Sustainable and responsible investments
&
private investors in Germany

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List of abbreviations

BMUB	Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit
CL	Conditional logit
CO2	Carbon dioxide
DCE	Discrete choice experiment
e.g.	Exempli gratia (for example)
ESG	Environmental, social, and governance
EU	European Union
Eurosif	European Sustainable and Responsible Investment Forum
FNG	Forum Nachhaltige Geldanlagen e.v.
GHG	Greenhouse gas
HNWIs	High net worth individuals
i.e.	id est (that is)
IIA	Independence of irrelevant alternatives
INDCs	Intended nationally determined contributions
LCLM	Latent class logit models
ML	Maximum likelihood
MLM	Mixed logit models
MNL	Multinomial logit models
NGO	Non-governmental organization
SC	Stated choice
SML	Simulated maximum likelihood
SP	Stated preferences
SRI	Socially responsible investment (or sustainable and responsible investment)
UK	United Kingdom
US	United States of America
USA	United States of America
WTP	Willingness to pay

"The Times They Are A Changin"- Bob Dylan

"Money has to serve, not to rule!" - Pope Francis

1. Introduction

1.1 Background

Sustainable and responsible investments (SRI) have grown strongly over the past two decades, but corresponding investment volumes are still rather small compared to those of conventional investments (e.g., Mollet and Ziegler, 2014). However, as available figures show, SRI have already become relevant in many areas of the economy and can become highly important in the following years. This broad group of investments is also often called socially responsible investments, sustainable investments, ethical investments, responsible investments, etc. The specific name depends on several issues, such as the regional context or thematic priorities of the corresponding investments (for more details, see the discussion by Sandberg et al., 2009). Throughout this thesis, these expressions are used synonymously. In this thesis SRI is understood in the sense of the current and broad definition by the European Sustainable and Responsible Investment Forum (Eurosif). Accordingly, the term SRI is defined as "long-term oriented investment approach which integrates ESG [i.e. environmental, social, and governance] factors in the research, analysis and selection process of securities within an investment portfolio. It combines fundamental analysis and engagement with an evaluation of ESG factors in order to better capture long term returns for investors, and to benefit society by influencing the behaviour of companies." (Eurosif, 2016).

The following figures illustrate the increasing popularity of SRI. Over the time period from 1995 to 2014, assets under management of investment strategies incorporating ESG criteria in the US grew by 929% to a current value of 6.20 trillion US dollar. Between 2012 and 2014 alone, this market grew by 76% (US SIF, 2014). Due to different SRI categorization schemes, US figures should not be compared directly to numbers published by Eurosif for the European market. However, according to the aforementioned definition of Eurosif, the European market grew by 22.6% between 2011 and 2013 (Eurosif, 2014). For Germany, as the largest national economy in Europe, the national roof organization for SRI "Forum Nachhaltige Geldanlagen (FNG)" reports

that the market grew from 79.9 billion euro in 2013 to 136.6 billion euro in 2015, i.e. by 71% within two years (FNG, 2014, 2016).

FNG (2016) further suggests that almost every conventional investment product has a counterpart applying a sustainable and responsible investment strategy. Thus, investors are confronted with a large variety of investment products, since SRI providers, e.g., fund companies, can additionally apply diverse investment strategies for constructing their products. For example, FNG (2015b) lists eight different sustainable investment strategies: Exclusion of holdings from investment universe, best-in-class investment selection, engagement and voting on sustainability matters, impact investment, integration of ESG factors in financial analysis, sustainability themed investment, norm-based screening, and using the right to vote (see FNG, 2015b for detailed information). From a practical perspective, investors following SRI strategies can, for example, apply positive screening strategies and hence invest in firms with a high sustainability performance, or in specific projects or themes, such as green energy production and related infrastructure (e.g., solar energy or wind power), innovative and environmentally friendly products or process innovations, or vehicles with green propulsion techniques. Another prominent investment approach considers the exclusion of certain firms from the investment universe (also named negative screening). These investment strategies avoid investments in so-called sin stocks, i.e. shares of firms from the sextet of sin industries, namely adult entertainment, alcohol, gambling, nuclear power, tobacco, and weapons (Lobe and Walkshäusl, 2016). In this context, practitioners and researchers also discuss the implications of the divesting movement, which refers to selling shares of environmentally or socially controversial firms, such as companies from energy-intensive industries.

This illustrates that SRI can also be an important instrument in order to achieve and implement the ambitious (long-term) goals resolved in current climate negations like the 21st Conference of the Parties in Paris. These goals, such as keeping the temperature well below 2 °C and reduce greenhouse gas (GHG) emissions (UNFCCC, 2015), and also the related intended nationally determined contributions (INDCs)[1], require severe efforts and changes in many economic sectors, areas of life, and hence also in behaviors of market participants. Policy makers seem to agree that

[1] With respect to INDCs, Germany set the goal to reduce CO2 emissions by 40% until 2020 compared to 1990, and by 80% to 95% until 2050 (BMUB (2014)). Lately, the European Union and its Member states set the binding target to reduce domestic GHG emissions by at least 40% until 2030 compared to 1990 (European Commission (2016)).

these actions and developments have to be framed and accompanied by corresponding financial flows as also mentioned in paragraph 1 c) of Article 2 of the Paris Agreement (UNFCCC, 2015).

In this context, several studies already argue that it is important to understand determinants of individual behavior in order to find efficient, well-targeted, and socially accepted solutions and policy measures to accelerate the transformation process (e.g., Clark et al., 2003; Andorfer, 2013; Schwirplies and Ziegler, 2016). However, related empirical studies mainly concentrate on sustainable individual behaviors in context of consumption and transport decisions (e.g., Kahn, 2007; Costa and Kahn, 2013), and only a few studies consider individual investment decisions in context of SRI (e.g., Nilsson, 2008; Bauer and Smeets, 2015; Riedl and Smeets, 2016; Wins and Zwergel, 2016).

This thesis adds on this limited research by focusing on individual investment behavior and SRI. On the one hand, it aims to empirically identify financial and especially non-financial motives (e.g., social norms, personal values and identity, with a special focus on religion and political orientation) that might drive individual decision makers. Hereby, it also considers the relationship between investments and other fields of individual behavior, such as consumption and mobility decisions, and connects several strands of literature. On the other hand, it examines potential barriers that might prevent private investors from investing in SRI. In this respect, it searches for potential solutions to overcome or reduce these barriers, and asks whether labelling schemes could help to decrease barriers for (potential) SRI investors by increasing transparency and levels of information. Thereby, it directly refers to current market developments. Understanding determinants of individual investments in SRI in particular, and gaining information on individual characteristics which (jointly) drive sustainable behavior in general, helps policy makers to find targeted and adequate measures for addressing private investors. Besides, this also has direct implications for market players, such as banks or fund providers.

1.2 State of research and objectives of this thesis

So far, the main direction of research in the field of SRI has been the empirical comparison of the sustainable and conventional investment products' financial performance, such as mutual funds (e.g., Bauer et al., 2005; Renneboog et al., 2008b) or stocks of firms with a high or low

sustainability performance (e.g., Edmans, 2011; Borgers et al., 2015). Closely related, other studies ask whether socially controversial investments (sin stocks), i.e. investments in tobacco, alcohol, weapon, or gambling firms (or industries), yield higher returns than sustainable investments (e.g., Hong and Kacperczyk, 2009; Salaber, 2013). Theoretical considerations, as for example discussed by Bollen (2007) or Derwall et al. (2011), provide explanations for both the underperformance, but also the outperformance of SRI compared to conventional investment products. For example, constructing SRI by negative screening strategies that, for example, exclude sin stocks from the underlying investment universe, means limiting the investment opportunities. In turn, according to Markowitz' (1952) modern portfolio theory, these strategies consequently rule out the optimal risk-return allocation. On the other hand, according to the "shunned-stock hypothesis" introduced by Derwall et al. (2011), sin stocks are avoided by a certain type of investors, namely values-driven investors, and thus may have higher returns than conventional investments if their number is sufficiently large. On the contrary, it is also argued that a good sustainability performance of a firm indicates good management practices, which is associated with higher risk-adjusted returns (Bollen, 2007). As a final example, the "errors-in-expectations" hypothesis by Derwall et al. (2011) postulates that investors price SRI incorrectly in the short-run, which consequently leads to higher risk-adjusted returns. Literature reviews and meta analyses show that the majority of empirical performance studies find no performance differences between SRI (funds) and conventional investments and mostly a positive relationship between the sustainability performance of a firm and its financial success (e.g., Rathner, 2013; Friede et al., 2015; von Wallis and Klein, 2015). Differences in the results of the various studies are explained by different samples, econometric approaches, regions, or the survivorship bias (e.g., Rathner, 2013; Friede et al., 2015).

