



Investment Barriers and Labeling Schemes for Socially Responsible Investments

Gunnar Gutsche¹  · Bernhard Zwergel²

Received: 6 November 2018 / Accepted: 12 February 2020 / Published online: 21 February 2020
© The Author(s) 2020

Abstract Given the increasing role of socially responsible investing (SRI), but still limited participation of individual (i.e. small, retail) investors, the objective of this study is twofold: (i) We aim to identify investment barriers regarding SRI for individual investors and analyze to what extent these barriers vary across different investor groups. (ii) We analyze to what extent sustainability or transparency labels can help to overcome these barriers. To this end, we empirically analyze data from a survey and a stated choice experiment for a broad sample of financial decision makers in German households. The results suggest that a considerable amount of respondents can imagine to invest in a socially responsible manner, which is promising for policymakers and practitioners who aim to foster sustainable development and SRI. However, too high information costs are a severe barrier for potential future investors and a considerable share of respondents distrusts providers of socially responsible investment products. Banks, who could help to solve this problem, appear not to fulfill their role as intermediaries. But we find that labels might serve as a complement to banks. Especially sustainability certificates that confirm the consideration of sustainability criteria could decrease information costs and overcome at least some barriers for some investor groups, particularly for new investors. However, the results also suggest that a certain degree of basic knowledge and trust in providers of socially responsible investment products is required before labels work efficiently.

✉ G. Gutsche
gunnar.gutsche@uni-kassel.de

B. Zwergel
b.zwergel@uni-kassel.de

¹ Faculty of Economics and Management, University of Kassel, Nora-Platiel-Str. 5, 34109 Kassel, Germany

² Faculty of Economics and Management, University of Kassel, Henschelstr. 4, 34109 Kassel, Germany

Keywords Socially responsible investing · Survey · Discrete choice experiment · Labeling schemes · Investment barriers

JEL-Classification Code C25 · G11 · M14 · Q56

1 Introduction

Over the last years, socially responsible investing (SRI), i.e. investment strategies combining financial, environmental, social, and governance (ESG) issues, have been increasingly recognized in academic research and practice. Current figures show that the total volumes of SRI strategies (e.g. exclusions, norm-based screening, or best-in-class) across Europe have grown strongly by double- or even three-digit growth rates during the last years (e.g. Eurosif 2016; FNG 2018). Today almost every conventional investment product has its socially responsible counterpart and asset managers in this field expect ongoing market growth (e.g. FNG 2018). However, for example in Germany, as Europe's largest economy, the share of socially responsible funds and mandates still only represents 3% of the total market and only 9% of SRI is carried out by individual (i.e. small, retail) investors (e.g. FNG 2018). The market for SRI is thus still a niche market.

Nevertheless, given the current global environmental challenges, there is a need for a redirection of capital flows and to mobilize private investors in order to achieve the (inter-)national climate goals and to finance the related necessary energy and economic transition processes (e.g. UNFCCC 2015; Mathews et al. 2010). Therefore, it will be key to understand the behavior of (institutional and individual) investors in the context of SRI, as they will not only severely affect the success of these goals, but also financial markets and polluting firms if their share exceeds a certain threshold (e.g. Heinkel et al. 2001).¹

Although institutional investors are key actors in this discussion as they dominate the market for SRI in terms of investment volume (e.g. FNG 2018), from an academic and political perspective, however, individual investors are nevertheless of great interest. For example, SRI provides a way to actively involve individual investors in sustainable development and thus to positively affect the level of acceptance among citizens for these processes, which might severely affect the way of life they are used to. Indeed, some individual investors seem to gain additional, non-financial utility from the sustainability attribute (e.g. Benson and Humphrey 2008; Bollen 2007; Dorfleitner and Nguyen 2016). However, this alone may not be sufficient for mobilizing individual investors as their participation costs might be too high to join the market or actively shift their portfolio.² Particularly infor-

¹ Indeed, for example, Derwall et al. (2011) show, in line with their “shunned-stock hypothesis”, that values-driven investors can affect stock prices in the long-run as they boycott socially controversial stocks, which in turn increases relative share prices of companies with a high sustainability performance.

² The concept of participation costs is often used as explanation for limited stock market participation or inertia (e.g. Bonaparte and Kumar 2013; Guiso et al. 2008; Haliassos and Bertaut 1995; Vissing-Jorgensen 2004).

mation and search costs could represent an important barrier for SRI (Benson and Humphrey 2008), since SRI is naturally more complex than conventional investing due to the additional variety of screening and investment strategies, which may raise information asymmetries between providers and customers (e.g. Borgers and Pownall 2014; Rhodes 2010). Consequently, SRI may not only be an opportunity but also a challenge for individual investors, which could result in too low participation levels.

Indeed, there is some empirical evidence suggesting that individual investors have problems to make consistent decisions regarding retirement savings when they are additionally confronted with the sustainability dimension (e.g. Borgers and Pownall 2014) or have irrational beliefs about the relationship between returns and risk of socially responsible funds (e.g. Hartzmark and Sussman 2019). However, among the scarce studies on individual investor decisions and SRI, only a very few examine which different investment barriers³, such as the perceived financial performance (e.g. Bauer and Smeets 2015; Nilsson 2008; Paetzold and Busch 2014; Riedl and Smeets 2017; Wins and Zwergel 2016), distrust (e.g. Nilsson 2008; Wins and Zwergel 2016), the performance of banks as intermediaries (Schrader 2006), or the individual level of financial literacy (e.g. Borgers and Pownall 2014; Riedl and Smeets 2017), may prevent individual investors from SRI.⁴

Thus, the first objective of this paper is to empirically analyze which barriers prevent individual investors from SRI and to what extent they vary across different investor groups. We thereby aim to identify potential investors that might invest in a socially responsible manner after certain hurdles have been removed. Secondly, we empirically examine to what extent these barriers may be overcome by labeling schemes for SRI provided by the state or non-governmental organizations (NGOs).

By considering labeling schemes, we focus on a typical instrument that has the potential to decrease information and search costs (e.g. Teisl et al. 2002) and might drive firms towards environmentally friendlier production techniques and thus increase environmental quality (e.g. Amacher et al. 2004; Ibanez and Grolleau 2008). Thereby, we address a vivid and important topic as indicated by the current debate about a taxonomy for sustainable finance (e.g. European Commission 2018) and shed light on already existing (non-)governmental labels for socially responsible equity funds,⁵ which has hardly received attention in previous empirical academic studies.

³ By using the term “barrier”, we mean factors that prevent investors from investing (more) although their saturation point for SRI has not been reached. Of course, individual investors could also be just satisfied with a certain share of socially responsible investments in their total portfolio indicating a saturation point (e.g. Dorfleitner and Nguyen 2016) and that their utility is not necessarily maximized if they invest their total wealth in a socially responsible manner (Dorfleitner and Nguyen 2017).

⁴ Empirical studies in this field mainly focus on their (non-)financial motives and characteristics (e.g. Bauer and Smeets 2015; Dorfleitner and Utz 2014; Gutsche et al. 2019; Nilsson 2008; Riedl and Smeets 2017; Wins and Zwergel 2016) or to what extent they are willing to sacrifice return in order to invest in socially responsible investments (e.g. Dorfleitner and Utz 2014; Gutsche and Ziegler 2019).

⁵ Indeed, in the field of SRI currently both governmental labels as well as those published by independent organizations already exist. There has been growing interest in the recent years to establish transparency guidelines, transparency labels, or sustainability labels to facilitate private investors’ search for and the transparency of socially responsible equity (or generally mutual) funds. In Europe, the existence of transparency labels by Eurosif, the Austrian Ecolabel, the French Novethic SRI Label, the French Novethic

Exceptions are the studies by Bassen et al. (2019), Døskeland and Pedersen (2016), Gutsche and Ziegler (2019), and Hartzmark and Sussman (2019).⁶ However, none of these studies analyze whether labeling schemes help to overcome barriers, particularly for investors who have no socially responsible investments yet, but might want to invest in a socially responsible manner in the future.

To this end, we empirically analyze data from an online survey among financial decision makers in German households. The survey comprises a questionnaire and two stated choice (SC) experiments, which referred to hypothetical investment decisions regarding fixed-interest investment products and equity funds, respectively. In this study, we focus on the latter experiment as labels are most common for this class (see footnote 5).⁷ In this SC experiment, respondents were confronted with eight successive (hypothetical) investment tasks, in which they were asked to select one out of four equity funds. The funds only differed with respect to selected financial (i.e. the value of the subscription fee, the net return in the last year, and the average annual net return in the last five years) and non-financial (i.e. the inclusion of (certified) sustainability criteria and transparency logos) attributes. This allows us to analyze the effect of these attributes, and particularly labeling schemes, on individual investment decisions and especially differences across investor groups. We thereby make use of some features of SC experiments, which do not apply to alternative approaches, and simultaneously apply several techniques to mitigate hypothetical bias, which is a potential problem of stated preferences data in general (e.g. Hensher et al. 2010).⁸

We use the questionnaire data to answer the first research question. Therefore, we do not only distinguish between current socially responsible and conventional investors, but extend the approach by Wins and Zwergel (2016) and additionally identify current socially responsible investors who want to divest from socially responsible investment products in the future, i.e. skeptical investors, as well as current conventional investor who plan to conduct SRI in the future, i.e. potential socially responsible investors. We find that about 45% of the respondents could imagine to invest in a socially responsible manner in the future. However, too high information costs are indeed a severe barrier for potential future socially responsible investors. In particular, banks, who serve as an important information source for at least half of the respondents, appear not to fulfill their role as intermediaries. Further, a considerable share of respondents distrusts providers of socially responsible investments, which in turn prevents them from (future) SRI. Hence, targeted and trustworthy

Green Fund Label, or the German FNG label for sustainable mutual funds as well as the current debate about a taxonomy for sustainable finance (e.g. European Commission 2018) indicate the importance of this topic. Appendix A gives a more detailed overview of existing labels in the European market for SRI.

⁶ Døskeland and Pedersen (2016) consider the introduction of a labeling scheme for funds, but cannot directly identify the effect of labels. The other three studies show that some individual investors react to labels for socially responsible funds. Gutsche and Ziegler (2019) even find a considerable mean willingness to sacrifice returns for labels.

⁷ For a detailed discussion and the description of the other experiment on the choice among fixed-interest rate products see Gutsche and Ziegler (2019) who use this approach to estimate (the determinants of) mean willingness to pay (i.e. to sacrifice returns) for SRI in general, the implementation of sustainability certificates, or transparency logos in particular.

⁸ See Sect. 3.2 for a more detailed discussion.

information disclosure about SRI, for example via labeling schemes, might enhance their willingness to invest in a socially responsible manner.

Indeed, the analysis of the experimental data reveals that labels could decrease information costs and overcome at least some barriers for some investor groups. While we find positive stated preferences for sustainability certificates as well as transparency logos among all investor groups, these labels particularly seem to lower entry costs for new investors and might serve as a substitute or at least a complement for banks that do not fulfill their role as intermediaries appropriately. However, the results also suggest that a certain degree of basic knowledge of SRI and trust in providers of socially responsible investments is required in order to make labels work.

Thus, our empirical analyses complement previous studies that consider individual investment barriers as well as the role of labeling schemes for SRI and thereby also contributes to academic research on the determinants of socially responsible (investment) behavior. Additionally, these results provide an empirical foundation for the discussion on more transparency and a taxonomy for SRI and are thus relevant for practitioners and policymakers who are interested in the growth of SRI.

The remainder of the paper is structured as follows: Sect. 2 derives the hypotheses to be tested empirically. Sect. 3 describes the survey, the experimental design, and the variables that are used in the econometric analyses. Sect. 4 presents the results from bivariate analyses and particularly estimation approaches in multinomial and mixed logit models. Sect. 5 concludes.

2 Hypotheses

According to theory, individual investors only join a market or actively shift their portfolio if their participation costs, i.e. the costs for information search and processing as well as transaction costs,⁹ do not exceed a given threshold (e.g. Guiso et al. 2008; Haliassos and Bertaut 1995; Vissing-Jorgensen 2004). Both types of costs can exist in terms of initial one-time, i.e. entry costs faced by new investors (e.g. time spent on searching, learning, and understanding initial information about a certain investment product), and periodical costs, such as total expense ratios in case of mutual funds, or costs for time spent for managing one's own portfolio and finding new investment opportunities (e.g. Favilukis 2013; Vissing-Jorgensen 2004). Thus, information costs depend on the individual investors' needs to search and understand information on, for example, an asset (class), the related market, or the whole economy, and are thus also related to individual levels of financial literacy, cognitive abilities, or the level of trust with respect to the market or its participants (e.g. Campbell 2006; Guiso et al. 2008).¹⁰

⁹ Transaction costs are particularly important in case of indirect stockholding and comprise, for example, brokerage fees, costs for setting up accounts, annual costs for funds managers, or costs linked to trading volume (e.g. Haliassos and Bertaut 1995; Vissing-Jorgensen 2004).

¹⁰ Costs for these processes are often interpreted as lump sum costs, fixed entry costs, opportunity costs valuing the time spent by investors, or an individual's psychological state that makes them not feel suffi-

Since SRI is naturally more complex than conventional investments, as mentioned above, information and search costs should be higher than for conventional investments and thus may represent an important barrier for individual investors. Therefore, we aim to empirically test the following hypothesis:

Hypothesis 1: Limited SRI market participation of individual investors is strongly driven by too high participation costs, i.e. information and search costs.

Assuming that investors are confronted with too high participation costs and that it is virtually impossible for an individual investor to assess, for example, whether the stocks included in the fund portfolio are indeed socially responsible (e.g. Entine 2003),¹¹ eco-labels might be a promising tool to address these issues. The underlying reasoning is that labels can overcome market failures arising from information asymmetries between providers and customers by providing new information or making information more salient to consumers, and consequently decrease information and search costs (e.g. Cason and Gangadharan 2002; Teisl et al. 2002). Labels thereby do not only have the potential to increase market participation, but they can also increase consumers' awareness about certain product- and production-related environmental issues and thus inform and educate them about (potential) impacts of products on the environment (e.g. Brécard et al. 2009; Teisl et al. 2002). Thus, the second purpose of this paper is to empirically test the following hypothesis:

Hypothesis 2: Sustainability and transparency labels provided by the state or NGOs can help to overcome barriers of individual investors arising from information and search costs for socially responsible investment products.

3 Data, Experimental Design, and Variables

The data for the empirical analysis stem from a web-based survey that was conducted in cooperation with the German market research institute GfK SE during December 2013 and January 2014. The objective of the survey was to consider socially responsible investment behavior among financial decision makers in German households from several perspectives. To this end, the survey comprised a questionnaire (containing questions on general investment decisions, attitudes towards SRI, consumption behavior, and socio-demographic factors) and two SC experiments, which referred to hypothetical investment decisions regarding fixed-interest investment products and equity funds, respectively. Financial decision makers were defined as persons who are at least 18 years old and mainly or equally responsible for financial decisions in the household. In order to ensure that the respondents have already had at least some investment experiences, we additionally required

ciently comfortable to invest in a product (e.g. Allen and Santomero 2001; Campbell 2006; Haliassos and Bertaut 1995; Vissing-Jorgensen 2004).

