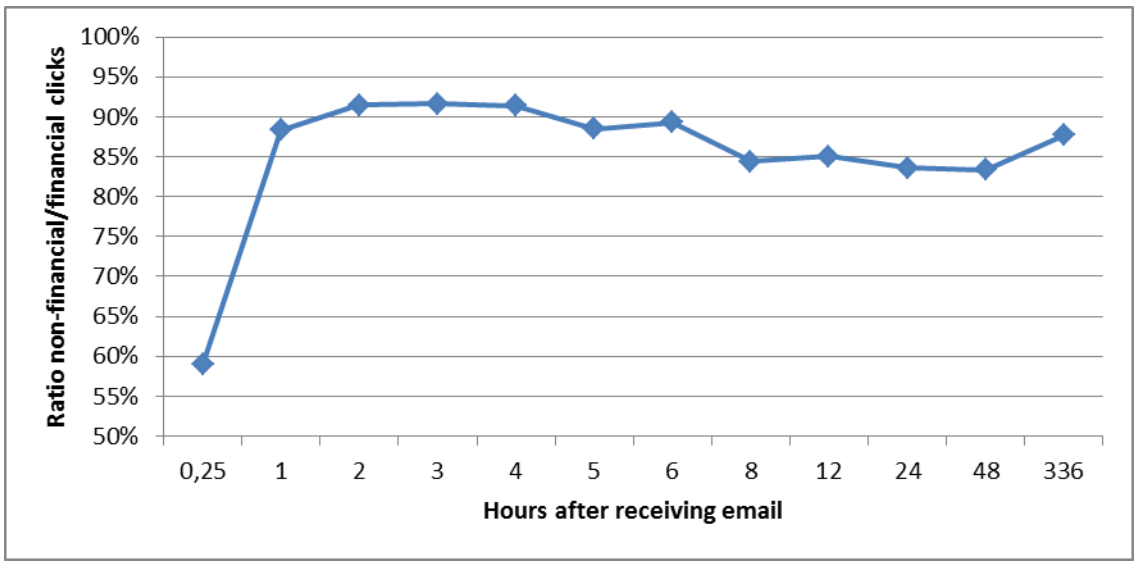
Ratio non-financial/financial clicks
100%
95%
90%
85%
80%
75%
70%
65%
60%
55%
50%
0,25
1
2
3
4
5
6
8
12
24
48
336
Hours after receiving email

Table 1

Summary Statistics

The table presents summary statistics for our sample at the start of the experiment. We report the mean of the variables. Age refers to the customer's age range. The intervals are defined as follows: 1: age between 18 and 27, 2: between 28 and 35, 3: between 36 and 44, 4: between 45 and 60, and 5: above 61. Net wealth is the total balance of all accounts, also including any deductions for negative balance due to a used housing credit and account credit. Unique products in the bank refer to total number of different products in the bank. Mutual funds refer to number of different mutual funds.

	Number	Female	Age	Net wealth	# unique products in the bank	# mutual funds
Panel A: All customers						
Receiving e-mail	142073	41.0 %	2.86	44701	3.03	0.45
Receiving e-mail with financial information	71037	41.1 %	2.87	44399	3.03	0.46
Receiving e-mail with non-financial information	71036	40.9 %	2.86	45003	3.03	0.44
Panel B: Customers owning mutual funds						
Receiving e-mail	13149	28.0 %	2.84	64192	6.28	4.84
Receiving e-mail with financial information	6644	27.8 %	2.84	64352	6.28	4.89
Receiving e-mail with non-financial information	6505	28.2 %	2.84	64028	6.29	4.79
Panel C: Customers not owning mutual funds						
Receiving e-mail	128924	42.3 %	3.07	42713	2.70	0
Receiving e-mail with financial information	64393	42.5 %	3.08	42341	2.69	0
Receiving e-mail with non-financial information	64531	42.2 %	3.07	43085	2.70	0

Table 2

Percentages clicking for further information in the two treatments

The table presents the percentage of investors clicking for more information. The percentages are shown for all investors, and for the two different treatment groups. In order to check if the differences are significant, we use *t* tests for two-sample means assuming unequal variances. Two-sided test.**Significant at 5 %

	Number	Percentage clicking (%)	Std.Err. (%)	95 % Confidence Interval (%)	
		Panel A:			
Receiving e-mail	142073	0.81			
Receiving e-mail with financial information	71037	0.86	0.03	0.79	0.93
Receiving e-mail with non-financial information	71036	0.75	0.03	0.69	0.82
		Difference (%)	t test p value	t value	
		Panel B:			
Difference		0.11**	0.024	2.25	

Table 3

Determinants of Preference for Clicking on link to more information

The table reports logistic regressions where the dependent variable is based on a dichotomous variable that obtains the value of one if the customer clicks for more information, and zero if not. The independent variables are dummy variables. The financial e-mail variable is one if the investor has received an email with financial information. The low net wealth variable is one if net wealth is below the median value for the sample. The median value for this sample is NOK 4,239. The young variable is one if age is below the median value for the sample. The other mutual funds variable is one if the investor has other mutual funds. The interaction variable *Fin. e-mail x low net wealth* is one if the investor has both received an email with financial information and has a low net wealth. z-statistics are reported in parentheses.