The concept of values-driven investors introduced by Derwall et al.'s (2011) implies that investors do not only focus on financial attributes when making investment decisions, but also consider non-financial issues that are in conformity with their personal values. With respect to investment decisions in general, i.e. conventional investment products, several studies show that non-financial factors, such as trust (e.g., Guiso et al., 2008; Georgarakos and Pasini, 2011), sociability (e.g., Hong et al., 2004; Brown et al., 2008; Georgarakos and Pasini, 2011), but also personal values expressed by religion (e.g., Renneboog and Spaenjers, 2012) or political orientation (e.g., Kaustia and Torstila, 2011) influence individuals. In context of SRI, Derwall et

al. (2011) even argue that values-driven investors are willing to sacrifice return in order to invest in SRI and thus derive non-financial utility from investments they make. In this light, several empirical studies, for example, examine whether and which investors behave solely on the basis of financial performance issues, i.e. invest in SRI as they expect a superior financial performance, or whether investors of SRI behave differently compared to conventional investors, by involving and valuing other factors beyond the typical risk-return paradigm. If so, this would consequently contradict modern portfolio theory postulating that persons choose the portfolio with the most favorite risk-return combination (e.g., Markowitz, 1952; Riedl and Smeets, 2014; Døskeland and Pedersen, 2016). To this end, some studies empirically analyze fund flows into and out of sustainable and conventional funds. In this way, these studies investigate whether SRI or conventional funds are more sensitive to past negative or positive returns so that general conclusions on investors' reactions and behavior can be made (e.g., Bollen, 2007; Renneboog et al., 2011). Findings suggest that returns of SRI funds are less sensitive to negative returns, but more sensitive to positive returns, which is interpreted in the way that the non-financial attributes, i.e. the degree of sustainability, influence investment decisions, and thus the investors' utility function. However, it is not feasible to identify specific (individual) motives with this approach.

These results are supported by another strand of empirical studies whose findings also suggest that values expressed by political (e.g., Hong and Kostovetsky, 2012; Hood et al., 2014; Borgers et al., 2015) or religious affiliation (e.g., Salaber, 2013; Hood et al., 2014; Borgers et al., 2015) influence investment decisions in context of SRI or socially controversial investments. However, these findings are also rather indirect as they either use aggregate data such as mutual fund holdings (Hong and Kostovetsky, 2012; Salaber, 2013) or regional political proxies for social norms and values like Hood et al. (2014) and Borgers et al. (2015). Further, these studies mainly consider the US market, and only a few address other markets, such as Europe (e.g., Salaber, 2013). Thus, while suggesting that non-financial issues play a role in investment decisions, these studies still do not allow to draw conclusions on individual preferences and motives.

Hence, other kinds of data or approaches are needed in order to identify preferences for SRI at the individual level. However, revealed data or information on real individual investment decisions are rare (exceptions are Døskeland and Pedersen, 2016 and Riedl and Smeets, 2016) and not without limitations. By way of example, there is no guarantee that the observed

investment outcomes, such as individuals' holdings at a certain bank, are made by the individuals on their own or after consulting a bank advisor (e.g., Clark-Murphy and Soutar, 2004). Besides, another shortcoming of revealed data is that the researcher cannot empirically analyze non-chosen alternatives as individuals cannot take those attributes or investment alternatives into account that they do not know (e.g., Hensher et al., 2010). Hence, certain research questions (e.g., about product attributes, e.g. labels, which are not implemented in current products yet) cannot be answered by analyzing these kinds of data. A way to overcome these limitations and problems is the conduction of surveys or experimental settings (and combinations of both). This was done in several studies recently.

Studies using these methods can be distinguished according to their target group, sampling method, and the region they were conducted in (and also other aspects, e.g., sample size, time period, etc.). A common approach is to interview customers of fund providers or sustainability banks (Rosen et al., 1991; Nilsson, 2008; Nilsson, 2009; Bauer and Smeets, 2015; Riedl and Smeets, 2016) or to use data from broad, but unrepresentative surveys among private investors, not being customers of a specific bank (Dorfleitner and Utz, 2014; Wins and Zwergel, 2016). Contrary to the strong US focus of the aforementioned studies focusing on aggregated data, these surveys capture information on investors from several countries or regions, such as the Netherlands (e.g., Bauer and Smeets, 2015; Riedl and Smeets, 2016), Sweden (e.g., Nilsson, 2008; Nilsson, 2009), the UK (e.g., Lewis and Mackenzie, 2000; Berry and Junkus, 2013), German speaking countries (e.g., Dorfleitner and Utz, 2014; Paetzold and Busch, 2014; Wins and Zwergel, 2016), and also the US (e.g., Rosen et al., 1991). Findings show that perceived financial performance (e.g., Bauer and Smeets, 2015; Nilsson, 2008; Paetzold and Busch, 2014; Riedl and Smeets, 2016), trust (e.g., Nilsson, 2008; Wins and Zwergel, 2016), intrinsic social preferences (Riedl and Smeets, 2016), social identification (Bauer and Smeets, 2015), or pro-social attitudes (e.g., Nilsson, 2008) positively influence individual SRI investment behavior.

In order to reveal whether investors gain non-financial utility from SRI, some studies investigate whether investors are willing to sacrifice a certain amount of return in order to invest in sustainable investment products. This is done either indirectly by observing investors which are invested in SRI although they perceive the financial performance of SRI as inferior compared to their conventional counterparts (e.g., Riedl and Smeets, 2016), or (rather) directly by asking them

about the amount they are willing to sacrifice (e.g., Dorfleitner and Utz, 2014; Borgers and Pownall, 2014) and by analyzing individual valuations with respect to hypothetical investment scenarios (e.g., Lewis and Mackenzie, 2000; Webley et al., 2001; Pasewark and Riley, 2010; Wins and Zwergel, 2016). Other studies combine surveys with experimental approaches (e.g., Riedl and Smeets, 2016) or conduct experiments in computer labs (e.g. Webley et al., 2001; Hofmann et al., 2008; Barreda-Tarrazona et al., 2011) or even in the field (Døskeland and Pedersen, 2016) in order to get closer to real-world conditions. Generally, these studies show that certain groups derive utility from the sustainable component of an investment. This implies that models considering purely financial determinants for explaining individual investment behavior omit important issues (e.g., Hofmann et al., 2008) and that investors obviously value information on the sustainable component of an investment (e.g., Barreda-Tarrazona et al., 2011).

However, besides typical problems of surveys, such as socially desirable answers or overstatement by interviewees, the strategy of directly asking respondents for their preferences or important attributes in (past) investment decisions "is subject to conscious or unconscious errors associated with post hoc rationalization and recall bias" (Mason and Stark, 2004, p. 234). All mentioned studies (including the experimental studies) have in common that they do not analyze representative data, often exclude pure conventional investors (see Wins and Zwergel, 2015 for a worldwide review of sustainable investors), or even focus on students (e.g. Hofmann et al., 2008; Pasewark and Riley, 2010; Barreda-Tarrazona et al., 2011). Most experiments, in particular, were done with students (e.g., Pasewark and Riley, 2010; Barreda-Tarrazona et al., 2011), and only a few were able to conduct experiments among customers of (sustainability) banks (e.g., Døskeland and Pedersen, 2016) or fund providers (Riedl and Smeets, 2016). Hence, it is an empirical question whether the aforementioned results are externally valid and hold in a more general setting.

Further, several aspects are not considered which are important in other areas of sustainable behavior such as consumption decisions. This is remarkable, as some studies already suggest that SRI is just an extension of sustainable behavior, i.e. an expression of a sustainable lifestyle (e.g., Rosen et al., 1991; Wins and Zwergel, 2015), or "an extreme form of tastes for assets as consumption goods that are unrelated to returns" (see Fama and French, 2007, p. 675). However, there is yet a missing link to the literature and determinants of pro-social or sustainable behavior.

Few exceptions are Nilsson (2008), Døskeland and Pedersen (2016), and Bauer and Smeets (2015) integrating marketing research, theory of moral behaviors, and social identification, respectively, as explanatory factors. Still, typical aspects and determinants of pro-social behavior are not addressed, although it is well-known from many disciplines, such as psychology, sociology, or economics that sustainable behavior is affected by various and often related factors (e.g., Bénabou and Tirole, 2010). Previous studies show that individual psychological factors and personal attitudes, psychological benefits and losses, such as reputational gains, status reasons, altruism, or warm glow (e.g., Kahn, 2007; Kotchen and Moore, 2008; Dastrup et al., 2012; Schwirplies and Ziegler, 2016), environmental awareness or concerns (e.g., Kotchen and Moore, 2008), and socio-economic or -demographic factors, such as income or gender (e.g., Andorfer, 2013) affect individual consumption decisions or sustainable behaviors. Particularly, as mentioned above, religion and political orientation may play important roles, but are nearly completely neglected in these studies. Hence, both the literature on (sustainable) investment decisions and the literature on sustainable consumption would benefit if they were connected. Here it is also interesting to further investigate whether sustainable behaviors which differ in terms of scrutiny or irreversibility are driven by the same or similar motives and how external factors, such as peers, can affect them (see also Welsch and Kühling, 2009; Videras et al., 2012; Blasch and Farsi, 2014).

Studies in the context of SRI mainly focus on motives to invest in SRI, but do not directly address (potential) barriers that prevent private investors from investing in SRI. Only Paetzold and Busch (2014) directly consider barriers, but only for a sub-group of private investors, namely high net worth individuals. However, identifying market entry barriers as well as appropriate measures to reduce them should be an issue as it seems obvious that, particularly less sophisticated, private investors are overwhelmed by information or the complexity of SRI (Nilsson et al., 2012). This question is obviously closely linked to the literature on participation costs as introduced by Vissing-Jorgensen (2004). Issues like information asymmetries (Rhodes, 2010) and (dis-) trust should be taken into account in case of SRI, as suppliers of these products have an advance in knowledge compared to normal investors. Investors are not able to assess whether a certain investment is really sustainable (Nilsson et al., 2012). In the context of conventional investment products, previous studies find that private investors can be prone to a vast variety of factors that prevent them from stock market participation, such as low financial

literacy (e.g., van Rooij et al., 2011), (dis-) trust (e.g., Guiso et al., 2008), or also political values as discussed above (e.g., Kaustia and Torstila, 2011). In empirical studies on SRI, Nilsson (2008) and Wins and Zwergel (2016) find that distrust in SRI providers, the perception of financial performance of SRI compared to conventional products (e.g., Nilsson, 2008; Paetzold and Busch, 2014; Bauer and Smeets, 2015; Wins and Zwergel, 2015; Riedl and Smeets, 2016), information and knowledge related issues (e.g., Rhodes, 2010; Nilsson et al., 2012; Borgers and Pownall, 2014; Riedl and Smeets, 2016) as well as a bad performance of advisors (Schrader, 2006) might be crucial barriers that hinder private investors from investing in SRI. Hence, it appears to be important to analyze several barriers jointly in order to find solutions to overcome these market entry hurdles.