¹¹ Thus, socially responsible funds are credence goods (e.g. Bonroy and Constantatos 2014).

the respondents to not only have a checking account, but at least (also) a savings account.¹²

The market research institute was commissioned to draw an online representative sample (in terms of age, gender, and place of origin) of 1000 respondents from their internal online panel containing about 38,000 panelists at the time of the survey. Each respondent received the research institute's usual financial incentive for participating in the survey.¹³ In order to ensure the validity of the survey, the market research institute routinely uses a quality saving system. This tool helps to identify and exclude respondents with qualitatively inadequate response behavior (e.g. in terms of short response times or systematic response patterns) and to re-recruit new respondents during the field phase (according to the quota with respect to age, gender, and place of origin).¹⁴ In our case, 172 respondents were excluded from the sample during the interview process according to this procedure. After all, our initial sample contains 1001 respondents.

As the SC experiment considered in this study refers to the choice among equity funds, we additionally required higher levels of investment knowledge among participants of this experiment than it was necessary for the participation in the survey in general or the other SC experiment (which referred to less complex fixed-interest investments).¹⁵ Therefore, only respondents who indicated that they have already invested in or are sufficiently informed about equity funds, stocks, or other complex investment products (e.g. bond funds, mixed funds, open property funds) were included. The requirements were only met by 801 of all 1001 respondents. Consequently, the following empirical analysis is only based on this subsample.

¹² We include this criterion in order to increase the validity of our results. This is a common procedure in order to ensure a basic understanding of the decision problem and is applied in several fields of economic research, such as financial economics (e.g. Bassen et al. 2019; Gamel et al. 2017; Lee and Veld-Merkoulova 2016), transportation economics (e.g. Ziegler 2012), or energy economics (e.g. Kalkbrenner et al. 2017). For example, Bassen et al. (2019), who aim to analyze the impact of climate information on individual investors' decisions, only include respondents that were invested in stocks, funds, pension plans, or other retirement funds. In the context of investments in renewable energies, Gamel et al. (2017) required experience in financial investments, such as stocks, open equity funds, or bonds. Lee and Veld-Merkoulova (2016) only consider members of the CentERdata panel that invested in stocks or mutual funds in order to analyze portfolio evaluations of individual investors.

¹³ Beyond that, the respondents do not receive any further incentives (i.e. payments depending on their investment decisions). This is a typical procedure in SC experiments or conjoint analyses (e.g. Bassen et al. 2019; Hartzmark and Sussman 2019; Nakai et al. 2018; Wilcox 2003), which often comprise hypothetical scenarios, alternatives, or attributes. However, we included some typical techniques in order to mitigate potential hypothetical bias, as described below.

¹⁴ To be more precise, a quality index, ranging from 0 to 100, is constructed depending on several factors (i.e. response patterns, total response duration, and the quality of open questions). Accordingly, "bad" interviews are characterized by a short total response duration, systematic response behavior, and unanswered open questions and are indicated by a low quality index value. Interviews with quality index values lower than 30 are checked and mostly excluded. Generally, quality and plausibility checks and the exclusion of low-quality observations are a typical procedure during and after the field phase of surveys (see e.g. Bertsch et al. 2017; Kalkbrenner et al. 2017).

¹⁵ For further explanations, see again footnote 12.

Table 1 Definition and size of investor groups

Statement	Investor group (Abbreviation)	Absolute frequency (Relative frequency in %)
I currently own sustainable investments and I will still invest in sustainable investments in the next three years.	Socially responsible investors (SRs)	109 (13.61)
I currently own sustainable investments, but I will not invest in sustainable investments any more in the next three years	Skeptical investors (SKs)	83 (10.36)
I currently do not own sustainable investments, but I will invest in sustainable investments in the next three years	Interested investors (INTs)	248 (30.96)
I currently do not own sustainable investments and I will not invest in sustainable investments in the next three years	Conventional investors (CONVs)	361 (45.07)

This table reports the absolute and relative frequencies for the filter question that allows us to divide the 801 respondents into the four different investor groups, i.e. socially responsible investors (SRs), skeptical investors (SKs), interested investors (INTs), and conventional investors (CONVs)

3.1 Variables for the Analysis of Investment Barriers

We identify investors that currently own socially responsible investments, but also potential future investors, with a filter question similar to the corresponding question used by Wins and Zwergel (2016). We asked the respondents to select one of the statements reported in Table 1 and divided the respondents into four groups, i.e. socially responsible investors (SRs), skeptical investors (SKs), interested investors (INTs), and conventional investors (CONVs).

Table 1 shows that 109 of the 801 participants in the SC experiment are SRs (13.61%), 83 respondents are SKs (10.36%), and 248 respondents are INTs (30.96%). The group of CONVs is the largest group containing 361 respondents, which corresponds to a share of 45.07%. Accordingly, 23.97% of the participants in the SC experiment are currently invested in socially responsible investments (i.e. SRs and SKs) and 44.57% are potential future investors (i.e. SRs and INTs). Though these figures are hypothetical, and we are aware of potential limitations of this categorization due to the attitude-behavior gap, they suggest that about 45% of the participants in the SC experiment can imagine investing in a socially responsible manner in the future, which is almost twice the number of current socially responsible investors. Based on this classification, we construct the multinomial variable ‘Investor type’ that takes the value one for SRs, two for SKs, three for INTs, and four for CONVs. This variable serves as dependent variable in the econometric analysis in Sect. 4.

We aim to capture factors that could prevent individual investors from SRI with five different variables referring to perceived information and search costs, two variables for the perceived financial performance of socially responsible compared to conventional investments, and one variable for the perceived transaction costs, which we all briefly motivate and define in the following.

Previous studies on barriers of stock market participation find that little economic or financial knowledge (e.g. measured as self-assessed knowledge or financial literacy scores) is an important determinant of individual investment behavior (e.g. Calvet et al. 2009; Campbell 2006; García 2013; van Rooij et al. 2011). Campbell (2006) states that retail markets are often inert and it takes time until, particularly financially less sophisticated, individual investors adopt and accept new financial products. Borgers and Pownall (2014) empirically show that financially literate people are less likely to make inconsistent decisions with respect to SRI and argue that investors with low financial literacy scores are not able to consider financial and non-financial preferences at the same time. Accordingly, we assume that investors with too little knowledge of SRI face higher information costs as they have to spend more time and money for gathering and understanding information, and are thus less likely to invest in a socially responsible manner.

In order to measure the individuals' knowledge of SRI, we asked the respondents to indicate on a scale with the five ordered response categories "totally disagree", "rather weakly agree", "neither strongly nor weakly agree", "rather strongly agree", and "very strongly agree" how strongly they agree with the statement "I know too little about sustainable investments."¹⁶ On this basis, we construct the dummy variable 'Too little knowledge' that takes the value one if the respondent strongly agreed with the statement, i.e. selected either "I rather strongly agree" or "I totally agree". Table 2 reports the basic descriptive statistics for this and all further variables. It shows that almost half of the respondents self-assess their knowledge of SRI as too little.¹⁷

For measuring the individuals' degree of information on financial products in general, and thus their degree of financial sophistication, we ask the respondents to indicate the information sources they use before they invest in a financial product. The respondents could make a multiple selection out of nine different categories and a no-choice option. Table 3 shows that the internet (52.31%), bank advisors (49.19%), and persons from their social environment (40.82%) are the most important information sources for the respondents. Interestingly, we find differences between the four investor groups. For example, SRs and INTs consult the internet more often than SKs or CONVs, while INTs and CONVs seem to contact their bank advisor a little more often than SRs and SKs.

Based on these answers, we construct the count variable 'Number of information sources' reflecting the number of selected information sources. As reported in Table 2, all respondents use at least one information source before investing in a financial product and the average number of information sources is 2.53.

Since this measure relates to information on financial products in general and also captures the involvement of individuals in their investment decisions as they

¹⁶ With the exception of the questions about their age and gender, the respondents had the option to answer "No answer/I don't know" to all of the questions used for the construction of the explanatory variables. Respondents that chose this option are interpreted as missing values and thus excluded from the econometric analysis.

¹⁷ We conduct a detailed analysis of the different views across the four investor groups with respect to these variables in Sect. 4.1.1.

Table 2 Descriptive statistics of individual investment barriers and characteristics

Variables	Number of observations	Mean	Standard deviations	Minimum	Maximum
<i>Perceived information costs</i>					
Too little knowledge	765	0.50	0.50	0	1
Number of information sources	768	2.53	1.29	1	8
Poorly informed	781	0.61	0.49	0	1
No offer by bank	739	0.62	0.49	0	1
Distrust	734	0.38	0.49	0	1
<i>Perceived (relative) financial performance</i>					
Lower return	646	0.59	0.49	0	1
Higher risk	665	0.33	0.47	0	1
<i>Perceived (relative) transaction costs</i>					
Higher fees	635	0.36	0.48	0	1
<i>Sociodemographic and socioeconomic variables</i>					
Age	801	44.71	12.69	19	78
Female	801	0.44	0.50	0	1
University degree	799	0.38	0.49	0	1

This table reports the descriptive statistics for the individual investment barriers and characteristics, i.e. for all explanatory variables, that are used in the subsequent econometric analysis in Sect. 4.1.2. With the exception of the questions about their age and gender, the respondents had the option to answer “No answer/I don’t know” to all of the questions used for the construction of these variables. Respondents that selected this option are excluded from the econometric analysis. Consequently, the number of absolute observations varies across the different variables due to missing values, except for ‘Age’ and ‘Female’

actively search for information, we further aim to capture the respondents’ perceived degree of information on SRI by asking them to state how strongly they agree with the statement “I feel poorly informed about sustainable investments.” as reason why they do not invest (more strongly) in a socially responsible manner (now or within the next three years).¹⁸ The resulting dummy variable ‘Poorly informed’ takes the value one if the respondent strongly agreed with this statement, and zero otherwise. Table 2 shows that 61.33% of the investors state that feeling poorly informed about SRI is a reason why they do not invest (more strongly) in socially responsible investments.

Allen and Santomero (2001) highlight the role of intermediaries (e.g. banks) as another important (potential) barrier related to information costs, as they can lower information barriers by helping to solve complex problems of investors, especially in areas where asymmetric information problems could exist. In the context of SRI,

¹⁸ Since we asked investors who were currently invested as well as investors with no current socially responsible investments in their portfolio, we used two slightly different formulations for this question and also in case of the variables ‘No offer by bank’ and ‘Distrust’, which we introduce below. The groups of SRs, SKs and INTs are asked to indicate how strongly they agree with several reasons for which they do not invest more strongly in sustainable investments now or within the next three years. CONVs are asked to indicate how strongly they agree with several reasons for which they do not invest in sustainable investments. The exact formulations are reported in Appendix B.

Table 3 Information sources used by investor groups before investing in a financial product

Information source	Share of all investors in %	Share of SRs in %	Share of SKs in %	Share of INTs in %	Share of CONVs in %
Relevant websites	52.31	60.55	36.14	59.68	48.48
Bank advisor	49.19	45.87	45.78	50.81	49.86
Talk to friends or relatives	40.82	44.95	46.99	41.53	37.67
Relevant magazines	28.59	46.79	15.66	34.27	22.16
Magazine of the Stiftung Warentest ⁴	24.22	28.44	21.69	31.85	18.28
Newspapers	20.35	31.19	16.87	21.77	16.90
Other advisor	16.98	22.02	28.92	19.76	10.80
Consumer advice center	6.99	11.93	9.64	7.66	4.43
Other information sources	2.87	7.34	1.20	1.21	3.05

This table reports which percentage share of all investors, SRs, SKs, INTs, and CONVs use the specific information sources reported above before they invest in a financial product. The results are reported in decreasing order for the category of all investors. The respondents could make a multiple selection out of the nine different categories presented in the table and a no-choice option

⁴Stiftung Warentest is an independent foundation under civil law which was founded by the German Parliament in 1964. Its main task is to test products and services in cooperation with independent research institutes and to publish these results, for example, in their own magazine

Schrader (2006) as well as Paetzold and Busch (2014) argue that banks perform badly with respect to advisements or the provision of information on SRI. Therefore, we assume that a lack of intermediation and advisements by banks might severely prevent investors from SRI as the investors' information costs (and thus their participation costs) are too high for market participation.

Therefore, we asked the respondents to indicate how strongly they agree with the statement "My bank has not offered me sustainable investments yet." as reason why they do not invest (more strongly) in socially responsible investments (now or within the next three years).¹⁹ The resulting dummy variable, 'No offer by bank' takes the value one if the respondent strongly agreed with this statement (and zero otherwise), which occurs in 62.11% of all cases. Thus, we see that more than 60% of the respondents indicate that feeling poorly informed about SRI and missing offers by banks are reasons why they do not invest (more strongly) in a socially responsible manner.

We further expect that distrust is another important barrier preventing individual investors from SRI, as they cannot, without any further external information, directly assess whether the information on the financial product's degree of social responsibility published by the provider are true. Indeed, trust is positively related to many economic or financial behaviors (e.g. Falk et al. 2016), such as stock market participation (e.g. Georgarakos and Pasini 2011; Guiso et al. 2008). In the context

¹⁹ Again, we use slightly different formulations for the different investor groups, as reported in Appendix C.

of SRI, Nilsson (2008) as well as Wins and Zwergel (2016) examine the influence of individuals' trust related to SRI based on survey data. Both studies conclude that trusting investors are more likely to invest a part of their portfolio in socially responsible investments. Consequently, we assume that distrust negatively affects the probability to conduct SRI.

We build on the questions used by Guiso et al. (2008) and Nilsson (2008) that capture personalized trust with respect to a bank, broker, or fund provider and asked the respondents how strongly they agree with the statement "I do not trust that providers of sustainable investments follow the sustainability guidelines they publish in their investment information." as reason why they do not invest (more strongly) in socially responsible investments (now or within the next three years).²⁰ The corresponding dummy variable 'Distrust' takes the value one if the respondent strongly agreed with this statement and zero otherwise. It seems that the presence of distrust as reason for not investing (more strongly) in socially responsible investments is not as severe as perceived information deficits, because only 37.87% of the respondents strongly agree with this statement.

Besides information costs, we also consider the individual investors' perception regarding the relative financial performance and transaction costs of SRI compared to conventional investing. While several reviews (e.g. von Wallis and Klein 2015) and meta analyses (e.g. Friede et al. 2015; Rathner 2013) summarize that in most cases socially responsible funds perform better than or equal to conventional funds, research has yet not fully resolved the question of whether or not socially responsible and conventional investments perform differently.²¹ In line with De Bondt (1998) and Nilsson (2008), we argue that individual investors are not necessarily guided by the objective but by the perceived performance of (socially responsible) investment products. Indeed, Nilsson (2008) finds that investors are significantly more likely to invest a larger share of their portfolio in a socially responsible manner when they expect similar or above average returns compared to conventional investments. In contrast, Wins and Zwergel (2016), who construct the same variables, find no significant effects. Both studies also find no significant effects of the perceived risk of SRI compared to conventional investing. Results of other studies in this context also suggest that these variables play only a minor role (e.g. Bauer and Smeets 2015; Riedl and Smeets 2017).