		Dichotomous variable, click or no click		
	Mean	(1)	(2)	(3)
Financial e-mail	0.50	0.13	0.13	0.25
		(2.3)	(2.2)	(3.4)
Low net wealth	44,701		-0.59	-0.40
			(-8.9)	(-4.3)
Young	2.86		-0.62	-0.62
			(-10.3)	(-10.4)
Female	0.41		-0.11	-0.11
			(-1.8)	(-1.8)
Other Mutual Funds	0.09		1.16	1.16
			(16.8)	(16.8)
Fin. e-mail x low net wealth				-0.37
				(-2.9)
Intercept		-4.9	-4.4	-4.5
		(-112.5)	(-69.3)	(-65.4)
N		142,073	142,073	142,073
R^2		0.0004	0.0402	0.0408

Table 4

Percentages Buying Green Funds

The table presents the percentage of investors that buy a green mutual fund. The percentages are shown for all investors, and for the two different treatment groups. In order to check if the differences are significant, we use *t* tests for two-sample means assuming unequal variances. Two-sided test. *** Significant at 1 %.

	Number	Percentage buying (%)	Std.Err. (%)	95 % Confidence Interval (%)	
		Panel A:			
Receiving e-mail	13139	13.43			
Receiving e-mail with financial information	6636	14.56	0.43	13.71	15.41
Receiving e-mail with non-financial information	6503	12.29	0.41	11.49	13.08
		Difference (%)	t test p value	t value	
		Panel B:			
Difference		2.27***	0.000	3.82	

Table 5

Determinants of Preference for Buying Green Funds

The table reports logistic regressions where the dependent variable is based on a dichotomous variable that obtains the value of one if the investor buy a green mutual fund, and zero if not. In column (1), (2), and (4) the trade size has to be larger than NOK 100 for the dependent variable to obtain the value of one, while in column (3) the trade size has to be larger than NOK 500. The independent variables are dummy variables. The financial e-mail variable is one if the investor has received an email with financial information. The low net wealth variable is one if net wealth is below the median value for the sample. The median value for this sample is NOK 31,650. The young variable is one if age is below the median value for the sample. The interaction variable *Fin. e-mail x low net wealth* is one if the investor has both received an email with financial information and has a low net wealth. The sample in this table only includes investors that own mutual funds. z-statistics are reported in parentheses.

	Dichotomous variable, buying or not			
	(1)	(2)	(3)	(4)
Financial e-mail	0.20	0.20	0.22	0.26
	(3.8)	(3.8)	(2.5)	(3.7)
Low net wealth		-0.26	-0.29	-0.19
		(-5.1)	(-3.4)	(-2.5)
Young		0.20	0.04	0.20
		(3.6)	(0.4)	(3.6)
Female		-0.04	-0.48	-0.04
		(-0.7)	(-4.5)	(-0.7)
Fin. e-mail x low net wealth				-0.14
				(-1.4)
Intercept	-2.0	-1.95	-2.99	-1.99
	(-52.0)	(-33.6)	(-31.6)	(-31.1)
N	13,139	13,139	13,139	13,139
R^2	0.0014	0.0051	0.0085	0.0051

Table 6

Percentages Selling Red Funds

The table presents the percentage of investors that sell a red mutual fund. The percentages are shown for all investors, and for the two different treatment groups. In order to check if the differences are significant, we use *t* tests for two-sample means assuming unequal variances. Two-sided test.

	Number	Percentage selling (%)	Std.Err. (%)	95 % Confidence Interval (%)	
		Panel A:			
Receiving e-mail	13139	0.46			
Receiving e-mail with financial information	6636	0.53	0.09	0.35	0.70
Receiving e-mail with non-financial information	6503	0.38	0.08	0.23	0.53
		Difference (%)	t test p value	t value	
		Panel B:			
Difference		0.15	0.224	1.22	

Table 7

Percentages clicking for more information, owning mutual funds and buying Green Funds

Panel A presents the percentage of investors that buy a green mutual fund given that they have clicked for more information, while Panel C presents for the two different treatment groups the percentage of investors that buy a green mutual fund given that they have clicked for more information. In Panel B and D we check if the differences are significant. We use *t* tests for two-sample means assuming unequal variances. Two-sided test. *** Significant at 1 %.Two-sided test. ***Significant at 1 %.

	Number	Percentage buying (%)	Std.Err. (%)	95 % Confidence Interval (%)	
		Panel A:			
Not clicking for more information	12824	13.21	0.30	12.63	13.80
Clicking for more information	315	22.22	2.35	17.61	26.84
		Difference (%)	t test p value		t value
		Panel B:			
Difference		9.00***	0.000		3.81
	Number	Percentage buying (%)	Std.Err. (%)	95 % Confidence Interval (%)	
		Panel C:			
Receiving e-mail with financial information	171	25.15	3.33	18.58	31.71
Receiving e-mail with non-financial information	144	18.75	3.26	12.30	25.20
		Difference (%)	t test p value		t value
		Panel D:			
Difference		6.40	0.171		1.37