Finally, as information disclosure and reducing information costs are typical solutions for asymmetric information problems (e.g., Campbell et al., 2011), sustainability labels or certificates (as recently published by the FNG) may provide a potential solution. However, while there are several studies in the consumer literature examining whether consumers react toward labels (e.g., Teisl et al., 2002) or whether they are willing to pay a price premium for labelled products (e.g., Loureiro and Lotade, 2005), there is no study in the field of SRI. Besides, it is interesting to examine whether these labels would help particularly those investors, which are hindered, for certain reasons, to enter the SRI market.

This thesis addresses the gaps described in this section and aims to reach the following targets: (i) disentangle and identify individual motives and preferences for SRI , (ii) identify barriers preventing private investors from investing in SRI, (iii) provide potential solutions and measures for politics or market players, such as intermediaries and service providers, in order to overcome certain problems and stimulate demand for SRI, (iv) investigate the linkage between SRI and other individual sustainable behaviors, such as consumption decisions, and (v) use sophisticated econometric approaches for the analysis of a broad and representative dataset containing information on investment (and other) behaviors of private investors in order to derive valid and reliable results.

1.3 Methodological strategy, contributions, and main results

All four studies presented in this thesis are based on data from a (online) representative, computer-based survey among financial decision makers in German households. The survey was planned from April to December 2013 in collaboration between the Chair of Empirical Economic Research and the Chair of Corporate Finance, which are both based at the University of Kassel. The field phase took place during December 2013 and January 2014. The survey was conducted in cooperation with the German market research company GfK SE, which was responsible for programming the online questionnaire and two stated choice (SC) experiments, and particularly for recruiting respondents from a company-owned online panel, which comprises nearly 30000 persons. The survey was funded by the Chair of Empirical Economic Research at the University of Kassel with some co-financing from the Hessian Department of the Federal Reserve Bank of Germany in the amount of about one fifth of the survey costs.

The GfK SE guaranteed a (online) representative sample with at least 1000 financial decision makers in German households. The sample was representative with respect to the respondents' age, gender, and their place of origin. We define decision makers as persons who are at least 18 years of age, mainly or equally responsible for the household's financial decisions, and who hold at least a savings account. We introduced the latter requirement in order to ensure a minimum degree of financial knowledge among the respondents. Only persons who fulfilled these requirements, which are checked via filter questions, were allowed to participate in the survey. Further, the research company used a company-owned quality saving tool in order to ensure a high quality of answers. Thus, participants who showed a conspicuous response behavior, for example, in terms of systematic or fast answers, were excluded by the GfK SE before we received the dataset. The final sample, which is the basis for the analyses conducted in the four following studies, contains 1001 financial decisions makers in German households. 172 persons have been excluded by the GfK SE before due to bad response quality/behavior.

The survey contained two main methodological approaches, which both had the objective to uncover individual preferences for SRI as well as determinants of individual investment decisions in context of SRI and other (sustainable) behaviors. First, we implemented a large variety of questions in order to directly and indirectly identify individual preferences toward a variety of (sustainable) consumption behaviors and activities, investment behavior in general and

particularly in context of SRI, and to capture socio-demographic and socio-economic characteristics. Secondly, the questionnaire comprised two SC experiments, which refer to (hypothetical) investment decisions in context of two classes of investment products, namely fixed-interest investment products and equity funds. The original German version of the questionnaire is presented in Appendix B.

The first study of this thesis entitled "On the relevance of psychological motives, values, and norms for socially responsible investments: An econometric analysis" aims to identify determinants of investments in SRI at the individual level. To this end, it econometrically connects answers to questions about the respondents' share SRI of the total investment portfolio, perceived relative financial performance of SRI compared to conventional investment products, psychological motives, social norms, and socio-demographic characteristics. The econometric analysis reveals that the perceived financial performance of SRI matters for the SRI shares among all investments. However, psychological motives, values, and norms like warm glow motives and expectations of the social environment are even more relevant and have strong significant effects on SRI. This suggests that SRI investors gain strong non-financial utility from SRI. While the membership in Christian churches and the strength of Christian religiosity also seem to be positively correlated with SRI, these correlations become insignificant if other psychological motives, values, and norms are included in the econometric analysis. Furthermore, a left-wing political orientation rather has significant negative effects on SRI, which can be explained by a general aversion of a left-wing identification to the participation in financial markets. This study contributes to the research area of social norms and personal values and its connection to economic behavior, but particularly to the literature on determinants of SRI. Unlike previous studies, this study considers a broad set of explanatory variables, and further allows to draw conclusions to the broad community of financial decisions makers.

The second study entitled "Are private investors willing to pay for sustainable investments? A stated choice experiment" asks what types of investors are willing to sacrifice return in order to invest in SRI. Therefore, this study analyzes the respondents' choices in the two SC experiments, i.e. choices among several equity funds and among several three-year fixed-interest rate investment products. Moreover, it addresses some of the questions that were already considered in the first study and aims to identify whether the willingness to pay (WTP) varies across

different investors groups in terms of social norms, or other personal values. On the basis of both SC experiments, the econometric analysis with flexible mixed logit models reveals strong stated preferences and thus a considerable WTP for SRI. For example, the estimated average willingness to sacrifice yearly interest rates in sustainable fixed-interest investment products amounts to 0.21 percentage points. These results are very stable across several robustness checks that also include different techniques to mitigate possible hypothetical biases. A latent class logit model analysis additionally reveals that specific social values and norms play an important role. Investor groups with high feelings of warm glow from SRI, strong considerations of norms by the social environment with respect to SRI, strong environmental values, and an affinity to left-wing parties have a substantially higher estimated average WTP for sustainable fixed-interest investment products. Hence, while this study obviously contributes to similar research fields as the first study, it, however, introduces a new way to reveal individual (stated) preferences for different kinds of investment products. Thereby, it accounts for several potential drawbacks of pure questionnaire-based analysis and allows us to analyze non-chosen alternatives as well as to integrate different labels, which have not been analyzed in previous studies yet.

Study number three has the title: “Information barriers and individual participation in the sustainable and responsible investment market – Can sustainability and transparency labels help?” and analyzes barriers preventing private investors from participating in the market of SRI. Therefore, it connects answers of the respondents to specific questions about the individuals’ levels of information and perceived investment barriers with choice data from the SC experiment on equity funds. In the first place, the study analyzes and reveals barriers of different investor groups, namely sustainable, skeptical, interested, and conventional investors, which were identified on the basis of a specific filter question. Afterwards, the second part specifically examines whether labeling schemes for SRI funds represent a solution to overcome these barriers. The paper shows that the investor types face different barriers regarding SRI market participation. Particularly too high (perceived) information costs regarding SRI prevent investors from investing (more) in SRI. Receiving no offer by their bank is a big market entry hurdle especially for interested investors. It further finds that distrust in providers of SRI is a severe issue discouraging skeptical and conventional investors. The SC experiment reveals that investors of all groups have positive preferences for funds with transparency or sustainability labels and thus labels are an opportunity to decrease information costs thereby enhancing individual demand

for SRI. Hence, this study is the first study in the field of SRI, which thoroughly examines different barriers, such as too high information costs, little knowledge of SRI, or distrust in providers of SRI, which might prevent private investors from participation in the SRI markets. Thereby, it transfers the participation costs framework by Vissing-Jorgensen (2004), which has before been applied only in the context of individual investment decisions in general, to SRI market participation. Finally, this study is also of practical relevance, as it is the first study that tries to examine whether labels for SRI funds can help to decrease information asymmetries between SRI providers and private investors.

The fourth study entitled "Religion, political orientation, and sustainable behavior – An econometric analysis of individual consumption and investment decisions" finally examines the linkage between individuals' preferences toward ecological and social/ethical criteria in investment decisions with the importance of these issues in context of other activities or behaviors, such as consumption decisions or choice of transportation. Specifically, it focuses on the role of individual and regional religion, religiosity, and political orientation as measures of social norms and individual identity and these different fields of individual behaviors. Therefore, it matches the questionnaire data and with officially available information on regional religion and political preferences at the zip code level. The econometric analysis reveals a positive relationship between (religious) Catholics or Protestants as well as persons with a political left-wing or green party orientation and several sustainable behaviors, such as pro-environmental or pro-social purchases of food, clothes, cars, or investment decisions. Further, it finds qualitatively similar relationships when considering regional measures for religion and political orientation. This implies that these factors are positively related toward different behaviors independently of their degree of observability or importance in terms of irreversibility, thereby emphasizing the importance of social identity and categories for individual behavior in general. Consequently, this study extends existing literature about SRI, and particularly connects this field to other (sustainable) behaviors. Further, it is the first study in this field, which connects individual data from questionnaire data with official regional information. Besides, it additionally contributes to the research on religion and political orientation and economic behavior. As in the studies before, the results can be used for targeted information campaigns by politicians to enhance sustainable behaviors or acceptance for related policy measures.

1.4 Conclusion, discussion, and future research needs

This chapter summarizes the main results of this thesis and what they imply for future research, but also practitioners and policy makers. In this context, it also discusses some issues that might be criticized.