Nevertheless, in order to mitigate omitted variables bias, we aim to capture the individual investors' expectations and perceptions with respect to the return and risk of SRI compared to conventional investing by using similar questions as previous studies (e.g. Nilsson 2008; Bauer and Smeets 2015). To this end, we asked the respondents to state on a symmetric scale with five ordered response categories whether they think that the average return or risk of socially responsible investments

²⁰ Again, we use slightly different formulations for the different investor groups, as reported in Appendix C.

²¹ There is also a discussion on whether certain investors are even willing to sacrifice return in order to invest socially responsibly. Dorfleitner and Utz (2014) report that less financial return conscious investors invest larger amounts of their portfolio in a socially responsible manner. This is in line with other studies, which empirically find that SR investors are willing to sacrifice return for SRI (e.g. Gutsche and Ziegler 2019; Lewis and Mackenzie 2000).

is “much lower”, “rather lower”, “neither higher nor lower”, “rather higher”, or “much higher” compared to conventional investments, respectively. On this basis, we construct two dummy variables. ‘Lower return’ takes the value one if the respondent perceived the rate or return of socially responsible investments as “much lower” or “rather lower” than the return of conventional investments. The dummy variables ‘Higher risk’ takes the value one if the respondent perceived the risk of socially responsible investments as “rather higher” or “much higher” compared to the risk of conventional ones. Table 2 shows that 58.98% of the respondents expect lower returns and 33.08% perceive the risk of socially responsible investments to be lower compared to conventional investments, respectively. That is, a considerable share of individual investors expects socially responsible investments to perform worse than conventional investments, which supports the severe information deficit, as discussed above.

Finally, Vissing-Jorgensen (2004) argues that transaction costs are a potential barrier for stock market participation. As intensive screening processes for SRI could lead to higher management costs, investors might expect that they have to pay higher fees for socially responsible investment products. However, previous surveys ask socially responsible investors about the general importance of fees with respect to their investment decision (e.g. Pérez-Gladish et al. 2012; Wins and Zwergel 2016), but not about their perception of fees for socially responsible compared to conventional investments.

Hence, we used the same symmetric scale as in the case of returns or risk and asked the respondents to indicate whether the average fees of socially responsible investments are “much lower”, “rather lower”, “neither higher nor lower”, “rather higher”, or “much higher” compared to conventional investments. The dummy variable ‘Higher fees’ takes the value one if the respondent selected “rather higher” or “much higher”. Similar to the results regarding risk, about one third of the respondents perceives fees for SRI as higher than for conventional investing.

We also consider the respondents’ age, gender, and degree of education²² as control variables in the microeconomic analysis. The variable ‘Age’ captures the individuals’ age measured in years, the dummy variable ‘Female’ takes the value one if the respondent was a woman (and zero otherwise), and the dummy variable ‘University degree’ takes the value one if respondent had at least a university degree. The average age of the investors is 44.71 years, 43.95% of the investors are female, and about 38% have at least a university degree.

²² Especially the degree of education could play an important role as previous studies argue that education has a positive effect on being invested in stocks, because highly educated people face lower information costs than people with a lower education (e.g. Campbell 2006). In the context of SRI, for example, Bauer and Smeets (2015) find that investors with a university degree invest significantly more at banks specialized on SRI and hold fewer conventional savings accounts. Nilsson (2008) shows that better educated investors are more willing to invest higher proportions of their portfolio in socially responsible funds. In their surveys, Rosen et al. (1991), Tippet and Leung (2001), and Cheah et al. (2011) all find a positive link between the educational level of the respondents and the involvement in SRI. Thus, we expect a positive relationship between the degree of education and the probability to invest in a socially responsible manner.

Table 4 Exemplary choice set

Please indicate which of the following four equity funds appears so attractive for you that you would most likely purchase it

Attribute	Equity fund A	Equity fund B	Equity fund C	Equity fund D
Value of the subscription fee	3.00%	5.00%	5.00%	4.00%
Net return in the last year	4.00%	8.00%	7.00%	5.00%
Average annual net return in the last five years	3.00%	7.00%	5.00%	9.00%
Sustainability criteria	Consideration without sustainability certificate	No consideration	Consideration with sustainability certificate	No consideration
Transparency logo	Transparency logo issued by the state	No transparency logo	Transparency logo issued by an NGO	Transparency logo issued by an NGO

This table reports an exemplary choice set for the choice among the four equity funds A to D, which only differ with respect to the five different attributes “value of the subscription fee”, “net return in the last year”, “average annual net return in the last five years”, “sustainability criteria”, and “transparency logo”. The different attribute levels are reported in Table 5

3.2 Experimental Design and Variables

In the (unlabeled)²³ SC experiment, each respondent was asked to make eight successive (hypothetical) investment decisions.²⁴ In each decision, the respondent had to select one out of four different equity funds that differed with respect to some financial and non-financial attributes, which we describe in detail below. An exemplary choice situation, a so-called choice set, is presented in Table 4.

We implemented this approach as it allows us to collect data on (hypothetical) investment decisions and merge them with the individuals’ perceptions about information costs and the relative financial performance of socially responsible investments compared to conventional investments. Thus, we are able disentangle determinants of (not) considering specific attributes in investment decisions, which is only hardly possible on the basis of pure market data (see e.g. the fund flow analyses conducted by Benson and Humphrey 2008 or Bollen 2007). Moreover, it addresses some well-known problems of pure survey approaches. For example, answers of individual investors to direct questions about the attributes they prefer most when they make investment decisions or they considered in their last investment decision are often

²³ That is, the four different alternatives were labeled by four generic names, i.e. the names contained no further information about the properties of the funds.

²⁴ This means that the respondents have not been incentivized beyond the standard incentive for participating in this survey. This procedure is in line with other studies applying SC experiments in the context of investment decisions in general (e.g. Wilcox 2003) or in the context of SRI (e.g. Hartzmark and Sussman 2019; Nakai et al. 2018).

Table 5 Attributes and attribute levels in the discrete choice experiment

Attributes	Attribute levels
Value of the subscription fee	3.00%, 4.00%, 5.00%
Net return in the last year	4.00%, 5.00%, 6.00%, 7.00%, 8.00%
Average annual net return in the last five years	3.00%, 5.00%, 6.00%, 7.00%, 9.00%
Sustainability criteria	No consideration, consideration without sustainability certificate, consideration with sustainability certificate
Transparency logo	No transparency logo, transparency logo issued by an NGO, transparency logo issued by the state

This table reports the attributes and their levels used to define the different equity funds. In order to increase the practical relevance of the SC experiment and the validity of the empirical results, the selection was based on consultations with practitioners before the survey. Furthermore, the range of the three financial attributes were based on common values during the time of the survey at the end of 2013

prone to conscious or unconscious errors, such as social desirability, retrospection, or recall biases (e.g. Boyle et al. 2015; Mason and Stark 2004).²⁵

At the beginning of the experiment, every participant received a detailed description of the experimental setting (see Appendix C), which said that they will be shown eight different pages with four different equity funds on each page. The participants were asked to indicate which of the four equity funds they would acquire most likely. Further, they were informed that it is possible that some of the equity funds are currently not provided on the capital market, but they were asked to imagine that these funds are available in reality. Further, they were asked to imagine that all equity funds are totally identical except with regard to the following attributes: the value of the subscription fee, net return in the last year, average annual net return in the last five years, sustainability criteria, and transparency logo. The attributes and their levels, which were carefully chosen based on existing studies and consultations with practitioners, are presented in Table 5.

Thus, we included three financial attributes. The attribute value of the subscription fee can take the values 3.00%, 4.00%, and 5.00%, while the net return in the last year and the average annual net return in the last five years varies between from 4.00% to 8.00% and 3.00% to 9.00%, respectively.²⁶ With respect to the attribute sustainability criteria, we explained that equity funds differ in terms of whether ecological, social, and/or ethical criteria are considered besides financial criteria in their construction process. Sustainable equity funds could additionally be awarded

²⁵ See Hensher et al. (2010) for a discussions of problems of stated preference methods. For a discussion of different methodological approaches to reveal determinants of SRI, and particularly the advantages and limitations of SC experiments, see Gutsche and Ziegler (2019).

²⁶ According to Hoyos (2010), the selection of the attributes and their levels are one critical point for designing SC experiments. Particularly, the omission of key attributes, i.e. those attributes which are important for the majority of the respondents, should be avoided. In the context of investment decisions, it is therefore key to include financial attributes, even though we are rather interested in eliciting the preferences for sustainability and transparency labels. Thus, we followed procedures outlined in previous overviews (e.g. Hoyos 2010) or applications (see e.g. Bergmann et al. (2006) in the field of energy economics, Achtnicht et al. (2012) in the field of transportation economics) and selected the attributes on the basis of interviews with market experts, focus groups, and results from previous studies. Final pilot tests gave us the impression that we have included adequate attributes and attribute levels.

with a sustainability certificate indicating that an independent organization audited and confirmed the consideration of sustainability criteria. Finally, the equity funds differed in terms of whether they received a transparency logo. A transparency logo could be provided by the state or an NGO and indicates that extensive information on each investment strategy (also including the sustainability criteria if appropriate) was published.

The final experimental design was generated by GfK SE with Sawtooth Software. We used a “balanced overlap” design in order to keep both the statistical efficiency as well as the precision of estimates of interaction terms at an acceptable level (e.g. Chrzan and Orme 2000). In total, 50 different versions of randomized choice sets were created and assigned to the respondents. We conducted pretests among graduate students and the first 50 respondents of the survey thereby ensuring that the SC experiment’s description and the decision tasks were easily comprehensible. Additionally, in order to mitigate hypothetical bias, we included an understanding question, i.e. asked each respondent after the SC experiments whether they found the choice sets and the description of the choice sets comprehensible. Further, we made use of certainty scales (e.g. Fifer et al. 2014) and asked the respondents subsequent to each decision whether they would indeed purchase the chosen equity fund in case of a real investment decision. Based on these answers, we are able to create subsamples and conduct a variety of robustness checks, which we describe in Sect. 4.3.

For the econometric analyses described in Sect. 4.2 that analyzes the individual preferences regarding sustainability certificates and transparency logos, we construct a dependent variable that captures the choice among the four different equity funds. Further, we create explanatory variables based on the four attributes. The three explanatory variables for the financial attributes are treated as continuous variables. With respect to the variables of main interest, we further construct the dummy variables that refer to the different attribute levels. For the attribute sustainability criteria, we construct the dummy variables ‘Conventional fund’, ‘Consideration of sustainability criteria without certificate’, and ‘Consideration of sustainability criteria with certificate’. Finally, the dummy variable ‘Transparency logo’ takes the value one if the equity fund was labeled by a transparency logo (either by the state or an NGO), and zero otherwise.

In order to analyze to what extent the preferences for the sustainability certificate and the transparency logo vary across investor groups, we construct the three additional dummy variables ‘SRs’, ‘SKs’, and ‘INTs’ that take the value one if the respondent belongs to the corresponding group, respectively,²⁷ and interact these variables with ‘Consideration of sustainability criteria with certificate’ and ‘Transparency logo’, respectively. We further construct interaction terms between the latter two variables and all explanatory variables shown in Table 2 (i.e. we construct $2 \times 11 = 22$ interaction terms), in order to analyze whether the stated preferences for these labels vary across different investment barriers.

²⁷ That is, CONVs represent the reference category.

4 Empirical Results

4.1 Analysis of Investment Barriers for Individual Investors

4.1.1 Bivariate Analysis

In order to get a first impression to what extent different investor types face different investment barriers, we start with a bivariate analysis. To this end, we compare the four investor groups with respect to their responses regarding the potential investment barriers.²⁸ Fig. 1 illustrates the differences across the four investor groups with respect to the dummy variables used to capture factors related to information costs.

More than one third of the SRs strongly agreed with the statement “I feel poorly informed about sustainable investments.” as a reason why they do not invest more money in socially responsible investments. However, this share is still small compared to the shares in the other groups, which is confirmed by the corresponding t-tests. Indeed, more than half of all SKs and considerably more than 60% of the INTs or CONVs, respectively, strongly agree that feeling poorly informed about sustainable investments is a reason why they do not invest (more strongly) in socially responsible investments. The results with respect to ‘Too little knowledge’ are quite similar. However, the share of respondents agreeing to the related statement is smaller for every group and there is a clear increasing trend from about 18% for SRs to about 60% for CONVs, i.e. the share of investors that self-assess their knowledge of SRI as too low is largest among CONVs. The results for ‘No offer by bank’ reveal that slightly more than 40% of the SRs or SKs, respectively, strongly agree that not having received an offer for a socially responsible investment product by their bank yet is a reason for not investing (more strongly) in socially responsible investments. The shares among INTs and CONVs even amount to about 73% and 65%, respectively. This result is impressive given that still approximately 50% of INTs and CONVs state that they consult their bank advisor before they invest in a financial product (see Table 3). In contrast to the variables before, the proportions among SRs and SKs, i.e. respondents that are currently invested in socially responsible investment products, are not significantly different from each other. However, there seems to be a large discrepancy between already invested and not (yet) invested investors. The results for ‘Distrust’ show a somewhat different pattern. Again two groups emerge, but the percentages for those who strongly agree with the statement that providers of socially responsible investment products do not follow the sustainability guidelines they represent in the investment information as reason for not investing (more strongly) in socially responsible investments is similar for future potential investors (i.e. SRs and INTs) and those who are not planning to invest in

²⁸ Respondents that selected the no-choice for the respective question are excluded from this analysis. We further conducted t-tests in order to draw pairwise comparisons between the four investor groups with respect to all information and financial performance related variables according to the categorization in Table 2. In addition, we also conducted chi-squared tests of independence for testing on stochastic dependency between the investor groups and each dummy variable. The results are not reported due to brevity, but are available upon request.

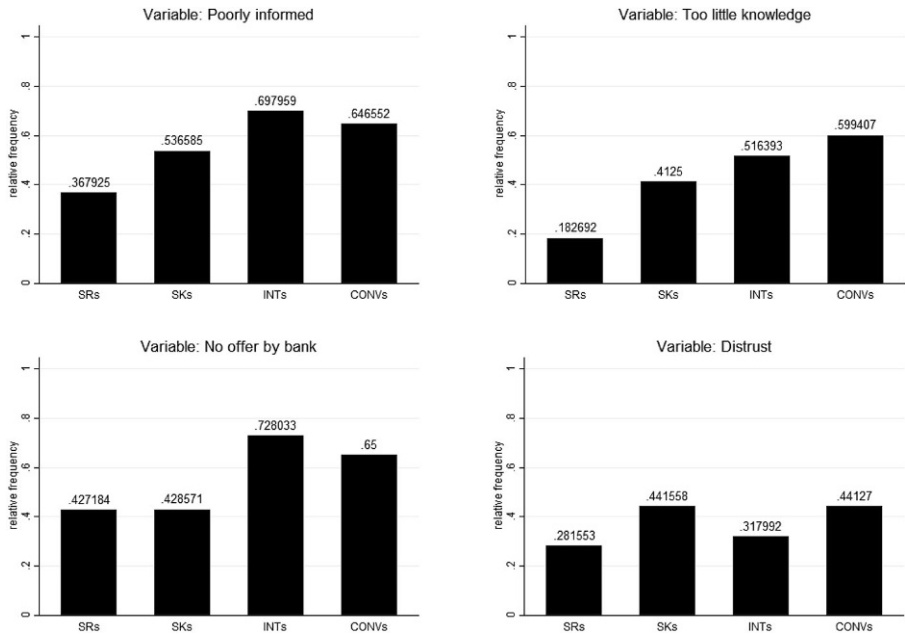


Fig. 1 Perceived information costs across investor groups. These graphs report the relative frequencies of the variables capturing perceived information costs for the four different investor groups. The number of absolute observations varies across the different variables due to missing values. The graph for ‘Too little knowledge’ is based on answers of 104 SRs, 80 SKs, 244 INTs, and 337 CONVs. Thus, 5 SRs, 3 SKs, 4 INTs, and 24 CONVs refused to answer this question. The respective number of valid answers and missing values for the other variables are as follows: ‘Poorly informed’: SRs (106/3), SKs (82/1), INTs (245/3), CONVs (348/13); ‘No offer by bank’: SRs (103/6), SKs (77/6), INTs (239/9), CONVs (320/41); ‘Distrust’: SRs (103/6), SKs (77/6), INTs (238/9), CONVs (315/46)

a socially responsible manner in the future (i.e. SKs and CONVs), respectively.²⁹ The share amounts to about 30% for the former group and about 44% for the latter group, which shows that the share of respondents that do not invest (more strongly) in socially responsible investments because they do not trust the information published by providers is not negligible.

Fig. 2 illustrates the relative frequencies for the variables capturing the perceived financial performance and transaction costs of socially responsible compared to conventional investments. Almost 50% of the SRs and even over 50% of the SKs, INTs, and CONVs, respectively, perceive the return of socially responsible investments to be lower compared to conventional investments. Concerning ‘Higher risk’, the percentage of SRs (19.6%) is significantly lower than the respective percentages of the other three investor groups. With respect to ‘Higher fees’, we see that about one quarter of those who are currently invested in socially responsible investments (i.e. SRs and SKs) think that fees of socially responsible investment are higher than that

²⁹ The corresponding t-tests support this result, i.e. we find no statistically significant difference between the share of SRs and INTs or SKs and CONVs, respectively. However, we find significant differences between these groups, i.e. for example between SRs and SKs or INTs and CONVs, respectively.

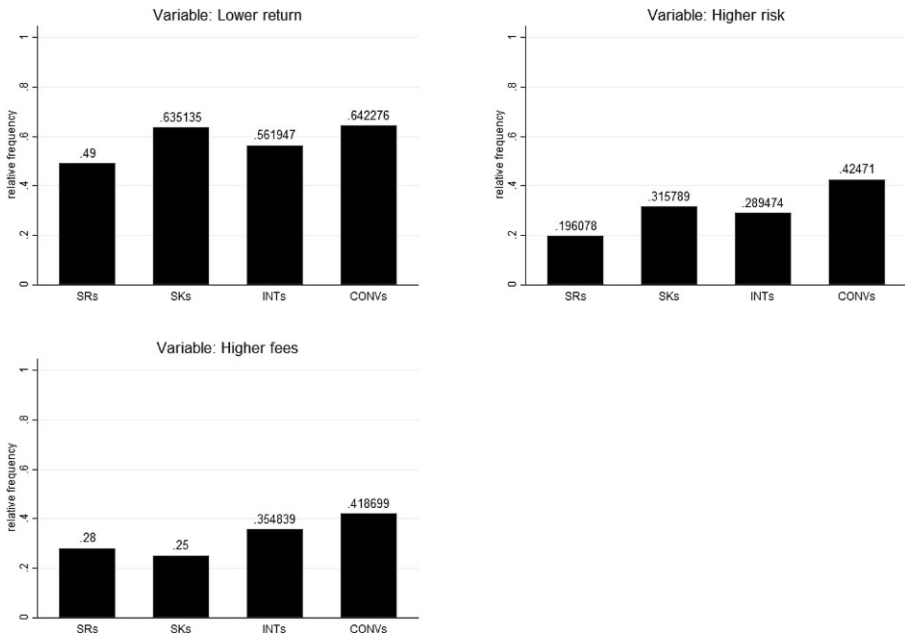


Fig. 2 Perceived (relative) financial performance and transaction costs of SRI compared to conventional investments across investor groups. These graphs report the relative frequencies of the variables capturing the perceived financial performance and transactions costs of socially responsible compared to conventional investments for the four different investor groups. The number of absolute observations varies across the different variables due to missing values. The graph for ‘Lower return’ is based on answers of 100 SRs, 74 SKs, 226 INTs, and 246 CONVs. Thus, 9 SRs, 9 SKs, 22 INTs, and 115 CONVs refused to answer this question. The respective number of valid answers and missing values for the other variables are as follows: ‘Higher risk’: SRs (102/7), SKs (76/7), INTs (228/20), CONVs (259/102); ‘Higher fees’: SRs (100/9), SKs (72/11), INTs (217/31), CONVs (246/115)

of conventional investments, whereas around 40% of those who are currently not invested in a socially responsible manner have this opinion. These values show that a considerable share of all investor groups perceive socially responsible investments to perform worse than conventional investments in terms of returns, but simultaneously the majority also does not expect higher risks, which indicates rather rational expectations.³⁰

In summary, the results of the bivariate analyses clearly support our first hypothesis. We see that SR investors have the highest level of knowledge compared to the other three investor groups. Further, a smaller share of SRs strongly agrees that the feeling of being poorly informed about SRI and distrust with respect to the information offered by the providers of socially responsible investments are reasons why they do not invest more in a socially responsible manner. They also perceive the financial performance of socially responsible compared to conventional investment products slightly more positive than the other investors, though they also tend to

³⁰ The data show that only about 20% of all respondents expect lower returns and higher risks at the same time.

perceive that socially responsible investments have lower returns than conventional ones. The other end of the spectrum is marked by the CONVs. Compared to the other three investor groups, CONVs have the lowest level of knowledge, second highest level of distrust, and have the second lowest level with respect to ‘Poorly informed’ (after INTs). Furthermore, they exhibit the highest level regarding ‘Higher risk’ and ‘Higher fees’. SKs are a kind of hybrid of the other investor groups as they are similar to SRs regarding ‘No offer by bank’ and ‘Higher Fees’, but more like INTs regarding ‘Too little knowledge’, ‘Lower return’, and ‘Higher risk’, and more like CONVs with respect to ‘Distrust’ and ‘Poorly informed’. INTs most strongly differ from SRs and SKs with respect to ‘No offer by bank’. The feeling of being poorly informed about SRI is also a more important reason for them why they do not invest in a socially responsible manner compared to the former two groups. They are less knowledgeable, especially compared to SRs. Thus, having too little information on SRI seems to be the key barrier preventing them to invest in socially responsible investment products.

4.1.2 Estimation Results of Multivariate Analysis

As the dependent variable ‘Investor type’ takes four different values on a nominal scale, we apply multinomial logit models (e.g. McFadden 1973) in order to identify the importance of the various potential barriers on the membership in the different investor groups. The parameters are estimated by using the maximum likelihood (ML) method. Table 6 reports the estimated average marginal and discrete probability effects with respect to the four different investor groups.

In line with our expectations, the estimation results reveal a highly statistically significant negative relationship between too little knowledge of SRI and the probability to be an SR. The estimated average discrete probability effect amounts to –13.5 percentage points³¹, which is larger compared to all other estimated discrete probability effects for this group, respectively. In contrast, the estimated probability for belonging to the group of CONVs is 18 percentage points larger if a respondent assesses their knowledge of SRI as too little. This supports our explanation that investors with only little knowledge of SRI face higher information costs in terms of, for example, time spent for processing information on SRI than more sophisticated investors, and hence are less likely to invest socially responsibly. We find no significant effect of ‘Too little knowledge’ for the two remaining groups.

Our expectations are further supported by the finding that an increasing number of information sources has a significantly positive effect on the membership in the group of SRs or INTs, and thus on being a potential future socially responsible investor. In contrast, we see that an increase of the number of self-reported information sources by one decreases the estimated probability for being an SK by approximately 2.6 percentage points and even by approximately 3.8 percentage points for being a CONV.

The perception of feeling poorly informed about SRI as reason for no (further) socially responsible investments is significantly positively related to belonging to the

³¹ In this case and for all further interpretations, we assume that all other factors are held fixed.

Table 6 Estimates (robust standard errors) of average marginal and discrete probability effects for investor group membership

Explanatory variables	SRs	SKs	INTs	CONVs
<i>Perceived information costs</i>				
Too little knowledge	-0.135*** (0.035)	0.004 (0.034)	-0.049 (0.048)	0.180*** (0.047)
Number of information sources	0.031*** (0.011)	-0.026** (0.012)	0.032** (0.015)	-0.038** (0.016)
Poorly informed	-0.048 (0.035)	0.000 (0.033)	0.116** (0.046)	-0.068 (0.046)
No offer by bank	-0.080** (0.034)	-0.132*** (0.036)	0.158*** (0.044)	0.053 (0.045)
Distrust	0.012 (0.036)	0.080** (0.033)	-0.174*** (0.042)	0.082* (0.044)
<i>Perceived (relative) financial performance</i>				
Lower return	-0.016 (0.032)	0.028 (0.029)	-0.060 (0.043)	0.048 (0.041)
Higher risk	-0.082*** (0.031)	-0.026 (0.030)	-0.049 (0.044)	0.156*** (0.044)
<i>Perceived (relative) transaction costs</i>				
Higher fees	-0.036 (0.034)	-0.052* (0.030)	0.052 (0.045)	0.037 (0.043)
<i>Sociodemographic variables</i>				
Age	0.001 (0.001)	-0.001 (0.001)	-0.003** (0.002)	0.003** (0.002)
Female	0.014 (0.034)	0.049* (0.029)	-0.067 (0.043)	0.005 (0.041)
University degree	0.083*** (0.032)	-0.012 (0.027)	-0.015 (0.042)	-0.055 (0.040)

This table reports the estimated average marginal and discrete probability effects based on ML parameter estimates in a multinomial logit model, dependent variable: 'Investor type' that takes the value one if the respondent is currently invested in socially responsible investments and plans to invest in socially responsible investments in the future (= SRs or socially responsible investors), two if the respondent is currently invested in socially responsible investments and does not plan to invest in socially responsible investments in the future (= SKs or skeptical investors), three if the respondent is currently not invested in socially responsible investments and plans to invest in socially responsible investments in the future (= INTs or interested investors), and four if the respondent is currently not invested in socially responsible investments and does not plan to invest in socially responsible investments in the future (= CONVs or conventional investor), number of observations = 530

*** (**, *) means that the corresponding estimated probability effects are significantly different from zero on a 1% (5%, 10%) significance level

group of INTs and the corresponding estimated probability effect amounts to 11.6 percentage points. We find no evidence that this variable significantly affects the group membership of any other group. However, this result suggests that especially INTs have not reached a degree of information that makes them feel sufficiently comfortable to invest in socially responsible investments.

This interpretation is supported by our finding regarding 'No offer by bank' that shows that this variable increases the estimated probability for being an INT by approximately 15.8 percentage points. Thus, especially individual investors from this

group are obviously confronted with too high information costs and demand more information as well as support from banks. The pivotal role of banks for investors that have not entered the market yet is further underlined by the significantly negative effects on the membership in the group of SRs and SKs. That is, investors that have once overcome the initial entry hurdle are significantly less affected by this potential barrier. This is partly also reflected by the share of people consulting the bank advisor before they make an investment, which is largest among INTs (see Table 3).

Distrust as a reason for no (further) socially responsible investments seems to play a severe role among SKs, INTs, and CONVs, as ‘Distrust’ significantly positively affects the probability for belonging to a group of investors that does not plan to invest socially responsibly in the future, i.e. SKs and CONVs, and significantly negatively affects the probability to belong to the group of INTs. Hence, distrust is not only a reason why CONVs do not plan to invest in a socially responsible manner, but also an explanation why some individual investors plan to withdraw from SRI.

In contrast to factors that influence the individual information and search costs, we only find weak evidence for an impact of the perceived financial performance and transaction costs on investor group membership. In case of ‘Lower return’ we find no significant effect on the membership to any of these groups. Similarly, ‘Higher fees’ seem to play a minor role, as we only find a weak significant and negative effect on the probability to belong to the group of SKs. Only the perception that socially responsible investments are riskier than conventional investments significantly negatively affects the probability of belonging to the group of SRs, while it has a significant positive effect on the affiliation to the group of CONVs. However, this is in line with previous empirical studies that also find few significant effects of these variable in multivariate regression approaches (e.g. Nilsson 2008; Wins and Zwergel 2016).

Also in line with previous studies, we only find weak statistical evidence for effects of sociodemographic variables. The results suggest that age positively affects the membership in the group of CONVs and a negative effect on being an INT, females are more likely in the group of SKs, and having a university degree significantly positively affects the affiliation to the group of SRs.³²

The results of the multivariate analysis above support our first hypothesis. In sum, SRs tend to be more sophisticated and better informed about SRI but also about financial products in general. Hence, they face lower information costs than other investor groups. Especially INTs are less likely invested in a socially responsible manner if they feel poorly informed about SRI and if they received no offer by their bank. Therefore, the barriers for INTs investors could potentially be reduced by targeted information disclosure about SRI and direct offers by banks. Further, SKs and CONVs seem to distrust providers of socially responsible investment products,

³² As reaction to very valuable comments from an anonymous reviewer, we also considered model specifications that controlled for further potential drivers, such as political orientation, expectations of peers, environmental awareness, and general interest in SRI. Nevertheless, our main results reported in Table 6 remain stable, as described in Sect. 4.3.

which in turn prevents them from (future) socially responsible investments. However, both investor groups seem to be also generally worse informed about financial investment products, which leads to the idea that also trustworthy information disclosure about SRI might enhance their willingness to invest in a socially responsible manner.

4.2 The Impact of Labels On Investment Decisions

4.2.1 Econometric Approach

For the analysis of the relevance of the attributes, and especially of the sustainability certificate and transparency logo, for the choice among the four equity funds in the SC experiment, we refer to multinomial discrete choice models that are based on random utility maximization theory (e.g. McFadden 1973). Accordingly, we assume that respondent i ($i = 1, \dots, 801$) chooses an equity fund j ($j = 1, \dots, 4$) in a specific choice set m ($m = 1, \dots, 8$) if the utility for this alternative is the largest among the utilities for all four alternatives. The utility of respondent i for equity fund j in choice set m is: $U_{ijm} = \beta_i'x_{ijm} + \varepsilon_{ijm}$.

The vector $x_{ijm} = (x_{ijm1}, \dots, x_{ijmK})'$ comprises the explanatory variables that are based on the attributes and individual characteristics. The vector $\beta_i = (\beta_{i1}, \dots, \beta_{iK})'$ contains the unknown parameters that have to be estimated. The error terms ε_{ijm} summarize all unobserved factors for the choice of an equity fund. In the following analyses, we specify several models with a different number of explanatory variables, i.e. the dimension K of the parameter vectors varies across different model specifications. For example, we begin with basic model specifications that only include explanatory variables for the different attributes (see Table 7). We further consider model specifications that include the interactions terms, which we defined in Sect. 3.2., in order to analyze to what extent the preferences for a sustainability certificate or a transparency logo vary across investor groups (see Table 8) or potential investment barriers (Table 9). We further do not include alternative-specific constants as it is common in econometric analyses with data from unlabeled SC experiments (e.g. Goett et al. 2000; Hensher et al. 2005).