By applying different methodological approaches, this thesis empirically shows that social norms, psychological factors, and environmental values are important drivers motivating financial decisions makers to invest in SRI or being at least interested in this large universe of investment products. It also reveals that these factors can be used to identify investor groups with different average WTP. The fourth paper, which considers religious affiliation (and also religious strength) and political orientation as indicators for social norms or expression of personal values, particularly connects SRI with other sustainable behaviors and shows that a wide variety of pro-social or pro-environmental behaviors, irrespectively of their degree of observability and (ir-) reversibility, are related to each other and influenced by similar norms. Hereby, it shows that individual as well as contextual factors are important for individual preferences and decisions. This insight is of relevance for different kinds of market players to address specific groups, but also certain regions. This suggestion is discussed in detail below. One important implication that can be derived on the basis of these results is that we should have a holistic view with respect to sustainable behaviors and should not consider them separately.

However, as the thesis also considers and reveals potential barriers that prevent individual investors from participating in the SRI market, it also offers paths for practical solutions. While it identifies a large group of investors being interested in SRI, but facing too high information costs to enter the market, it provides empirical evidence that sustainability (or transparency) labels could be a promising solution. Connecting the empirical findings regarding both motives and barriers reveals what should be considered when it comes to developing targeted measures to increase sensitivity, transparency, and finally demand for SRI.

In summary, while this thesis contributes to several strands of literature, it mainly extends empirical research and its findings regarding the importance of non-financial factors, social norms, and individual identity on individual investment decisions in context of SRI. Thereby, it transfers methodological approaches, such as SC experiments, or ideas and frameworks from other research areas (e.g., the theory of participation costs, or the importance of social norms and

identity on individual decisions) to the SRI research areas. In addition, it is the first work in this field that thoroughly examines representative data and the role of labeling schemes for SRI.

What do these results imply practically? Ten years ago, Schrader (2006) argued that information transparency is an important factor for realizing potentials of SRI fund markets. In this context, he mentioned that large retail banks have to play an important role, but found that these banks were not ready for these tasks and performed badly. Where are we today? Of course, growth rates of SRI markets are (still) tremendously high, however, the volumes under management are still relatively small to the conventional investments. The results of this thesis show that there is a large group of interested, i.e. potential financial decision makers, who the state that they would invest in SRI if they received offers by their bank advisor or had more information on SRI. Further, our survey reveals that a majority of financial decisions makers has little trust that banks, particularly big banks, really invest sustainable investments in a sustainable way.[2] Hence, there is still a lot to do in terms of increasing knowledge, providing information, and gaining trust in SRI and its providers. Additionally, anecdotal evidence of myself shows that indeed representatives of banks state that there are several barriers for them to implement marketing of SRI for retail investors. For example, due to the higher degree of complexity, it takes more time to counsel investors about SRI. Also, a large part of financial advisors does not have sufficient knowledge to advice their clients in the area of SRI. Further, there might be discrepancies with respect to the definition of sustainability, i.e. what the bank means and what each private investors understands under the term SRI, which represent legal risks for banks. However, other results of this thesis might encourage retail banks to offensively offer sustainability products. Both SC experiments clearly show that financial decisions makers are willing to sacrifice return in order to invest in SRI. This suggests that banks can reach at least certain investor groups, which are even willing to pay a premium for SRI and thus a compensation for increased consulting fees. Results of the second and third study are further promising with respect to current initiatives on the SRI markets, such as the implementation of sustainability labels.

Coming back to the starting point, namely the need to support policy measures for achieving international and national climate policy goals by an appropriate redirection of money flows, it is

[2] This question was not included on one of the studies mentioned here, but in one practitioner study. The results are available upon request.

also a political task to consider these problems. In order to sensitize individuals for these issues, information campaigns can be used to clarify a holistic picture showing that financial flows are at least as important as other sustainable behaviors. Our results show that a large share of the respondents considers ecological and social/ethical criteria in many decisions in daily life. Hence, transparency guidelines, nudging, addressing certain social norms, and information provision might help to increase acceptance for the development of a greener economy and future policy measures to reach these goals.

Finally, I like to discuss what issues of this thesis might be critical or remain unconsidered, and what is left for future research agendas. First, one could argue that this thesis focus on stated preferences, particularly survey and experimental data. As discussed in section 1.2, real life decisions, and thus revealed preferences are seldom available and are not necessarily superior to the kinds of data analyzed in the four papers of this thesis. Also, as reported in each paper, we provide a wide range of robustness checks showing that the results are stable. Further, in comparison to previous studies, our data are online representative and we are able to include a large range of explanatory variables. Nevertheless, it is interesting to examine whether these results hold in other settings, particularly in context of real investment decisions with real budget constraints. For example, how would people allocate their money if they have to decide between different kinds of (sustainable) activities under budget restrictions? Is there a trade-off between different activities, i.e. do people prefer certain measures like investing in a sustainable firm instead of buying a hybrid car as they perceive one measure as superior than the other in terms of efficiency? In this respect, it is interesting to analyze the attitude-behavior gap which is prone to many stated preferences analyses (e.g., Nilsson, 2008). However, in comparison to previous studies, one should note that we use the broadest set of variables, at the individual level, and partly even combine these results with regional official data (in order to mitigate several potential biases). Thus, so far and to the best of our knowledge, this thesis provides the broadest approach in order to analyze SRI at the individual level.

However, for future research particularly field experiments as the recently published study by Døskeland and Pedersen (2016) are relevant to validate the results of this thesis. This further includes the consideration of real money decisions, i.e. real budget constraints of households, or the inclusion of sustainability criteria in private pension schemes (e.g., Borgers and Pownall,

2014). In this context, it is interesting to examine the question of fiduciary duties of, for example, pension funds (see Sandberg, 2013 for an interesting overview and discussion). With respect to the question of funding of policy measures for achieving international and national climate goals, it is further necessary to reveal individual preferences toward different investment vehicles, such as private participation in infrastructure funds or green bonds. These kinds of investment products could represent promising means to acquire new capital for funding required measures, such as expanding renewable energies and related infrastructure. In contrast, investments in mutual funds or stocks of firms with a high sustainability performance cannot create new money as they only take place at the secondary market, they are especially interesting as they create new capital at the primary market.

Finally, it would be very interesting to create a panel dataset containing individual investment decisions, in terms of portfolio holdings, over time and for different countries. Econometric panel data approaches would help to mitigate the problem of omitted variables, at least in the case of time-invariant variables (e.g., Greene, 2012). Further, it allows to analyze whether certain campaigns or initiatives, such as labels, have an impact on investment individual decisions. Cross-country analysis would be interesting as obviously social norms and cultural aspects affect behavior of individuals, but also companies (e.g., Hilary and Hui, 2009). Hence, at the European level it could be interesting to analyze whether similar instruments work or whether alternative campaigns could be of greater use to enhance demand for SRI.

2. On the relevance of psychological motives, values, and norms for socially responsible investments: An econometric analysis

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Abstract: Based on unique data from a representative computer-based survey among financial decision makers in German households, this paper empirically examines the determinants of socially responsible investments (SRI). Our econometric analysis implies that the perceived financial performance of SRI matters for the shares of investments in SRI among all investments. However, our main result is that psychological motives, values, and norms like warm glow motives and expectations of the social environment are even more relevant and thus have strong significant effects on SRI. This suggests that SRI investors gain strong non-financial utility from sustainable investments. While the membership in Christian churches and the strength of Christian religiosity also seem to be positively correlated with SRI, these correlations become insignificant if other psycho-logical motives, values, and norms are included in the econometric analysis. Furthermore, a left-wing political orientation rather has significant negative effects on SRI.

Keywords: Socially responsible investments; psychological motives; values; social norms; econometric analysis

JEL: G11, M14, Z12

2.1 Introduction

The market for sustainable or socially responsible investments (SRI) (i.e. an investment strategy that is based on environmental, social, and/or ethical screens, e.g., Renneboog et al., 2008a) is still rather small, but has grown very dynamically worldwide during the last decades (e.g., Mollet and Ziegler, 2014). For example, according to US SIF (2014), US assets under management using SRI strategies incorporating environmental, social, and governance (ESG) criteria increased from 166 billion US dollar in 1995 over 3314 billion US dollar in 2012 to 6200 billion US dollar in 2014 so that these assets now account for more than one out of every six dollars under professional management in the USA. Similarly, Eurosif (2012, 2014) reports that the volume of European assets that integrate ESG factors in the financial analysis grew from 639 billion Euro in 2005 to 5200 billion Euro in 2013. While these data for the USA and Europe should not be compared directly due to different SRI categorization schemes, they reveal the increasing popularity of SRI for institutional and private investors. Against this background, academic interest in SRI has strongly increased.

One direction of empirical research examines the performance of SRI or conversely the performance of socially controversial investments such as investments in so-called sin stocks (especially alcohol, tobacco, weapons, gambling), which are excluded in many SRI funds. The corresponding results are mixed. While some studies report positive abnormal returns for specific SRI stocks (e.g., Edmans, 2011; Eccles et al., 2014), which, however, have often become insignificant in recent years (e.g., Bebchuk et al., 2013; Borgers et al., 2015), other studies find either that there is a financial price to be paid for SRI (e.g., Renneboog et al., 2008b; Belghitar et al., 2014) or higher abnormal returns for sin stocks (e.g., Hong and Kacperczyk, 2009; Derwall et al., 2011; Salaber, 2013). The latter results in combination with the increasing SRI market contradict traditional finance models that imply that investments are exclusively based on performance and risk considerations (e.g., Bauer and Smeets, 2015). Therefore, a second direction of empirical research directly examines the motives of SRI investors and especially asks whether SRI investors are really profit-seeking investors (e.g., Derwall et al., 2011) or whether they gain non-financial utility from such investments.