As multinomial logit models are mostly not appropriate for the analysis of SC experiments (e.g. Hoyos 2010), we consider mixed logit models (e.g. Hensher and Greene 2003), which still assume independently and standard (type 1) extreme value distributed error terms ε_{ijm} , but are not based on the restrictive IIA assumption and allow for taste heterogeneity among the participants. Mixed logit models assume that the (random) parameters β_{ik} ($i = 1, \dots, 801$) of the explanatory variables are continuously distributed across i (e.g. Greene 2012) and we further assume that they are normally distributed. Thus, in contrast to the application of multinomial logit models, where only one parameter per explanatory variable is estimated, this approach leads to the estimation of the mean and the additional estimation of the standard deviation for each random parameter. In contrast, it is common practice to assume that the parameters of interaction terms are fixed (e.g. Goett et al. 2000; Hensher et al. 2005) and thus only one parameter per interaction term is estimated, as in the case of multinomial probit models. We use the Stata command “mixlogit”

Table 7 Basic SML estimation results in mixed logit models for the choice among four equity funds

Explanatory variables	All	SRs	SKs	INTs	CONVs
<i>Mean of the parameters (robust standard errors)</i>					
Net return in the last year	0.272*** (0.020)	0.231*** (0.45)	0.149*** (0.050)	0.242*** (0.033)	0.362*** (0.036)
Average annual net return in the last five years	0.513*** (0.026)	0.378*** (0.056)	0.318*** (0.059)	0.455*** (0.042)	0.679*** (0.048)
Value of the subscription fee	-0.279*** (0.034)	-0.196** (0.080)	-0.098 (0.086)	-0.260*** (0.060)	-0.380*** (0.055)
Consideration of sustainability criteria without certificate	-0.658*** (0.061)	-0.832*** (0.197)	-0.571*** (0.141)	-0.735*** (0.107)	-0.571*** (0.094)
Conventional fund	-1.388*** (0.082)	-1.927*** (0.280)	-1.086*** (0.189)	-1.907*** (0.158)	-0.946*** (0.110)
Transparency logo	1.098*** (0.073)	1.297*** (0.186)	0.546*** (0.156)	1.395*** (0.143)	1.030*** (0.110)
<i>Standard deviation of the parameters (robust standard errors)</i>					
Net return in the last year	0.322*** (0.024)	0.208*** (0.073)	0.243*** (0.061)	0.271*** (0.041)	-0.405*** (0.038)
Average annual net return in the last five years	0.489*** (0.024)	0.418*** (0.049)	0.372*** (0.053)	0.433*** (0.042)	0.568*** (0.040)
Subscription fee	0.592*** (0.045)	-0.412*** (0.147)	0.488*** (0.127)	0.603*** (0.085)	-0.668*** (0.064)
Consideration of sustainability criteria without certificate	-0.563*** (0.097)	1.035*** (0.228)	-0.010 (0.037)	-0.519*** (0.165)	0.450*** (0.151)
Conventional fund	1.312*** (0.078)	1.782*** (0.268)	0.822*** (0.184)	1.342*** (0.132)	-1.091*** (0.109)
Transparency logo	1.309*** (0.085)	1.057*** (0.212)	0.764*** (0.205)	1.370*** (0.133)	1.390*** (0.125)
<i>N</i> (observations)	801 (6408)	109 (872)	83 (664)	248 (1984)	361 (2888)

This table reports SML estimates of parameters in mixed logit models, dependent variable: 'Investor choice'. The estimation results in the second column are based on the choice of all 801 respondents (i.e. 6408 observations). The estimation results in the third, fourth, fifth, and sixth column are only based on the choices of the 109 SRs, 83 SKs, 248 INTs, and 361 CONVs, respectively. We used 1000 Halton draws for the SML estimations

*** (**, *) means that the corresponding parameter estimates are significantly different from zero on a 1% (5%, 10%) significance level

written by Hole (2007) for the simulated maximum likelihood (SML) estimation (e.g. Train 2009) of the parameters.³³

4.2.2 Estimation Results

Table 7 reports the basic SML estimation results in mixed logit models for the choice among four equity funds, i.e. we only include the explanatory variables for the attributes and no interactions terms. The estimation results are based on five different subsamples. The estimation results in column two are based on all 801 respondents

³³ Also all other estimations and statistical analyses for this paper were conducted with Stata.

Table 8 SML estimation results in mixed logit models for the choice among four equity funds with interaction terms between label attributes and investor groups

Explanatory variables	Mean of the parameter (robust standard error)	Standard deviation of the parameter (robust standard error)
Net return in the last year	0.280*** (0.020)	0.318*** (0.024)
Average annual net return in the last five years	0.515*** (0.026)	0.483*** (0.024)
Value of the subscription fee	-0.277*** (0.034)	0.610*** (0.045)
Consideration of sustainability criteria without certificate	0.641*** (0.055)	-0.602*** (0.089)
Consideration of sustainability criteria with certificate	0.862*** (0.095)	1.335*** (0.082)
Consideration of sustainability criteria with certificate * SRs	0.819*** (0.231)	–
Consideration of sustainability criteria with certificate * SKs	0.360* (0.207)	–
Consideration of sustainability criteria with certificate * INTs	0.776*** (0.150)	–
Transparency logo	0.969*** (0.101)	1.296*** (0.078)
Transparency logo * SRs	0.404** (0.205)	–
Transparency logo * SKs	-0.254 (0.199)	–
Transparency logo * INTs	0.482*** (0.161)	–
<i>N</i> (observations)	801 (6408)	

This table reports SML estimates of parameters in mixed logit models, dependent variable: ‘Investor choice’. The dummy variables ‘Consideration of sustainability criteria with certificate’ and ‘Transparency label’ are interacted with dummy variables for the different investor groups. We used 1000 Halton draws for the SML estimation

*** (**, *) means that the corresponding parameter estimates are significantly different from zero on a 1% (5%, 10%) significance level

(and thus $801 \times 8 = 6408$ observations), while the results in the other columns are only based on the decisions of SRs (i.e. 109 respondents, 872 observations), SKs (i.e. 83 respondents, 664 observations), INTs (i.e. 248 respondents, 1984 observations), and CONVs (i.e. 361 respondents, 2888 observations), respectively. The upper part of the table reports the estimated means of the random parameters and the lower part reports the estimated standard deviations of the random parameters. The estimated standard deviations of the random parameters must not be confused

Table 9 SML estimation results in mixed logit models for the choice among four equity funds with interaction terms between label attributes and investment barriers for SRI

Explanatory variables	All	SRs	SKs	INTs	CONVs
<i>Mean of the estimated parameters (robust standard errors)</i>					
Net return in the last year	0.264*** (0.024)	0.240*** (0.048)	0.112** (0.051)	0.226*** (0.036)	0.383*** (0.051)
Average annual net return in the last five years	0.509*** (0.029)	0.383*** (0.063)	0.260*** (0.063)	0.455*** (0.045)	0.772*** (0.065)
Value of the subscription fee	-0.317*** (0.042)	-0.150*** (0.083)	-0.070 (0.105)	-0.276*** (0.066)	-0.591*** (0.085)
Consideration of sustainability criteria without certificate	0.746*** (0.070)	0.883*** (0.180)	0.568*** (0.160)	1.038*** (0.116)	0.396*** (0.125)
Consideration of sustainability criteria with certificate	0.497 (0.395)	1.328 (1.076)	-0.908 (0.889)	0.449 (0.546)	-0.031 (0.787)
Consideration of sustainability criteria with certificate * Too little knowledge	-0.692*** (0.197)	-1.646*** (0.599)	-0.268 (0.509)	-0.347 (0.259)	-0.633* (0.324)
Consideration of sustainability criteria with certificate * Number of information sources	0.124* (0.064)	0.413** (0.167)	0.234 (0.193)	-0.140 (0.097)	0.224* (0.115)
Consideration of sustainability criteria with certificate * Poorly informed	0.262 (0.195)	-0.730 (0.519)	0.021 (0.388)	0.113 (0.296)	1.134*** (0.347)
Consideration of sustainability criteria with certificate * No offer by bank	0.399** (0.187)	1.030** (0.493)	0.024 (0.516)	0.919*** (0.277)	-0.237 (0.299)
Consideration of sustainability criteria with certificate * Distrust	-0.513*** (0.176)	-0.494 (0.548)	-0.065 (0.441)	-0.724*** (0.277)	-0.535* (0.282)
Consideration of sustainability criteria with certificate * Lower return	-0.093 (0.166)	0.249 (0.489)	0.257 (0.417)	-0.080 (0.247)	-0.023 (0.294)
Consideration of sustainability criteria with certificate * Higher risk	-0.486*** (0.176)	-1.619*** (0.545)	-0.551 (0.503)	-0.199 (0.261)	-0.282 (0.288)
Consideration of sustainability criteria with certificate * Higher fees	-0.158 (0.168)	-0.495 (0.504)	0.129 (0.374)	-0.429* (0.259)	0.075 (0.271)
Consideration of sustainability criteria with certificate * Age	0.020*** (0.006)	0.002 (0.016)	0.042*** (0.016)	0.028*** (0.010)	0.015 (0.011)
Consideration of sustainability criteria with certificate * Female	0.263 (0.171)	-0.450 (0.472)	-0.159 (0.398)	0.474* (0.265)	0.444 (0.314)
Consideration of sustainability criteria with certificate * University degree	0.017 (0.164)	-0.089 (0.507)	-0.112 (0.342)	0.350 (0.238)	-0.359 (0.293)
Transparency logo	0.457 (0.394)	-0.882 (0.785)	0.707 (1.076)	0.872 (0.632)	0.572 (0.725)
Transparency logo * Too little knowledge	-0.274 (0.195)	-0.385 (0.448)	-0.240 (0.487)	-0.141 (0.337)	-0.224 (0.369)
Transparency logo * Number of information sources	0.073 (0.064)	0.094 (0.131)	0.077 (0.210)	-0.082 (0.110)	0.210* (0.118)

Table 9 (Continued)

Explanatory variables	All	SRs	SKs	INTs	CONVs
Transparency logo * Poorly informed	0.172 (0.202)	-0.078 (0.373)	-0.161 (0.428)	0.394 (0.365)	0.526 (0.396)
Transparency logo * No offer by bank	0.083 (0.192)	-0.356 (0.381)	0.378 (0.564)	0.287 (0.311)	-0.385 (0.339)
Transparency logo * Distrust	-0.171 (0.182)	-0.178 (0.365)	0.015 (0.459)	-0.060 (0.319)	0.196 (0.320)
Transparency logo * Lower return	-0.499*** (0.172)	-0.102 (0.363)	-0.178 (0.456)	-0.662** (0.285)	-0.686* (0.355)
Transparency logo * Higher risk	-0.023 (0.178)	0.615 (0.497)	-0.186 (0.525)	-0.247 (0.305)	-0.003 (0.322)
Transparency logo * Higher fees	0.050 (0.173)	-0.081 (0.395)	-0.069 (0.401)	0.113 (0.299)	-0.007 (0.310)
Transparency logo * Age	0.021*** (0.006)	0.043*** (0.015)	0.010 (0.019)	0.019 (0.012)	0.013 (0.011)
Transparency logo * Female	0.117 (0.174)	0.234 (0.418)	-0.497 (0.400)	-0.165 (0.299)	0.511* (0.303)
Transparency logo * University degree	-0.199 (0.170)	0.277 (0.376)	-0.037 (0.440)	-0.039 (0.279)	-0.855*** (0.293)
<i>Standard deviation of parameters (robust standard errors)</i>					
Net return in the last year	0.276*** (0.028)	0.174* (0.099)	0.163** (0.068)	0.257*** (0.043)	0.381*** (0.058)
Average annual net return in the last five years	0.465*** (0.027)	0.410*** (0.061)	0.334*** (0.054)	0.367*** (0.038)	0.570*** (0.053)
Value of the subscription fee	0.632*** (0.055)	0.387*** (0.132)	0.556*** (0.132)	0.575*** (0.087)	0.782*** (0.100)
Consideration of sustainability criteria without certificate	0.618*** (0.110)	0.983*** (0.197)	0.026 (0.056)	0.473** (0.229)	-0.674*** (0.187)
Consideration of sustainability criteria with certificate	1.316*** (0.105)	1.673*** (0.277)	0.736*** (0.238)	1.077*** (0.154)	1.190*** (0.184)
Transparency logo	1.296*** (0.104)	0.720*** (0.260)	0.954*** (0.267)	1.230*** (0.150)	1.379*** (0.180)
<i>N</i> (observations)	530 (4240)	91 (728)	60 (480)	194 (1552)	185 (1480)

This table reports SML estimates of parameters in mixed logit models, dependent variable: ‘Investor choice’. The estimation results in the second column are based on the choice of all 530 respondents (i.e. 4240 observations). The estimation results in the third, fourth, fifth, and sixth column are only based on the choices of the 91 SRs, 60 SKs, 194 INTs, and 185 CONVs, respectively. We used 1000 Halton draws for the SML estimations

*** (**, *) means that the corresponding parameter estimates are significantly different from zero on a 1% (5%, 10%) significance level

with the estimated (robust) standard errors of the estimated means, which are reported in parentheses.³⁴ Almost all estimated means and standard deviations of the

³⁴ Also note that the sign of the estimated standard deviations of the random parameters is irrelevant, i.e. negative estimates are interpreted as being positive (e.g. Hole 2007).

random parameters are significantly different from zero.³⁵ While the former result shows that almost all attributes significantly affect the investors' choices among the four equity funds, the latter result indicates high unobserved heterogeneity among the respondents, and thus also within every investor group.

The three financial attributes have the expected significant effects on the choice among the four equity funds, i.e. the net return in the last year and the average annual net return in the last five years have significant positive effects, whereas the value of the subscription fee has a significant negative effect. The higher estimated means of random parameters for the average return in the past five years than for the net return of the last year indicate that the respondents put a stronger focus on the mid-term than on the short-term financial performance of equity funds.

With respect to the explanatory variables of main interest, Table 7 reveals for all investor groups negatively estimated means of the random parameters for 'Consideration of sustainability criteria without certificate' as well as 'Conventional fund'. On average, this indicates that individual investors have lower stated preferences for socially responsible equity funds without sustainability certificate or conventional equity funds than for socially responsible equity funds with sustainability certificate. The inclusion of a transparency logo has a highly significant positive effect on the individuals' equity fund choice, i.e. individual investors have higher stated preferences for an equity fund with a transparency logo than for an equity fund without one. This result again applies to all investor groups.

As in the case of multinomial logit models (e.g. Swait and Louviere 1993), it is not possible to directly compare the size of the estimated means of the random parameters across different model specifications or subsamples due to different scale parameters. One solution would be the estimation of mean willingness to pay for sustainability certificates or transparency logos. This, however, is beyond the scope of this paper as we only aim to analyze whether the different investor groups have different stated preferences towards these attributes and whether certificates and/or labels could overcome certain investment barriers.³⁶ Therefore, we use the interaction terms that we defined in Sect. 3.2, which allow us to compare stated preferences across different investor groups as well as potential investment barriers.