Several studies in fact find that not only risk-return aspects (e.g., reported in Nofsinger and Varma, 2014), but also psychological motives, values, and norms matter for SRI investors. For

example, Riedl and Smeets (2016) show that many investors hold SRI mutual funds, although they expect an unfavorable risk-return relation compared to conventional investments. Bauer and Smeets (2015) reveal that social identification and thus the perception of belonging to a social group is an important factor for several SRI decisions. Their indicator for social identification with SRI comprises several items including a warm glow motive (e.g., Andreoni, 1989, 1990). Other important values and norms refer to religiosity and political values. Religiosity or religious affiliations are strongly correlated with general financial decisions and also specifically with SRI and socially controversial investing, although the empirical results are not completely consistent (e.g., Hood et al., 2014; Borgers et al., 2015). Political preferences (i.e. preferences for left-wing or right-wing parties) are also of high relevance for general financial behavior (e.g., Kaustia and Torstila, 2011) and specifically for SRI and socially controversial investing (e.g., Hong and Kostovetsky, 2012; Hood et al., 2014; Borgers et al., 2015).

This paper examines the determinants of the share of SRI among all investments at the individual level. The empirical analysis is based on unique data from a (online) representative (with respect to age, gender, and place of origin) web based survey among financial decision makers in German households. Our study therefore refers to the country with the third largest European stock market in terms of market capitalization and the largest national economy in Europe. The econometric analysis examines the effects of performance and risk considerations as well as socio-demographic and regional control variables. However, it focuses on the relevance of psychological motives, values, and norms. Our main result is that several motives like environmental values, feelings of warm glow, or social norms of the direct social environment are highly relevant for SRI investors and especially more important than performance and risk considerations. While the effect of religious affiliation is rather negligible, a left-wing political orientation surprisingly has an additional negative effect on SRI.

Our study contributes to three research directions. First, we contribute to the literature on SRI by analyzing the determinants of such investment strategies. While several studies suggest that psychological motives, values, and norms play an important role, many of them only indirectly consider such motives by examining the shunned stock hypothesis, which assumes that SRI investors are values-driven so that sin stocks that are shunned by SRI investors should have higher expected returns (e.g., Renneboog et al., 2008b; Hong and Kacperczyk, 2009; Derwall et

al., 2011) or try to draw some conclusions from money flows into and out of SRI for the role of non-financial utility of the corresponding investors (e.g., Bollen, 2007; Benson and Humphrey, 2008; Renneboog et al., 2011). In line with, for example, Nilsson (2008), Hood et al. (2014), Riedl and Smeets (2016), Bauer and Smeets (2015), and Wins and Zwergel (2016), we directly consider several motives for private SRI investors. We extend these five studies since our empirical analysis is based on data from a representative survey among financial decision makers and not only on investor data from specific banks or fund providers.

Second, we contribute to the literature on the relationship between psychological motives, values, and norms and general sustainable behavior (e.g., Bénabou and Tirole, 2010). Several studies examine the relevance of motives like feelings of warm glow, social pressure, signaling aspects, or environmental values for the general contribution to public goods or specific contributions to charities (e.g., Harbaugh, 1998; Ariely et al., 2009) or pro-environmental behavior like climate protection activities (e.g., Ziegler, 2015; Schwirplies and Ziegler, 2016). However, only a few studies analyze the relationship between such motives and general financial behavior or specifically SRI (or socially controversial investing). Four exceptions are Riedl and Smeets (2016), who use an indicator for social preferences on the basis of a trust game experiment, as well as Nilsson (2008), Bauer and Smeets (2015), and Wins and Zwergel (2016) who use aggregate indicators for pro-social attitudes and social identification. We extend these studies by using data from a representative survey as aforementioned, by disentangling the effects of several single motives, and by additionally analyzing the effects of environmental, religious, and political values.

Third, we contribute to the literature on the relationship between religious and political values and financial decisions. With respect to religious values, previous studies analyze, for example, their effect on risk behavior on financial markets (e.g., Hilary and Hui, 2009; Kumar, 2009; Kumar et al., 2011; Renneboog and Spaenjers, 2012; Shu et al., 2012; Kumar and Page, 2014) or on stock market participation (e.g., Hong et al., 2004; Renneboog and Spaenjers, 2012). Furthermore, a few studies specifically examine the relationship between religiosity and SRI or socially controversial investing (e.g., Salaber, 2013; Hood et al., 2014; Borgers et al., 2015). With respect to political values, a few studies analyze their relationship to general financial behavior such as stock market participation (e.g., Kaustia and Torstila, 2011) or specifically SRI or

socially controversial investing (e.g., Hong and Kostovetsky, 2012; Hood et al., 2014; Borgers et al., 2015). Many of these studies only consider local indicators as proxies for individual religious and political values. Instead, we directly use individual indicators for religious affiliation and party affinity, which is in line with Hong et al. (2004) or Renneboog and Spaenjers (2012), who consider individual religiosity, or Kaustia and Torstila (2011) and Hong and Kostovetsky (2012), who consider individual political preferences, although none of these studies examines further psychological motives, values, and norms as discussed above.

The remainder of the paper is organized as follows: Section 2.2 reviews the related literature and discusses several hypotheses for our empirical analysis. Section 2.3 describes the data and the variables in our econometric analysis. Section 2.4 discusses the estimation results and the final Section 2.5 draws some conclusions.

2.2 Literature review and hypotheses

2.2.1 Psychological motives, values, and norms

So far, the literature on the relationship between psychological motives, values, or norms and SRI or socially controversial investments is scarce. Exceptions are the studies of Nilsson (2008) and Wins and Zwergel (2016), which are based on unrepresentative survey data from Swedish customers of a European mutual fund provider and German investors, respectively. Besides trust in and perceived effectiveness of SRI, the studies examine stated pro-social attitudes in purchasing decisions with respect to, for example, human rights, environmental effects of products and production, or unethical business practices. It is found that these pro-social attitudes have a positive effect on the share of SRI funds among all investments. Bauer and Smeets (2015) analyze the relevance of social identification for SRI and especially consider feelings of warm glow besides other items for social identification with SRI. Their empirical analysis is based on unrepresentative survey data from customers of two banks in the Netherlands that are specialized in SRI. They find that the indicator for social identification has a positive effect on investments in these two SRI banks. Furthermore, Riedl and Smeets (2016) analyze unrepresentative administrative and survey data for investors from a mutual fund provider in the Netherlands. They specifically construct an indicator for social preferences on the basis of a trust game experiment and show that this indicator has a positive effect on the probability that a SRI fund without tax benefits is hold in the portfolio.

However, it should be noted that these four studies only use one aggregated indicator, respectively, and thus cannot disentangle specific effects, for example, of warm glow motives.[3] Instead, the literature on the determinants of general sustainable behavior (e.g., Bénabou and Tirole, 2010) and specifically of the contribution to public goods such as contributions to charities or pro-environmental behavior like climate protection activities discusses several psychological motives. By way of example, Schwirplies and Ziegler (2016) show in their empirical analysis for citizens in Germany and the USA that warm glow motives matter for climate protection activities (i.e. offsetting carbon emissions from conventional consumption or paying higher prices for climate-friendly products). Warm glow (e.g., Andreoni, 1989, 1990; Harbaugh, 1998) can be described as a good feeling, which is experienced through the act of giving and can be considered as a private component of an impure public good. With such feelings of warm glow individuals derive psychological benefits and thus higher utility levels from contributing to public goods or from general sustainable behavior such as SRI. Also in line with the results of Bauer and Smeets (2015), this leads to the following hypothesis that is examined in our econometric analysis:

Hypothesis 1: Feelings of warm glow from SRI are positively correlated with the share of SRI among all investments.

Another dimension of psychological motives for sustainable behavior refers to social pressure or social norms, for example, based on local political or religious values (e.g., Borgers et al., 2015), as discussed below. According to Rege (2004), social norms are behavior rules which indicate what activities are considered as proper or correct or as improper or incorrect by a group of persons (e.g., family, friends, but also the society). Social norms are enforced by social sanctions, i.e. the social environment can punish negative deviations from normative expectations, which leads to psychological losses and thus lower utility levels. In order to avoid such sanctions, individuals adjust their behavior and seek to get social approval and avoid disapproval by complying with the social norms of the group members (e.g., Holländer, 1990; Akerlof and Kranton, 2000; Nyborg and Rege, 2003). Against this background, individuals who generally behave sustainably or specifically invest in SRI may suffer psychological losses and thus lower utility levels if they perceive that the social environment does not behave sustainably and thus

[3] Riedl and Smeets (2016) recognize this and mention that they cannot distinguish between altruism and warm glow motives.

does not invest in SRI. In contrast, individuals derive psychological gains and thus higher utility levels from general sustainable behavior such as SRI if they believe that this behavior is expected by the social environment or the society. Also in line with the results of Schwirplies and Ziegler (2016), who show the relevance of such social norms for specific pro-environmental behaviors (i.e. climate protection activities), this leads to the following hypotheses that are examined in our econometric analysis:

Hypothesis 2a: The perception that the social environment does not invest in SRI is negatively correlated with the share of SRI among all investments.

Hypothesis 2b: The perception that the social environment expects to invest in SRI is positively correlated with the share of SRI among all investments.

Hypothesis 2c: The perception that the society expects to invest in SRI is positively correlated with the share of SRI among all investments.

As discussed above, SRI captures very different categorization schemes and especially refers to social and ethical screens. However, an important subgroup of SRI is only based on ecological criteria. Ecological financial investments such as mutual funds in renewable energies, but also money investments in ecological banks (e.g.; the Umweltbank AG) play an important role in the universe of SRI in Germany. Ecological financial investments are one dimension of individual pro-environmental behavior, which is generally strongly affected by environmental values. For example, Martin and Bateman (2014) show strong positive effects on different practices such as switching products due to environmental issues or recycling glass bottles, jars, or aluminum cans in the USA. Based on another US data set, Attari et al. (2009) reveal positive effects on climate protection activities, i.e. the (stated) purchase of low emission vehicles and the (stated) purchase of green energy from the energy supplier. Furthermore, Kotchen and Moore (2007) find that stronger environmental values increase the participation in several green-electricity programs in Michigan, USA, and Delmas and Lessem (2014) show on the basis of data from a field experiment at the University of California, Los Angeles, USA, some negative effects on electricity use.

Environmental values can obviously be revealed by the individual support of environmental organizations. In fact, Dastrup et al. (2012) find that contributions to environmental organizations are positively correlated with the probability to live in solar homes in San Diego, USA.

According to Kotchen and Moore (2008), individuals who belong to an environmental organization are aware of environmental problems and are also willing to take personal responsibility for addressing the problems. Therefore, they feel guilt from shirking their responsibility. In other words, they could suffer psychological losses and thus lower utility levels if they would not comply with the social norms of the environmental organization. As a consequence, it can be expected that they adjust their behavior toward pro-environmental activities. In fact, Kotchen and Moore (2008) show on the basis of data from Traverse City, Michigan, USA, that the membership in an environmental organization has a positive effect on pro-environmental behavior, i.e. individuals who belong to an environmental organization more often pay a price premium for their electricity to finance a wind turbine and also consume less electricity than non-members. Also in line with the results of Andorfer (2013), who shows on the basis of representative individual data from Germany that environmental values also positively affect pro-social or pro-ethical behavior, measured by (stated) fair trade consumption, this leads to the following hypothesis that is examined in our econometric analysis:

Hypothesis 3: The membership in an environmental organization is positively correlated with the share of SRI among all investments.

2.2.2 Religious values

The empirical literature on the relationship between religious values and general economic and social behavior as well as on the macroeconomic relevance of religious values is extensive (see e.g., the overviews in Hilary and Hui, 2009, Renneboog and Spaenjers, 2012, or Shu et al., 2012). Several studies specifically analyze the relationship between religious values and behavior on financial markets. For example, Hilary and Hui (2009) find that firms that are located in very religious US counties show lower risk exposure. Hong et al. (2004) show on the basis of US household data that individual religiosity is positively correlated with stock market participation. Based on representative Dutch household data, Renneboog and Spaenjers (2012) reveal that both Catholic and Protestant affiliations have a positive effect on money savings and that Catholics are more risk averse and less likely invest in stocks. Several US studies show that investors in counties with a high proportion of Catholics or a low proportion of Protestants are less risk averse (e.g., Shu et al., 2012) or more often invest in lottery-type stocks (e.g., Kumar, 2009). Furthermore, Kumar et al. (2011) and Kumar and Page (2014) show with data from institutional

portfolios in the USA that the weights of lottery-type stocks in these portfolios are higher in the aforementioned regions.

Several studies also examine the relationship between religious values and sustainable behavior, although the results are very ambiguous. Cui et al. (2015) discuss two contradicting hypotheses about the relationship between Christian religiosity and pro-environmental behavior, namely the stewardship hypothesis that implies a positive correlation on the basis of the teachings of the Christian religions and the dominion hypothesis that implies a negative correlation on the basis of the early work of White (1967) who suggests an anthropocentric worldview of Christianity. The empirical analysis of Cui et al. (2015) rather confirms the dominion hypothesis since firms that are located in US counties with high regional shares of Christians and especially Protestants show less environmental practices. In contrast, Martin and Bateman (2014) find that Judeo-Christian religious values have no significant effects on individual pro-environmental behavior in the USA, at least if several control variables are included in the econometric analysis. According to Doran and Natale (2011), the development of pro-social and pro-ethical behavior like the fair trade movement is also strongly supported by religious groups. Nevertheless, their empirical analysis on the basis of individual US data rather implies that religious values are negatively correlated with the consumption of fair trade products. In contrast, Andorfer (2013) shows that individual religiosity has strong positive effects on fair trade consumption in Germany.

With respect to SRI or socially controversial investments, Kumar and Page (2014) additionally show that in counties with a high ratio of Catholics to Protestants the weights of socially controversial stocks (i.e. sin stocks) are higher in the institutional portfolios. The result that the aversion to sin stocks is smaller in regions with higher proportions of Catholics is confirmed in the US studies of Hood et al. (2014) and Borgers et al. (2015). The empirical analysis of Hood et al. (2014) considers whether an individual investor owns at least a sin stock among S&P 500 stocks. They also reveal that high regional shares of Christians are negatively correlated with investments in stocks with progressive policies toward homosexual employees. The study of Borgers et al. (2015) is based on mutual funds and considers the weight of sin stocks in these funds. They also find that not only funds in more Catholic states, but also funds in more Protestant states as well as funds in generally more religious states are more exposed to sin stocks. This latter result is rather surprising since it is widely believed that avoiding investments

in sin stocks has its origins in religion. In addition, Salaber (2013) examines stock returns in a sample of 12 European countries. She shows that sin stocks earn a risk-adjusted premium in Protestant countries (i.e. Scandinavian countries and the UK), but not in Catholic countries (e.g., France, Italy, Spain), which is explained by the higher sin aversion of Protestants. To the best of our knowledge, however, no previous empirical analysis has considered the relationship between religious values and investments that are based on broader concepts of SRI so far.

In fact, it is widely accepted that SRI and especially ethical investing has its roots in religion, i.e. in Jewish, Islamic, and particularly Christian traditions (e.g., Renneboog et al., 2008a). For example, the Religious Society of Friends and Methodists refused to invest in slavery and weapons already in the 18th century (e.g., Louche et al., 2012). Today religious institutions and charities are important SRI investors. In Germany, for example, almost one third of institutional SRI investors (being dominant in the SRI market) are church institutions and charities (e.g., FNG, 2015b). Against this background, the two dominant German Christian churches have developed guidelines for investments in church organizations (e.g., EdK, 2013; ZdK, 2015), which emphasize the relevance of ESG criteria. While these guidelines are primarily targeted at church investments, it can be assumed that they also affect investment decisions of religious private investors in Germany since they generally define theologically justified principles for investments. In other words, Catholics or Protestants and especially very religious Christians could suffer psychological losses and thus lower utility levels if they would not comply with the social norms of the Christian churches. In this respect, it should be noted that individual religiosity (as e.g., considered in Hong et al., 2004; Doran and Natale, 2011; Renneboog and Spaenjers, 2012; Andorfer, 2013) can certainly better capture social norms from churches than only regional religiosity, which is often considered in previous studies, as discussed above. This leads to the following hypotheses that are examined in our econometric analysis:

Hypothesis 4a: The membership in Christian churches is positively correlated with the share of SRI among all investments.

Hypothesis 4b: The strength of Christian religiosity is positively correlated with the share of SRI among all investments.

2.2.3 Political values

Previous empirical studies show that not only religious, but also political values matter for general economic and especially for sustainable behavior. For example, Di Giuli and Kostovetsky (2014) find that US firms are socially more responsible if the CEO, board members, and founders are more affiliated with Democrats and if the headquarters of the firms are in Democratic dominated states. Other studies show that individual and local political orientation has strong effects on individual pro-environmental behavior. For example, Kahn (2007) finds in his analysis that Californian households who live in areas with high shares of Green Party registered voters consume less gasoline, less often own an SUV, and use more often public transit. On the basis of household data in San Diego, USA, Dastrup et al. (2012) find that voters of the Democratic, Peace and Freedom, and Green Parties live much more often in a solar home. Furthermore, Costa and Kahn (2013) reveal that Democratic and Green Party registered voters as well as households in regions with a high proportion of liberal registered voters consume strongly less electricity. Their empirical analysis is based on data from home owners in a Western Region electric utility area of the USA. In sum, most previous studies show that a left-wing political orientation has positive effects on pro-environmental behavior and especially climate protection activities (see also e.g., Ziegler, 2015; Schwirplies and Ziegler, 2016).

So far, only a few studies specifically analyze the relationship between political preferences and financial behavior. Kaustia and Torstila (2011) show that left-wing voters and politicians have lower stock market participations than right-wing voters and politicians. Their empirical analysis is based on several datasets in Finland at the aggregated regional and at the individual level. The relationship between political values and SRI or socially controversial investing is recently examined in Hong and Kostovetsky (2012), Hood et al. (2014), and Borgers et al. (2015). On the basis of data from private US investors, Hood et al. (2014) show that high election results for Democrat candidates in the county are positively correlated with investments in stocks with progressive policies towards homosexual employees. Similarly, Borgers et al. (2015) unexpectedly find that mutual funds in US states with a strong political preference for the Democrats have larger portfolio shares in sin stocks. In addition, Hong and Kostovetsky (2012) reveal with data from US mutual funds that are run by one single money manager that those managers who donate for Democrats (compared to managers who donate for Republicans or do

not donate at all) underweight socially controversial stocks and overweight socially responsible stocks.

However, Hong and Kostovetsky (2012) state that they are not sure about the exact mechanism for the relationship between political values and investment decisions in general and thus also for SRI. Furthermore, to the best of our knowledge, no previous empirical analysis has considered the relationship between political values and investments that are based on broader concepts of SRI so far, especially for European countries. Nevertheless, based on the few previous empirical analyses on the relationship between individual political values and SRI or socially controversial investing in the USA and particularly on the relationship between political values and sustainable behavior in the USA and other countries, we formulate the following hypothesis that is examined in our econometric analysis:

Hypothesis 5: A left-wing political orientation is positively correlated with the share of SRI among all investments.