Table 8 reports the SML estimation results in the mixed logit model that includes the explanatory variables for the three financial attributes, the consideration of sustainability criteria without certificate, the consideration of sustainability criteria with certificate, and the transparency logo as well as the six interaction terms of the latter two variables and the dummy variables indicating SRs, SKs, and INTs, respectively. For fixed parameters (i.e. the interaction terms) only one value is estimated, whereas for random parameters (i.e. for the variables of the attributes) estimates for the mean and for the standard deviation are reported.

³⁵ With two exceptions for the group of SKs, namely for the means of the random parameters for subscription fees and for the consideration of sustainability criteria without certificate, respectively.

³⁶ For a detailed analysis of the individual investors' willingness to pay (i.e. to sacrifice returns) for the consideration of sustainability criteria and for the implementation of sustainability certificates or transparency logos see the accompanying study by Gutsche and Ziegler (2019).

Table 8 shows that the stated preferences for certified socially responsible equity funds (compared to conventional equity funds) and transparency logos (compared to equity funds that have no transparency logos) vary across investor groups. While we still see that the consideration of sustainability criteria with certificate as well as transparency logos positively affect the choice among the four equity funds for all groups, SRs and INTs have significantly higher stated preferences for these attributes (compared to conventional equity funds or equity funds with no transparency logo, respectively) than CONVs. We only find weak empirical evidence that SKs prefer the consideration of sustainability criteria with certificate over conventional equity funds more than CONVs, but no significant difference with respect to transparency logos. Hence, we see that especially potential future socially responsible investors have significantly positive preferences than CONVs for equity funds with these labels compared to equity funds without these labels. This shows that not only investors that are already active in SRI, i.e. SRs, but also those who have not managed to enter the market yet have positive relative preferences for both types of labels.

To summarize the results reported in Table 7 and 8, we find that both kinds of labels positively influence the investors' investment decisions. Although this result generally holds for all groups, there is obviously heterogeneity across investor groups and we find the highest positive stated preferences for transparency labels as well as for sustainability certificates among SRs and INTs. Hence, particularly investors who plan to invest in socially responsible investments in the future show interest for these labels. This finding is in line with the previous result that these two groups tend to use more information sources before they make an investment. Hence, it seems to be natural that these groups are also more interested in information provided via labels or certificates, which in turn decrease participation costs and therefore increase the likelihood for SRI. Nevertheless, the results suggest that labels could also provide an opportunity to win SKs and CONVs for SRI as they prefer equity funds with these labels over sustainable funds without label and even conventional investments. Thus, in sum, we find empirical support for our second hypothesis.

In a last step, we directly analyze whether investors that state to face certain investment barriers have higher stated preferences for equity funds with labels than their counterparts. Therefore, we consider model specifications that include the same attribute variables as in Table 8 and add the 22 interactions terms between the dummy variables for the two labels and the explanatory variables described in Table 2, as defined in Sect. 3.2.

Table 9 reports the corresponding SML estimation results in mixed logit models for the five different subsamples. Due to missing values, the total number of respondents dropped from 801 to 530 respondents (i.e. from 6408 to 4240 observations), and particularly from 109 to 91 respondents among SRs, from 83 to 60 respondents among SRs, from 248 to 194 respondents among INTs, and from 361 to 185 respondents among CONVs. As in Table 7, the upper part reports the estimated means of the random parameters and the lower part the corresponding estimated standard deviations. Table 9 reveals again that almost all standard deviations of the random parameters are significantly different from zero, which indicates the presence of unobserved heterogeneity and supports the application of mixed logit models instead of conditional logit models. We further see that the general results regarding the

attributes, which are not interacted with other explanatory variables, remain qualitatively the same. That is, the three financial attributes as well as the consideration of sustainability criteria without certificate significantly affect the choice among the four equity funds. In contrast, the estimated means of the random parameters for the consideration of sustainability criteria with certificate as well as for transparency logo are not significantly different from zero in all five (sub-)samples. As the interpretation for these two variables refers to the case that all interaction terms are zero, this result suggests that some of the 11 explanatory variables can explain the estimated strong preferences for sustainability certificates or transparency logos.

The second column in Table 9 further reveals that too little knowledge of SRI has a significant negative effect on the stated preferences for sustainability certificates³⁷, which is obviously driven by the stated preferences for sustainability certificates of SRs and CONVs (see column three and six). We find no significant effects on the stated preferences of SKs or INTs for sustainability certificates. Further, we find no significant effect of too little knowledge of SRI on the stated preferences for transparency logos for any investor group. Our results suggest that a certain degree of knowledge of SRI is required in order to make sustainability certificates work. However, the stated preferences for transparency logos seem not to be affected.

This result is supported by the findings with respect to the stated number of information sources used by the respondents before they make investment decisions. For SRs and CONVs, we again see that the stated number of information sources is significantly positively related to the stated preferences for sustainability certificates. With one exception, we find no further significant effects on the stated preferences for sustainability certificates or transparency logos, respectively. Only for CONVs, the stated number of information sources also have a (weak) significant positive effect on the stated preferences for transparency logos. This suggests that financially literate respondents from the groups of SRs and CONVs who already use several information sources appreciate a sustainability certificate, i.e. a further information source which particularly confirms that an equity fund indeed considers sustainability criteria. We might find no similar significant effects with respect to transparency logos as investors who use several information sources already might perceive their degree of information about the investment strategy as sufficient. It seems as if they just demand a confirmation for issues they already know.

With respect to the feeling of being poorly informed on SRI as reason why the respondents do not invest (more strongly) in a socially responsible manner, we only find a highly significant positive effect on the stated preferences of CONVs for sustainability certificates. However, this result suggests that sustainability certificates might especially decrease the information costs for this specific subgroup of CONVs. Further, this again suggests that sustainability certificates might even help to activate individual investors who actually do not want to invest in socially responsible investments, as already discussed above.

The results regarding ‘No offer by bank’ show that SRs and INTs who indicate that they do not invest (more strongly) in socially responsible investments as their bank has not offered socially responsible investment products to them yet have sig-

³⁷ Please note that conventional equity funds again represent the base category.

nificantly higher stated preferences for sustainability certificates. In all other cases, we find no further significant effects on the stated preferences for sustainability certificates or transparency logos. However, this result indicates that sustainability certificates could especially help individual investors who assessed themselves as future socially responsible investors. Given that particularly INTs represent the largest share of respondents who consult their bank advisor before they make investments (see Table 3) and who strongly agree that their bank has not offered socially responsible investments to them is a reason why they do not invest socially responsibly (see Fig. 1), sustainability certificates could especially lower their entry costs and serve as substitute for banks who do not totally fulfill their role as intermediaries. That is, we again find support for the second hypothesis.

However, we also see that not only a sufficient degree of financial sophistication, but also a certain degree of trust is necessary to make sustainability certificates work. Table 9 reveals that individual investors, who indicate that they do not invest (more strongly) in socially responsible investments because they do not trust that providers of socially responsible investment products indeed follow their own sustainability guidelines, have significantly lower stated preferences for sustainability certificates. These results are driven by individual investors who have not invested in a socially responsible manner yet, i.e. INTs and CONVs. Hence, the results suggest that a sustainability certificate works worse for individual investors with low levels of trust, although it is the intention of sustainability certificates to address particularly this issue. In contrast, it is intuitively comprehensible that we find no significant effect of this variable on the stated preferences for transparency logos, because this logo only indicates that extensive information on each investment strategy was published, but it does not confirm that the providers follow their own sustainability strategies. Thus, our results suggest that distrust is a crucial barrier and that just the introduction of a label might not be sufficient to overcome this barrier. As mentioned by previous studies in other contexts (e.g. Bonroy and Constantatos 2014), a label itself as well as its provider need to be perceived as credible by the individual investors. This depends on several factors, such as the level of awareness or reputation of the provider, and it could require some time until a label is established. In this respect, future research could analyze on the basis of fund flows or experimental data whether the provider of a label has an effect on the demand of investors.

We also find some evidence that the perceived relative financial performance or transaction costs of socially responsible compared to conventional investments affect the stated preferences for sustainability certificates or transparency logos, respectively. For SRs, we find that the perception of higher risks of SRI compared to conventional investing is related to significantly lower stated preferences for sustainability certificates. Similarly, we find for INTs that the perception of higher fees of SRI compared to conventional investing is associated with (weakly) significantly lower stated preferences for sustainability certificates. We also see for INTs and CONVs that the perception of relatively lower returns for SRI compared to conventional investing has a significantly negative effect on the stated preferences for transparency logos. Thus, these results suggest that financial motives play an important role for at least some individual investors. Given the results of the meta analyses mentioned above (e.g. Friede et al. 2015; Rathner 2013), which indicate

that socially responsible funds perform better than or equal to conventional funds in most cases, individual investors seem to need more information not only about the degree of sustainability of socially responsible investments, but also about the relative financial performance of SRI compared to conventional investing in order to make sustainability or transparency labels work.

Finally, we also find some significant effects of socio-demographic control variables on the stated preferences for sustainability certificates or transparency logos. For SKs and INTs, we find that age is significantly positively associated with the stated preferences for sustainability certificates. Age is also significantly positively related to the stated preferences of SRs for transparency logos. For INTs and CONVs, we find that females have significantly positive stated preferences for sustainability certificates and transparency logos, respectively. For CONVs, the results show that the degree of education is negatively related to the stated preferences for transparency logos.

4.3 Robustness Checks

We conducted several further empirical analyses in order to test whether the empirical results reported in Sects. 4.1 and 4.2 are robust across different model specifications and subsamples. The corresponding estimation results are not reported due to brevity, but are available on request.

With respect to estimation results reported in Table 6, one might be concerned that the relationship between low knowledge of SRI and being invested in a socially responsible manner is driven by other (omitted) factors, such as interest in SRI, political orientation, expectations of peers, or environmental awareness. We address the issue by considering several additional model specifications and explanatory variables. First, we include the dummy variable ‘Interest in SRI’.³⁸ We find that ‘Interest in SRI’ is indeed significantly related to membership in the four investor groups. That is, the estimated average probabilities for being in the group of SRs, SKs, or INTs, are significantly higher for persons with a strong or very strong interest in SRI. Moreover, it is significantly less likely that these persons are in the group of CONVs. However, the remaining results remain qualitatively very similar to those reported in Table 6 (i.e. most average marginal or discrete probability estimates are still significantly different from zero and have the same signs). In some cases, the estimates of average discrete probability effects are not significantly different from zero anymore (e.g. for ‘Number of information sources’ & ‘CONVs’, and ‘Higher risk’ & ‘SRs’ or ‘CONVs’, respectively). However, for some variables, we now even find significant average discrete probability effects, which further strengthen our argumentation. For example, we see that poorly informed persons are significantly less likely in the group of SRs. With respect to ‘Too little knowledge’, we see that both the estimated discrete probability effects with respect to SRs and CONVs are still significant different from zero at the 1%-significance level. However, the

³⁸ It takes the value one if a respondent stated to be rather strongly or very strongly interested in sustainable investments (the respondents had to choose among the five ordered categories “very weakly”, “rather weakly”, “neither strongly nor weakly”, “rather strongly”, and “very strongly”).

estimates are slightly lower than before, i.e. -10.7 versus -13.5 percentage points and versus 11.5 versus 18.0 percentage points, respectively. Thus, our results and argumentation hold also after controlling for ‘Interest in SRI’.

In order to address concerns about further (neglected) factors that might drive our results, we add three more variables, namely ‘Affinity to left-wing parties’, ‘Expectation of the social environment’, and ‘Membership in environmental organization’ to capture political views, the impact of peers, and environmental awareness, respectively.³⁹ In this case, we find intuitive signs for the estimated average discrete probability effects of these additional variables. However, it also reveals that our main results remain robust even after controlling for these additional variables. The drawback of these model specification is that the number of observations drop from 530 to 422 due to several missing values, particularly as many respondents refused to reveal their political alignment.

Additionally, we constructed two variables in order to control for the households’ monthly net income and wealth, respectively, which we also obtained from the questionnaire. The dummy variable ‘Income’ takes the value one if the respondent indicated that household’s monthly net income is equal to or larger than 3000 euros. The dummy variable ‘Wealth’ takes the value one if the respondent indicated that the monetary assets⁴⁰ of the household are larger than 50,000 euros. When we include these two variables separately, the number of observations drops from 530 to 439 and 390, respectively, due to missing values. Based on these model specifications, we find no empirical hint that ‘Income’ has an impact on investor group membership, whereas we find that ‘Wealth’ significantly negatively affects the membership in the group of SKs at the 10% significance level.

More importantly, the general patterns identified in Sect. 4.1, particularly with respect to ‘Too little knowledge’, ‘Number of information sources’, ‘Poorly informed’, the perceived relative financial performance, perceived relative transactions costs, and socio-demographic variables, remain robust in both model specifications. Also in both model specifications, we find that ‘No offer by bank’ has a significantly positive effect on the membership in the group of CONVs at the 10% and 5% significance level, respectively. This result supports our interpretation that the initial information costs, i.e. entry costs, are perceived as too high and that banks could improve their role as intermediary. We further find that ‘Female’ has no significant effect

³⁹ The variables are defined as follows: Affinity to left-wing parties = 1 if a respondent is mainly affiliated with the Social Democratic Party of Germany (SPD), Alliance 90/The Greens (Bündnis 90/Die Grünen), or The Left (Die Linke), and zero otherwise. The questionnaire comprised four further important political parties in Germany at the time of the survey besides these three parties and “another party”, i.e. the Christian Democratic Union of Germany (CDU/CSU), the Free Democratic Party (FDP), Alternative for Germany (AfD), and the Pirate Party (Piratenpartei). Expectation of the social environment = 1 if a respondent agreed rather strongly or totally with the statement “my social environment (e.g. family, friends, colleagues) expects me to make sustainable investments”, and zero otherwise. The respondents had to choose among the five ordered categories “totally agree”, “rather weakly agree”, “neither strongly nor weakly agree”, “rather strongly agree”, and “very strongly agree”. Membership in environmental organization = 1 if a respondent is member of a group or organization engaged in the conservation and protection of the environment and nature, and zero otherwise.

⁴⁰ Monetary wealth includes cash and investments in equities, bonds etc., but it excludes non-financial assets like house, car, art etc.

on the membership in the group of SKs in both specifications. Only for the model specification that includes ‘Income’, we see that ‘Lower returns’ now has a significantly positive effect on being an SK at the 10% significance level. With respect to ‘Distrust’, the main findings remain stable, when we control for the households’ monthly net income. However, when we include ‘Wealth’ as explanatory variable, the significance of ‘Distrust’ for SKs and CONVs disappears (the corresponding p -values are 13.6% and 21.7%, respectively). This could either indicate that perceived information costs are more important than the degree of trust or that this subsample is somewhat different compared to other (sub-)samples considered above. However, we still see that the degree of trust is an important issue for INTs.