2.3 Data and variables

The data for our empirical analysis were collected from a computer-based survey among financial decision makers in German households. The survey was carried out between December 2013 and January 2014 by the German market research company GfK SE. The sample was drawn from a representative GfK Online Panel. On this basis, financial decision makers were identified. They are defined as persons who are at least 18 years old, hold at least a savings account, and are mainly or equally responsible for financial decisions in the household. Overall, 1001 respondents participated in the survey. The questions of the questionnaire referred to general investment decisions, specifically to SRI, to other pro-environmental and pro-social attitudes and behaviors, to several norms and values, as well as to socio-demographic and socio-economic variables. The survey also comprised two stated choice experiments with respect to the preferences for several (sustainable) equity funds and (sustainable) fixed interest securities, which are, however, not

considered in this paper.[4] The median for the completion time of the survey was about 18 minutes.

In order to examine sustainable investors, the participants were asked whether they currently hold SRI and/or plan to hold sustainable investments within the next three years. Our empirical analysis only refers to existing investments. In a second step, those financial decision makers who currently hold SRI were asked for the percentage share of SRI among all their investments. The participants had to select one class from six intervals, namely "more than 0% to 20%", "more than 20% to 40%", "more than 40% to 60%", "more than 60% to 80%", "more than 80% to less than 100%", and "100%". Table 1 reports the frequencies of these SRI shares. In line with the existing dominance of investments that are not based on environmental, social, and/or ethical screens, almost 80% of the respondents do not hold sustainable investments. For more than 11% of the financial decision makers the SRI shares range between 0% and 40%, while only 4.5% of the respondents indicate SRI shares between 60% and 100%, and not a single respondent holds nothing else than sustainable investments. For our econometric analysis we summarize the two intervals "more than 60% to 80%" and "more than 80% to less than 100%" to one class and construct an ordinal variable with the resulting five categories that takes the lowest value one if a respondent does not hold sustainable investments and the highest value five if a respondent indicates SRI shares of more than 60%. Furthermore, we consider a dummy variable that takes the value one if a respondent holds SRI (and zero otherwise).

With respect to perceived financial performance of SRI, we consider three indicators. The respondents were asked for their perception of the average level of interest rates or returns, the average level of fees, and the average level of risk for sustainable investments compared to conventional investments including five ordered response categories, i.e. "much lower", "rather lower", "neither lower nor higher", "rather higher", or "much higher", respectively. We construct the three dummy variables "higher perceived returns SRI", "higher perceived fees SRI", and "higher perceived risk SRI" that take the value one if a respondent indicates the two highest categories (i.e. "rather higher" or "much higher"), respectively. In addition to these three variables, we include several socio-demographic control variables in our econometric analysis.

[4] The choice experiment on sustainable equity funds is analyzed in the complementary paper of Gutsche and Zwergel (2016).

The dummy variable “female” takes the value one if a respondent is a woman, while “age” is the age of a respondent in years. Furthermore, the dummy variable “high education” takes the value one if the highest level of education is at least secondary (i.e. high school graduation) and the dummy variable “living together or married” takes the value one for these two marital statuses. We additionally control for regional heterogeneity and thus consider the dummy variable “Western Germany” that takes the value one if a respondent lives in the West German federal states.

The first group of our main explanatory variables refers to several psychological motives, values, and norms. The respondents were asked how strongly they agree with several statements on a symmetric scale with five ordered response categories, i.e. “not at all”, “rather weakly”, “neither weakly nor strongly”, “rather strongly”, and “totally”. The dummy variable “warm glow” takes the value one if a respondent agrees rather strongly or very strongly to the statement “it makes me feel good to invest in sustainable investments” or to the statement “I feel responsible for a sustainable development and want to contribute by sustainable investments”. Furthermore, the dummy variables “no contribution social environment” and “expectation social environment” take the value one if a respondent agrees rather strongly or very strongly to the statements “in my social environment (e.g., family, friends, colleagues) no one holds sustainable investments” and “my social environment (e.g., family, friends, colleagues) expects me to hold sustainable investments”, respectively. In addition, the dummy variable “expectation society” takes the value one if a respondent agrees rather strongly or very strongly to the statement “the society expects me to hold sustainable investments” and the dummy variable “membership environmental organization” takes the value one if a respondent is a member of a group or organization that is engaged in the conservation and protection of the environment and nature.

With respect to religious values, the respondents were asked whether they belong to nine specific religious communities, to other religious communities, or whether they are without religious affiliation. We construct the dummy variables “Catholic affiliation” and “Protestant affiliation” that take the values one if a respondent belongs to the Roman Catholic Church and to Protestant Churches, respectively. Due to the dominance of these two Christian churches in Germany, only very few financial decision makers in our sample belong to other religious communities. Therefore, we construct the dummy variable “affiliation other religious groups” that takes the

value one if a respondent belongs to another specific religious community, i.e. to the Islam, Orthodox Churches, New Apostolic Churches, Buddhism, Judaism, Jehovah's Witnesses, Hinduism, or other religious communities. While the numbers of members of these religious communities are too low to analyze them specifically, the inclusion of these three dummy variables in the econometric analysis allows us to examine the relevance of the membership in the two dominating Christian churches compared to the base group of respondents without religious affiliation. Furthermore, all respondents who belong to a religious community were asked for the number of days per week they actively pursue their denomination (e.g., praying) on average. In order to analyze the strength of Christian religiosity, we construct the dummy variable "Christian religiosity" that takes the value one if a respondent that belongs to the Roman Catholic Church or to Protestant Churches pursues her denomination at least at one day per week on average.

In order to analyze political orientation, the respondents were asked with which political party they are most likely affiliated, even when they occasionally vote for another party. The questionnaire comprised the seven dominating political parties in Germany, namely the Christian Democrats (CDU/CSU), the Social Democrats (SPD), the Liberals (FDP), the Green Party (Bündnis 90 / Die Grünen), Left Party (Die Linke), the main right-wing party (AfD), the Pirate Party (Piratenpartei), and "another party". In order to analyze the relevance of a left-wing political identification, we construct the dummy variable "affinity left-wing parties" that takes the value one if a respondent is mainly affiliated with the Social Democrats, the Green Party, or the Left Party. Table 2 reports the numbers of observation and the means for the explanatory variables in our econometric analysis.

2.4 Econometric analysis

2.4.1 Basic estimation results

While Table 3 reports the results of Maximum Likelihood (ML) estimations of ordered probit models for the determinants of the five categories of SRI shares among all investments, Table 4 reports the corresponding ML estimations of parameters in binary probit models for the

determinants of being currently invested in SRI.[5] The estimation results in both tables are based on the same structure of seven different model specifications. We consider different models to disentangle effects of psychological motives, values, and norms as well as specific religious and political values which can be correlated.[6] The base models only include the three indicators for the perceived financial performance of SRI and several control variables. The second model specifications additionally incorporate the five variables for psychological motives, values, and norms. In addition to the explanatory variables in the base models, the third models include the three variables for religious membership, while the fourth models include the indicator for the strength of Christian religiosity besides the variable for the affiliation to other religious groups. The fifth model specifications incorporate the explanatory variables in the base model plus the indicator for the affinity to left-wing parties. The final two full model specifications incorporate all variables for psychological motives, values, and norms as well as specific religious and political values, where the sixth models refer to the inclusion of the three indicators for the membership to religious communities, and the seventh models refer to the inclusion of the indicator for the strength of Christian religiosity besides the variable for the affiliation to other religious groups.

The first columns of Table 3 and Table 4 reveal that perceptions of the financial performance of SRI obviously matter. In line with the economic self-interest of profit-seeking investors, the perception of higher SRI returns has significantly positive and higher perceived fees and risk of SRI have significantly negative effects on the share of SRI among all investments.[7] According to the third and fourth columns of both tables, these effects remain significant if religious values are

[5] All estimations (and also all descriptive statistics as discussed above) were conducted with the statistical software package Stata. We consider heteroscedasticity-robust estimates of the standard deviations of the estimated parameters according to White (1982) and thus heteroscedasticity-robust z-statistics.

[6] For example, the correlation coefficient between "Christian religiosity" and "membership environmental organization" is 0.11 and the corresponding correlation coefficient between "Christian religiosity" and "warm glow" is 0.15.

[7] With respect to the interpretation of the estimation results in ordered probit models, we use such simpler phrases for brevity in the following. We thus abstain from the specific interpretation in the case of a significantly positive parameter estimate that the corresponding variable is significantly positively correlated with increasing values of the ordinal dependent variable (i.e. with an increasing share of SRI among all investment). Furthermore, we do not point in this case to the significantly positive correlation with the highest category of the dependent variable (a share of SRI among all investments of more than 60%) and the significantly negative correlation with the lowest category of the dependent variable (no SRI among all investments). Specific effects on different categories of the ordinal dependent variable are discussed in section 2.4.3.

included as additional explanatory variables. These effects become weaker or even insignificant if the other main explanatory variables are incorporated. According to the fifth column of Table 4, the parameter of "higher perceived returns SRI" is not significantly different from zero if "affinity left-wing parties" is included as additional explanatory variable. However, the inclusion of the five variables for psychological motives, values, and norms reveals that these variables have even stronger effects. In this case, higher perceived returns of sustainable investments never have significant effects. If all variables for psychological motives, values, and norms as well as specific religious and political values are incorporated in the seventh model specification, only the parameter of "higher perceived fees SRI" is weakly significantly different from zero in the ordered probit model, whereas no variable for the perceived financial performance of SRI has a significant effect in the binary probit model.