Besides the multinomial variable, we also constructed two dummy variables, namely ‘Current socially responsible investor’ and ‘Potential socially responsible investor’. The first variable takes the value one if the respondent either belongs to the group of SRs or SKs, and zero otherwise. ‘Potential socially responsible investor’ takes the value one if the respondent is either an SR or INT. The corresponding analyses on the basis of binary probit models reveals that is insufficient to only consider aggregated investor groups, i.e. to combine SRs and SKs, as individuals from these groups might have opposing motives or face different investment barriers, which in turn leads to some counterintuitive results.

With respect to the analysis of the SC experiment data, we included a comprehension as well as a certainty question in order to mitigate hypothetical bias, as already briefly discussed above. In case of the comprehension question, we asked the respondents whether they generally found the choice sets and the description of the choice situations comprehensible. This question led to the exclusion of 128 respondents who indicated that they had comprehension problems. Secondly, we asked the respondents after each choice set to indicate the degree of certainty that they would purchase the chosen investment product in a real investment situation. We again used a symmetric scale with the five ordered response categories “very uncertain”, “rather uncertain”, “neither certain nor uncertain”, “rather certain”, and “very certain” and excluded all respondents that answered “very uncertain” or “rather uncertain” for the robustness checks. Thirdly, we also checked whether the results change if we do not include all eight choice sets for each individual, but, for example, exclude the first and the last two decisions, which is a usual approach to test for fatigue. Finally, we also varied the number of Halton draws used for the SML estimations in the mixed logit models. However, the corresponding SML estimation results in the mixed logit models remained stable over all robustness checks.

5 Conclusion

Given the strong growth of SRI in terms of investment volumes over the past years and their increasing importance in the context of global environmental challenges, but still limited market participation among individual investors, the purpose of this paper is twofold. It first empirically analyzes which barriers prevent individual investors from investing in a socially responsible manner and whether these barriers

vary across different investor groups. Secondly, it examines whether sustainability and transparency labels can help to overcome at least some of these barriers.

We provide empirical evidence on the basis of survey and experimental data from a broad (online) representative sample of German financial decision makers. In order to account for investor heterogeneity, we do not only distinguish between current socially responsible and conventional investors, but identify four different investor groups, namely SRs, SKs, INTs, and CONVs. This allows us to identify a considerable share of potential future socially responsible investors, i.e. SRs and INTs, which amount to about 45%. This result is promising for policymakers and practitioners who aim to foster sustainable development and the active involvement of individual investors in SRI. Moreover, we see indeed that the investor groups face different investment barriers regarding SRI, i.e. to invest (more strongly) in socially responsible investments.

Our empirical results suggest that SRs are generally confronted with lower information costs as they tend to be more sophisticated and better informed about SRI but also about financial products in general. However, too high information costs for SRI are a severe barrier for potential future investors, although they seem to be well informed about financial products in general. Hence, we find clear support for our first hypothesis. Especially banks could help these investors to overcome the entry hurdle. However, banks appear not to fulfill their role as intermediaries. Furthermore, a considerable share of respondents distrusts that providers of socially responsible investments actually follow their own guidelines, which in turn prevents them from (future) socially responsible investments. Although the perceived relative financial performance and transaction costs of SRI compared to conventional investing seem to be less important than information costs, the majority of the respondents, for example, perceive that the returns of SRI are lower than for conventional investing. As this perception cannot be supported by empirical research, individual investors also obviously need more information on this topic. Hence, targeted and trustworthy information disclosure about SRI, for example via labeling schemes, might indeed help to overcome some investment barriers for SRI (as we have hypothesized in the second hypothesis).

Indeed, our empirical results reveal strong stated preferences for sustainability certificates and transparency logos among all investor groups, but especially among SRs and INTs, i.e. potential future socially responsible investors. Thus, our study confirms empirical results of previous studies who show that sustainability labels have a positive effect on the demand for SRI (e.g. Gutsche and Ziegler 2019; Hartzmark and Sussman 2019). However, in addition to these studies we are able to show that labels also could overcome certain investment barriers, which again supports the second hypothesis. First, we show that also SKs and CONVs prefer equity funds with a sustainability certificate over uncertified socially responsible equity funds or conventional equity funds, respectively. Secondly, we reveal that sustainability certificates that confirm the consideration of sustainability criteria are important when individual investors perceive the role of banks as intermediaries as insufficient. Thus, sustainability certificates could provide an opportunity to win investor groups for future SRI. However, we also note that a certain degree of basic knowledge and

trust in providers of socially responsible investments is required before labels work efficiently.

Nevertheless, several open questions for future research remain. First, we and the accompanying study by Gutsche and Ziegler (2019) only analyze stated choice data. Although we apply several measures to mitigate hypothetical bias, as discussed above, analyses of revealed decisions in context of labels for SRI, for example in a field experiment, are an interesting avenue for further research. This would allow to further analyze whether specific information is demanded by individual investors in order to make them sufficiently comfortable to invest in socially responsible manner or if the implementation of a sustainability certificate is enough. Finally, our study focuses only on information costs as investment barriers. However, it is well-known that a variety of psychological and cognitive biases affect individual financial decisions (e.g. Hirshleifer 2015). Thus, given that socially responsible investments are naturally more complex than conventional investments, it is an interesting question whether certain biases are even more severe in this context and thus represent important barriers not only for SRI, but also for sustainable development.

Acknowledgements We gratefully acknowledge constructive comments from participants and reviewers of the Annual conference of the EAERE 2015 (Helsinki, Finland), the DGF conference 2015 (Leipzig, Germany), the SSFII Conference 2015 (Oxford, England), and PRI Academic Network Workshop 2015 (London, England). Particularly, we thank Hans-Martin Henke, Gregor Dorfleitner, and Maximilian Wimmer. We also gratefully thank the Regional Office in Hesse of the Deutsche Bundesbank for supporting the funding of the survey. The Regional Office in Hesse of the Deutsche Bundesbank had no influence on the study design, data collection, analysis and interpretation of data, writing of the study, nor in the decision to submit the article for publication.

Funding The Regional Office in Hesse of the Deutsche Bundesbank supported the funding of the survey, but had no influence on the study design, data collection, analysis and interpretation of data, writing of the study, nor in the decision to submit the article for publication.

Funding Open Access funding provided by Projekt DEAL.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

Conflict of interest G. Gutsche and B. Zwergel declare that they have no competing interests.

Appendix A

Overview of Labels for SRI

In addition to initiatives for asset owners, investment managers, and service providers, like the United Nations-supported Principles for Responsible Investment (UNPRI), there is a growing number of labels for SRI with the objective to help individual investors in their search for a personally suitable socially responsible investment fund. The most basic and most widely employed label is the European Transparency Logo, which is based on the European SRI Transparency Code. It does not impose any quality requirements for a fund to call itself as ‘socially responsible’ it only seeks to enable especially individual investors to understand the policies and practices of socially responsible funds.⁴¹ Until the end of June 2016 more than 700 of all 1138 socially responsible funds in Europe have already committed themselves to this code.⁴² Several other institutions use the European SRI Transparency Code as a mandatory requirement for their own labels.

The Austrian Ecolabel, which is awarded by the Austrian Ministry of Environment, is the oldest label for socially responsible funds in Europe. It was established in 2004. With its requirements it goes beyond those of the European SRI Transparency Code because it does not only demand transparency of the funds but also certain quality standards.⁴³ Likewise, the Novethic SRI Label and the Novethic Green Fund Label are also designed as quality standards.⁴⁴ Apart from these bigger labels, there are labels from Luxflag, Forum Ethibel and the Responsible Investment Association Australasia. In addition, the FNG in corporation with France based Novethic, launched a new label for socially responsible funds in Germany in November 2015. The existence of these labels and logos highlights the relevance of this topic. Table A1 gives an overview of some selected labels.

⁴¹ See Eurosif (2016), European SRI Study 2014. European Sustainable Investment Forum.

⁴² See www.eurosif.org/transparency-code/ (assessed on 09.10.2018).

⁴³ For details see Kornherr, Christian (2012). Österreichisches Umweltzeichen: Nachhaltige Finanzprodukte.

⁴⁴ For details see www.novethic.com/sri-labels.html (assessed on 09.10.2018).

Table A1 Overview of existing SRI fund labels

Label	Year of launch	No. of cert. retail funds in 2018	Labeling body, domicile	Validity	Detailed label criteria publicly available on the internet	Purpose (according to labeling body)
Austrian Eco-label	2004	66	Austrian Federal Ministry of Agriculture, Austria	–	Yes	The label is intended to be used by individual investors as a quality standard. It guarantees systematic integration of ethical, social and ecological criteria into fund management
Certified Responsible Investment	2005	104	Responsible Investment Association Australasia (RIAA), Australia	–	No	Designed to act as a navigational tool, the Symbol helps consumers identify products and services that take environmental, social, ethical or governance issues into account which have been certified by RIAA
Ethibel Excellence Label	2004	4	Forum Ethibel, Belgium	–	Yes	The label indicates that the fund only invests in companies which perform above average within their industry in terms of corporate social responsibility (CSR)
Ethibel Pioneer Label	1991	0	Forum Ethibel, Belgium	–	Yes	The label indicates that the fund only invests in companies which stand out within their industry in terms of corporate social responsibility (CSR)
European SRI Transparency Code	2008	>700	EuroSif, Belgium	–	Yes	It primarily aims at increasing accountability and clarity of SRI practices for European investors. The Code focuses on SRI funds distributed publicly in Europe
FNG Label for sustainable mutual funds	2015	45	FNG, Germany	One year	Yes	Designed to offer a transparent standard for funds which pursue a consistent and rigorous sustainability strategy

Table A1 (Continued)

Label	Year of launch	No. of cert. retail funds in 2018	Labeling body, domicile	Validity	Detailed label criteria publicly available on the internet	Purpose (according to labeling body)
Luxflag Environmental Label	2011	8	LuxFLAG, Luxembourg	One year	Yes	The primary objective is to reassure investors that the Investment Fund actually primarily invest their assets in environment-related sectors in a responsible manner
Luxflag ESG Label	2014	34	LuxFLAG, Luxembourg	One year	Yes	The primary objective is to reassure investors that the Investment Fund actually invest their assets in an investment fund which incorporates ESG considerations throughout its investment process
Luxflag Microfinance label	2006	31	LuxFLAG, Luxembourg	One year	Yes	The primary objective is to reassure investors that the MIV actually invests, directly or indirectly, in the Microfinance sector
Novethic SRI Label	2009	170	Novethic, France	One year	Yes	The label is intended to be used by individual investors as a quality standard. It guarantees systematic integration of ESG criteria into fund management
Novethic Green Fund Label	2013	41	Novethic, France	One year	Yes	The label was introduced to provide investors with a benchmark by guaranteeing the environmental characteristics described by the fund management company

Appendix B

Survey Questions for Variables in the Econometric Analysis (Translated into English)

Variable: ‘Too Little Knowledge’

Please indicate how strongly you agree to the following statements regarding sustainable investments.

“I know too little about sustainable investments.”

I totally disagree	I rather weakly agree	I neither strongly nor weakly agree	I rather strongly agree	I totally agree	No statement
○	○	○	○	○	○

Variable: ‘Number of Information Sources’

Please indicate how you inform yourself before you invest in an investment product (*multiple responses possible*)

- Through conversations with a bank advisor
- Through conversations with an investment advisor who does not work for a bank
- Through conversations at a consumer advice center
- Through conversations with relatives/acquaintances/friends
- Through a magazine published by the Stiftung Warentest
- Through relevant finance magazines
- Through relevant websites
- Through newspapers
- Other information sources: _____
- No statement

Variables: ‘Poorly Informed’

For SRs, SKs, and INTs: Please indicate how strongly you agree with the following reasons for which you do not invest more strongly in sustainable investments now or within the next three years.

For CONVs: Please indicate how strongly you agree with the following reasons for which you do not invest in sustainable investments.

“I feel poorly informed about sustainable investments.”

I totally disagree	I rather weakly agree	I neither strongly nor weakly agree	I rather strongly agree	I totally agree	No statement
○	○	○	○	○	○

Variables: ‘No Offer by Bank’

For SRs, SKs, and INTs: Please indicate how strongly you agree with the following reasons for which you do not invest more strongly in sustainable investments now or within the next three years.

For CONVs: Please indicate how strongly you agree with the following reasons for which you do not invest in sustainable investments.

“My bank has not offered sustainable investments to me yet.”

I totally disagree	I rather weakly agree	I neither strongly nor weakly agree	I rather strongly agree	I totally agree	No statement
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Variables: ‘Distrust’

For SRs, SKs, and INTs: Please indicate how strongly you agree with the following reasons for which you do not invest more strongly in sustainable investments now or within the next three years.

For CONVs: Please indicate how strongly you agree with the following reasons for which you do not invest in sustainable investments.

“I do not trust that providers of sustainable investments follow the sustainability guidelines that they represent in their investment information.”

I totally disagree	I rather weakly agree	I neither strongly nor weakly agree	I rather strongly agree	I totally agree	No statement
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Variable: ‘Lower Return’

Please indicate your assessment of the average level of interest rates or returns of sustainable investments compared to conventional investments.

- The average interest rate or return is much lower for sustainable investments.
- The average interest rate or return is rather lower for sustainable investments.
- The average interest rate or return is neither higher nor lower for sustainable investments.
- The average interest rate or return is rather higher for sustainable investments.
- The average interest rate or return is much higher for sustainable investments.
- No statement

Variable: 'Higher Risk'

Please indicate your assessment of the average risk level of sustainable investments compared to conventional investments.

- The average risk is much lower for sustainable investments.
- The average risk is rather lower for sustainable investments.
- The average risk is neither higher nor lower for sustainable investments.
- The average risk is rather higher for sustainable investments.
- The average risk is much higher for sustainable investments.
- No statement

Variable: 'Higher Fees'

Please indicate your assessment of the average level of fees of sustainable investments compared to conventional investments.

- The average fees are much lower for sustainable investments.
- The average fees are rather lower for sustainable investments.
- The average fees are neither higher nor lower for sustainable investments.
- The average fees are rather higher for sustainable investments.
- The average fees are much higher for sustainable investments.
- No statement

Variable: 'Female'

Are you ...?

- Male
- Female

Variable: "Age"

Please indicate your age in years. _____ years

Variable: 'University Degree'

Please indicate your highest educational level.

- No educational level
- German "Hauptschulabschluss"
- Secondary school certificate (German "Mittlere Reife")
- Advanced technical college certificate, high school graduation (German "Abitur")
- Bachelor degree/degree from a University of Applied Sciences
- Master degree/diploma from a University
- Doctorate/habilitation
- Other educational level (enter): _____
- No statement

Variable: 'Income'

Please indicate the monthly net income of your household (income after taxes and social security contributions).

- below € 500
- € 500 to below € 1000
- € 1000 to below € 1500
- € 1500 to below € 2000
- € 2000 to below € 3000
- € 3000 to below € 4500
- € 4500 to below 6000
- € 6000 to below 7500
- € 7500 to below € 10,000
- € 10,000 or more
- No statement

Variable: 'Wealth'

Please indicate the amount of the monetary assets of your household.

- below € 500
- € 500 to below € 2000
- € 2000 to below € 5000
- € 5000 to below € 10,000
- € 10,000 to below € 20,000
- € 20,000 to below € 50,000
- € 50,000 to below € 100,000
- € 100,000 to below € 250,000
- € 250,000 or more
- No statement

Appendix C

Description of the SC Experiment On Equity Funds (Translated into English)

After you have chosen among different three-year fixed-interest investment products, on each of the following eight pages you will be shown four different equity funds, which differ in terms of certain characteristics. Please indicate for each of the eight decision situations, which of the four equity funds is as attractive to you that you would acquire it most likely. It is possible that some of the equity funds with their listed properties are currently not provided on the capital market. This should again not bother you. Just imagine that these equity funds are available in reality. Please additionally assume for your choice that the equity funds are identical with respect to all characteristics that are not shown (e.g. fund size, fund age, etc.). Some of the properties of the equity funds are explained in the following:

Net return in the last year: The individual equity funds differ in terms of the net return (return minus all costs and fees except subscription fees) of the last year.

Average annual net return in the last five years: The individual equity funds differ in terms of the net return (return minus all cost and fees except subscription fees) in the last five years.

Value of subscription fees: The individual equity funds differ in terms of the level of the one-time subscription fee, measured in % of the amount of money invested.

Sustainability criteria: The individual equity funds differ in terms of whether ecological, social, and/or ethical criteria are considered besides financial criteria in their construction process. Such sustainable equity funds additionally differ in terms of whether they receive a sustainability certificate. In this case, the consideration of sustainability criteria is audited and confirmed by an independent organization.

Transparency logo: The individual equity funds differ in terms of whether they receive a transparency logo. Such equity funds are characterized by the fact that extensive information on each investment strategy (also including the sustainability criteria if appropriate) is published. Equity funds with a transparency logo differ further in terms of whether the logo is issued by a state agency or by a non-governmental organization (NGO).

References

- Achtnicht, Martin, Georg Bühler, and Claudia Hermeling. 2012. The impact of fuel availability on demand for alternative-fuel vehicles. *Transportation Research Part D: Transport and Environment* 17(3):262–269.
- Allen, Franklin, and Anthony M. Santomero. 2001. What do financial intermediaries do? *Journal of Banking & Finance* 25:271–294.
- Amacher, Gregory S., Erkki Koskela, and Markku Ollikainen. 2004. Environmental quality competition and eco-labeling. *Journal of Environmental Economics and Management* 47(2):284–306.
- Bassen, Alexander, Katrin Gödker, Florian Lüdeke-Freund, and Josua Oll. 2019. Climate information in retail investors' decision-making: Evidence from a choice experiment. *Organization & Environment* 32(1):62–82.
- Bauer, Rob, and Paul Smeets. 2015. Social identification and investment decisions. *Journal of Economic Behavior & Organization* 117:121–134.
- Benson, Karen L., and Jacquelyn E. Humphrey. 2008. Socially responsible investment funds: Investor reactions to current and past returns. *Journal of Banking & Finance* 32(9):1850–1859.
- Bergmann, A., N. Hanley, and R. Wright. 2006. Valuing the attributes of renewable energy investments. *Energy Policy* 34:1004–1014.
- Bertsch, Valentin, Marie Hyland, and Michael Mahony. 2017. What drives people's opinions of electricity infrastructure? *Energy Policy* 106:472–497.
- Bollen, Nicolas P.B. 2007. Mutual fund attributes and investor behavior. *Journal of Financial and Quantitative Analysis* 42(3):683–708.
- Bonaparte, Yosef, and Alok Kumar. 2013. Political activism, information costs, and stock market participation. *Journal of Financial Economics* 107(3):760–786.
- De Bondt, Werner F.M. 1998. A portrait of the individual investor. *European Economic Review* 42(3–5): 831–844.
- Bonroy, Olivier, and Christos Constantatos. 2014. On the economics of labels: How their introduction affects the functioning of markets and the welfare of all participants. *American Journal of Agricultural Economics* 97(1):239–259.

- Borgers, Arian C.T., and Rachel A.J. Pownall. 2014. Attitudes towards socially and environmentally responsible investment. *Journal of Behavioral and Experimental Finance* 1:27–44.
- Boyle, Glenn, Roger Stover, Amrit Tiwana, and Oleksandr Zhylyevskyy. 2015. The impact of deposit insurance on depositor behavior during a crisis: A conjoint analysis approach. *Journal of Financial Intermediation* 24(4):590–601.
- Brécard, Dorotheé, Boubaker Hlaimi, Lucas Sterenn, Yves Perraudau, and Frédéric Salladarré. 2009. Determinants of demand for green products: An application to eco-label demand for fish in Europe. *Ecological Economics* 69(1):115–125.
- Calvet, Laurent E., John Y. Campbell, and Paolo Sodini. 2009. Measuring the financial sophistication of households. *American Economic Review* 99(2):393–398.
- Campbell, John Y. 2006. Household finance. *The Journal of Finance* 61(4):1553–1604.
- Cason, Timothy N., and Lata Gangadharan. 2002. Environmental labeling and incomplete consumer information in laboratory markets. *Journal of Environmental Economics and Management* 43(1):113–134.
- Cheah, Eng-Tuck, Johnnie E.V. Johnson Dima Jamali, and Ming-Chien Sung. 2011. Drivers of corporate social responsibility attitudes: The demography of socially responsible investors. *British Journal of Management* 22(2):305–323.
- Chrzan, Keith, and Bryan Orme. 2000. An overview and comparison of design strategies for choice-based conjoint analysis. In *Proceedings of the Sawtooth Software Conference*, ed. Sawtooth Software, 161–177. Sequim: Sawtooth Software Conference Proceedings.
- Derwall, Jeroen, Kees Koedijk, and Horst Jenke Ter. 2011. A tale of values-driven and profit-seeking social investors. *Journal of Banking & Finance* 35(8):2137–2147.
- Dorfleitner, Gregor, and Mai Nguyen. 2016. Which proportion of SR investments is enough? A survey-based approach. *Business Research* 9(1):1–25.
- Dorfleitner, Gregor, and Mai Nguyen. 2017. A new approach for optimizing responsible investments depending on the initial wealth. *Journal of Asset Management* 18(2):81–98.
- Dorfleitner, Gregor, and Sebastian Utz. 2014. Profiling German-speaking socially responsible investors. *Qualitative Research in Financial Markets* 6(2):118–156.
- Døskeland, Trond, and Lars J.T. Pedersen. 2016. Investing with brain or heart? A field experiment on responsible investment. *Management Science* 62(6):1632–1644.
- Entine, Jon. 2003. The myth of social investing: a critique of its practice and consequences for corporate social performance research. *Organization & Environment* 16:352–368.
- European Commission. 2018. *Sustainable finance: High-level expert group delivers roadmap for greener and cleaner economy*. Brussels: European Commission.
- Eurosif. 2016. *European SRI study 2016*. Brussels: Eurosif.
- Falk, Armin, Anke Becker, Thomas J. Dohmen, David Huffman, and Uwe Sunde. 2016. *The preference survey module: a validated instrument for measuring risk, time, and social preferences*. DP 01/2016-003.
- Favilukis, Jack. 2013. Inequality, stock market participation, and the equity premium. *Journal of Financial Economics* 107(3):740–759.
- Fifer, Simon, John Rose, and Stephen Greaves. 2014. Hypothetical bias in stated choice experiments: Is it a problem? And if so, how do we deal with it? *Transportation Research Part A: Policy and Practice* 61:164–177.
- FNG. 2018. *Marktbericht Nachhaltige Geldanlagen 2018: Deutschland, Österreich und die Schweiz*. Berlin: Forum Nachhaltige Geldanlagen e. V.,
- Friede, Gunnar, Timo Busch, and Alexander Bassen. 2015. ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment* 5(4):210–233.
- Gamel, Johannes, Klaus Menrad, and Thomas Decker. 2017. Which factors influence retail investors' attitudes towards investment in renewable energies? *Sustainable Production and Consumption* 12:90–103.
- García, María J.R. 2013. Financial education and behavioral finance: New insights into the role of information in financial decisions. *Journal of Economic Surveys* 27(2):297–315.
- Georgarakos, Dimitris, and Giacomo Pasini. 2011. Trust, sociability, and stock market participation. *Review of Finance* 15(4):693–725.
- Goett, Andrew A., Kathleen Hudson, and Kenneth E. Train. 2000. Customers' choice among retail energy suppliers: the willingness-to-pay for service attributes. *The Energy Journal* 21(4):1–28.
- Greene, William H. 2012. *Econometric analysis*, 7th edn., Edinburgh Gate: Pearson Education.
- Guiso, Luigi, Paolo Sapienza, and Luigi Zingales. 2008. Trusting the stock market. *The Journal of Finance* 63(6):2557–2600.

- Gutsche, Gunnar, and Andreas Ziegler. 2019. Which private investors are willing to pay for sustainable investments? Empirical evidence from stated choice experiments. *Journal of Banking & Finance* 102:193–214.
- Gutsche, Gunnar, Anja Köbrich León, and Andreas Ziegler. 2019. On the relevance of contextual factors for socially responsible investments. *Oxford Economic Papers* 71(3):756–776.
- Haliassos, Michael, and Carol C. Bertaut. 1995. Why do so few hold stocks? *The Economic Journal* 105(432):1110–1129.
- Hartzmark, Samuel M., and Abigail B. Sussman. 2019. Do investors value sustainability? A natural experiment examining ranking and fund flows. *The Journal of Finance* 74(6):2789–2837.
- Heinkel, Robert, Alan Kraus, and Josef Zechner. 2001. The effect of green investment on corporate behavior. *The Journal of Financial and Quantitative Analysis* 36(4):431–449.
- Hensher, David A., and William H. Greene. 2003. The mixed logit model: The state of practice. *Transportation* 30(2):133–176.
- Hensher, David A., M. Rose John, and William H. Greene. 2010. *Applied choice analysis: A primer*. Cambridge: Cambridge University Press.
- Hensher, David A., Nina Shore, and Kenneth Train. 2005. Households' willingness to pay for water service attributes. *Environmental & Resource Economics* 32(4):509–531.
- Hirshleifer, David. 2015. Behavioral finance. *Annual Review of Financial Economics* 7(1):133–159.
- Hole, Arne R. 2007. Fitting mixed logit models by using maximum simulated likelihood. *The Stata Journal* 7(3):388–401.
- Hoyos, David. 2010. The state of the art of environmental valuation with discrete choice experiments. *Ecological Economics* 69(8):1595–1603.
- Ibanez, Lisette, and Gilles Grolleau. 2008. Can ecolabeling schemes preserve the environment? *Environmental and Resource Economics* 40(2):233–249.
- Kalkbrenner, Bernhard J., Koichi Yonezawa, and Jutta Roosen. 2017. Consumer preferences for electricity tariffs: does proximity matter? *Energy Policy* 107:413–424.
- Lee, Boram, and Yulia Veld-Merkoulova. 2016. Myopic loss aversion and stock investments: an empirical study of private investors. *Journal of Banking and Finance* 70:235–246.
- Lewis, Alan, and Craig Mackenzie. 2000. Morals, money, ethical investing and economic psychology. *Human Relations* 53(2):179–191.
- Mason, Colin, and Matthew Stark. 2004. What do investors look for in a business plan? A comparison of the investment criteria of bankers, venture capitalists and business angels. *International Small Business Journal* 22(3):227–248.
- Mathews, John A., Sean Kidney, Karl Mallon, and Mark Hughes. 2010. Mobilizing private finance to drive an energy industrial revolution. *Energy Policy* 38(7):3263–3265.
- McFadden, Daniel. 1973. Conditional logit analysis of qualitative choice models. In: Zarembka, P. (Ed.), *Frontiers in Econometrics*. Academic Press, New York, pp. 105–142
- Nakai, Miwa, Tomonori Honda, Nariaki Nishino, and Kenji Takeuchi. 2018. Psychological characteristics of potential SRI investors and its motivation in Japan: An experimental approach. *Journal of Sustainable Finance & Investment* 8(4):349–367.
- Nilsson, Jonas. 2008. Investment with a conscience: examining the impact of pro-social attitudes and perceived financial performance on socially responsible investment behavior. *Journal of Business Ethics* 83(2):307–325.
- Paetzold, Falko, and Timo Busch. 2014. Unleashing the powerful few: sustainable investing behaviour of wealthy private investors. *Organization & Environment* 27(4):347–367.
- Pérez-Gladish, Blanca, Karen Benson, and Robert Faff. 2012. Profiling socially responsible investors: Australian evidence. *Australian Journal of Management* 37(2):189–109.
- Rathner, Sebastian. 2013. The influence of primary study characteristics on the performance differential between socially responsible and conventional investment funds: a meta-analysis. *Journal of Business Ethics* 118(2):349–363.
- Rhodes, Mark J. 2010. Information asymmetry and socially responsible investment. *Journal of Business Ethics* 95(1):145–150.
- Riedl, Arno, and Paul Smeets. 2017. Why do investors hold socially responsible mutual funds? *The Journal of Finance* 72(6):2505–2550.
- van Rooij, Maarten, Annamaria Lusardi, and Rob Alessie. 2011. Financial literacy and stock market participation. *Journal of Financial Economics* 101(2):449–472.
- Rosen, Barry N., Dennis M. Sandler, and David Shani. 1991. Social issues and socially responsible investment behavior: a preliminary empirical investigation. *Journal of Consumer Affairs* 25(2):221–234.

- Schrader, Ulf. 2006. Ignorant advice—customer advisory service for ethical mutual funds. *Business Strategy and the Environment* 15(3):200–214.
- Swait, Joffre D., and J.J. Louviere. 1993. The role of the scale parameter in the estimation and comparison of multinomial logit models. *Journal of Marketing Research* 30(3):305–314.
- Teisl, Mario F., Brian Roe, and Robert L. Hicks. 2002. Can eco-labels tune a market? Evidence from dolphin-safe labeling. *Journal of Environmental Economics and Management* 43:339–359.
- Tippet, John, and Philomena Leung. 2001. Defining ethical investment and its demography in Australia. *Australian Accounting Review* 11(25):44–55.
- Train, Kenneth. 2009. *Discrete choice methods with simulation*, 2nd edn., Cambridge: Cambridge University Press.
- UNFCCC. 2015. Paris Agreement. http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf. Accessed 26 Jan 2018.
- Vissing-Jorgensen, Annette. 2004. Perspectives on behavioral finance: Does “irrationality” disappear with wealth? Evidence from expectations and actions. *National Bureau of Economic Research Macroeconomics Annual 2003* 18:139–208.
- von Wallis, Miriam, and Christian Klein. 2015. Ethical requirements and financial interest: a review of the socially responsible investment literature. *Business Research* 8:61–98.
- Wilcox, Ronald T. 2003. Bargain hunting or star gazing? Investors’ preferences for stock mutual funds. *Journal of Business* 76(4):645–663.
- Wins, Anett, and Bernhard Zwergel. 2016. Comparing those who do, might and will not invest in sustainable funds: a survey among German retail investors. *Business Research* 9(1):51–99.
- Ziegler, Andreas. 2012. Individual characteristics and stated preferences for alternative energy sources and propulsion technologies in vehicles: A discrete choice analysis for Germany. *Transportation Research Part A* 46:1372–1385.

Publisher’s Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.