The insignificant effect of higher perceived risk of SRI is in line with the results of Nilsson (2008), Riedl and Smeets (2016), and Wins and Zwergel (2016). Our estimation results for higher perceived returns and risk of SRI are also widely in line with Bauer and Smeets (2015), who find that these two indicators have strong significant effects on sustainable investments if only one of them is included in the econometric analysis. Furthermore, the effect of higher perceived risk of SRI also becomes insignificant if further explanatory variables and especially their indicator for social identification are incorporated. In line with Bauer and Smeets (2015), this suggests that while higher perceived risk of SRI does matter for sustainable investments, the relevance of psychological motives, values, and norms is obviously stronger. With respect to higher perceived returns of SRI, however, Bauer and Smeets (2015) as well as Nilsson (2008) report significant effects in their full econometric models, whereas our estimation results reveal insignificant effects, which is in line with Riedl and Smeets (2016) and Wins and Zwergel (2016). In addition, it seems that higher perceived fees of SRI, which are not considered in the four studies, are obviously the most robust indicator for the perceived financial performance of SRI for the explanation of sustainable investments.

The main results refer to the estimated effects of the five variables for psychological motives, values, and norms. According to Table 3, warm glow motives, the perception that the social environment expects to invest in SRI, the perception that the society expects to invest in SRI, as well as the membership in an environmental organization are significantly positively correlated

with the share of SRI among all investments. Furthermore, the perception that the social environment does not invest in SRI is significantly negatively correlated with the share of sustainable investments. These effects do not only hold in the model specification that only includes these five variables besides the three indicators for the perceived financial performance of SRI and the control variables (see the second column), but also in the models that additionally incorporate the indicators for religious and political values (see the sixth and seventh column). This means that these estimated effects are clearly more robust than the estimated effects of the three variables for the perceived financial performance of SRI, as discussed above. Table 4 reveals that these estimation results are widely confirmed in our binary probit models. The only exception refers to the effect of "expectation society" which is insignificant in two of the three model specifications (see the second and seventh column).

According to these estimation results, Hypotheses 1, 2a, 2b, and 3 can be strongly confirmed, whereas Hypothesis 2c can only be partly confirmed. Our estimation results are thus widely in line with Nilsson (2008) and Wins and Zwergel (2016), who reveal that pro-social attitudes have a positive effect, with Riedl and Smeets (2016), who find that social preferences have a positive effect, and with Bauer and Smeets (2015), who show that social identification has a positive effect on SRI, as discussed above. However, in contrast to these previous studies, our econometric analysis reveals that not only single aggregated indicators, but also several disaggregated motives separately strongly matter, at least for German financial decision makers. Our estimated effects for the compliance with social norms of the direct social environment and especially of warm glow motives are in line with the literature on the determinants of sustainable behavior or the general contribution to public goods such as contributions to charities or pro-environmental behavior (e.g., Schwirplies and Ziegler, 2016) and thus suggest that SRI are based on similar stimuli. Furthermore, our estimated effects of the membership in an environmental organization are in line with its relevance (e.g., Kotchen and Moore, 2008; Dastrup et al., 2012) or the relevance of general environmental values (e.g., Kotchen and Moore, 2007; Attari et al., 2009; Delmas and Lessem, 2014; Martin and Bateman, 2014) for pro-environmental behavior.

The third columns of Table 3 and Table 4 show that while a Protestant affiliation is not significantly correlated with the share of SRI among all investments, a Catholic affiliation has a significantly positive effect. Furthermore, the fourth columns reveal a significantly positive effect

of our indicator for the strength of Christian religiosity. These estimation results would clearly confirm Hypotheses 4a and 4b. However, the sixth and seventh columns reveal that all parameters of religious values become insignificantly different from zero if the indicator for the affinity to left-wing parties and especially the five variables for psychological motives, values, and norms are included. These estimation results suggest that while religious values do matter for sustainable investments, the relevance of further psychological motives, values, and norms is obviously stronger. As a consequence, Hypotheses 4a and 4b cannot unequivocally be confirmed. Therefore, our results are not completely in line with previous studies that find several significant correlations between religious values and SRI or socially controversial investments (e.g., Salaber, 2013; Hood et al., 2014; Kumar and Page, 2014; Borgers et al., 2015). One possible reason for these different results is the use of different concepts of dependent and explanatory variables since we consider individual instead of regional indicators for religious values and broader concepts of SRI instead of narrower dimensions such as sin stocks. Another possible explanation for the different results is that previous econometric analyses might be biased due to the omission of important explanatory variables, i.e. further psychological motives, values, and norms.

The fifth columns of Table 3 and Table 4 show that the affinity with left-wing parties is not significantly correlated with the share of SRI among all investments. Therefore, Hypothesis 5 cannot be confirmed. In contrast to our expectations, the sixth columns even reveal a significantly negative effect of the corresponding variable, which actually suggests a rejection of Hypothesis 5. We have also analyzed model specifications that include separate dummy variables for an affinity with Social Democrats, the Green Party, and the Left Party instead of the aggregated indicator for the affinity with these three left-wing parties. The corresponding estimation results show that this effect is mainly triggered by significantly negative effects of a Left Party affinity, weakly supported by some significantly negative effects of a Green Party affinity, but obviously not strongly triggered by an affinity with Social Democrats.[8] Therefore, our estimation results contradict previous empirical analyses on the relationship between individual political values and SRI in the USA (e.g., Hong and Kostovetsky, 2012; Hood et al., 2014; Borgers et al., 2015) and particularly on the relationship between political values and sustainable behavior in the USA and

[8] The estimation results are not reported due to brevity, but are available upon request.

other countries (e.g., Kahn, 2007; Dastrup et al., 2012; Costa and Kahn, 2013; Di Giuli and Kostovetsky, 2014; Ziegler, 2015; Schwirplies and Ziegler, 2016).

One explanation for these contradictory results (besides the differences in the construction of the dependent and explanatory variables in the econometric analyses) might be the strong stock market aversion of left-wing oriented individuals in Europe and especially in Germany. This aversion is shown in the study of Kaustia and Torstila (2011) for Finland, as discussed above, and also partly confirmed on the basis of our German dataset.[9] A general skepticism toward financial markets can also be found in the election programs of the Social Democrats, the Green Party, and the Left Party for the German federal elections 2013. If sustainable investments are mainly combined with equity funds or other risky investments, but left-wing oriented financial decision makers rather prefer riskless investments like savings accounts ("Sparbücher") or time deposits and are more skeptical toward general equity investments than toward non-sustainable investments, negative effects of a left-wing orientation are possible. Another explanation for our rather surprising estimation results is that left-wing oriented individuals in Germany generally might not consider SRI as an appropriate direction for sustainable behavior in contrast to other pro-social or pro-environmental behaviors like climate protection activities, as shown in previous studies (e.g., Ziegler, 2015; Schwirplies and Ziegler, 2016).

Finally, Table 3 and Table 4 reveal that no control variable has robust significant effects on the share of SRI among all investments. Only sporadically the positively estimated parameters for "living together or married" and for the regional variable "Western Germany" are significantly different from zero.

2.4.2 Robustness checks

In order to test the robustness of our estimation results, we examine alternative ordinal dependent variables for the shares of SRI among all investments. In contrast to the aggregated two intervals "more than 60% to 80%" and "more than 80% to less than 100%" in the ordered probit models so far, we now disaggregate this summarized class and construct an ordinal dependent variable with all six categories for which the frequencies are greater than zero (see Table 1). The first two columns of Table 5 report the results of the ML estimations in these ordered probit models. The

[9] The corresponding estimation results are not reported due to brevity, but are available upon request.

underlying model specifications are in line with the corresponding full model specifications that are the basis for the estimation results in the sixth and seventh columns of Table 3. These two columns of Table 5 reveal qualitatively almost identical estimation results as the two last columns of Table 3, which especially supports the strong relevance of psychological motives, values, and norms. By aggregating the intervals "more than 0% to 20%", "more than 20% to 40%", and "more than 40% to 60%" to one class and the intervals "more than 60% to 80%" and "more than 80% to less than 100%" to another class, we have also constructed an additional ordinal dependent variable with only three categories. The corresponding results of ML estimations are qualitatively extremely similar to the estimation results in the last two columns of Table 3, the first two columns of Table 5 , and also the last two columns of Table 4.[10]

With respect to the estimation results in the last two columns of Table 3 and Table 4, it might be argued that the lower numbers of observations, which are due to several missing values for some variables, are problematic. However, the comparison of the descriptive statistics for these smaller estimation samples with the descriptive statistics in Table 1 and Table 2 mostly show very small differences in the frequencies of SRI shares among all investments and the means of the explanatory variables. The share of respondents with no SRI only slightly decreases from about 79% (see Table 1) to about 74% in the estimation samples. Two exceptions for the explanatory variables are the decreasing proportion of women (by about ten percentage points) and the increasing mean for the variable "warm glow" (by up to ten percentage points) in the estimation samples.[11] However, due to the consequent inclusion of these control variables in our econometric analysis, systematic selection biases cannot be expected. Moreover, we have also analyzed further socio-demographic and socio-economic variables, which refer to the household structure (i.e. household size, number of children in the household), alternative education and marital status variables, and especially household income. However, none of these variables has robust effects on the share of SRI among all investments. In particular, the inclusion of these

[10] These estimation results are not reported due to brevity, but are available upon request. The similarity to the estimation results in the binary probit models is not very surprising due to the similarity of this ordinal dependent variable with three categories to the binary dependent variable with two categories.

[11] These descriptive statistics are not reported due to brevity, but are available upon request

control variables does not change our main estimation results, i.e. the strong relevance of psychological motives, values, and norms.[12]

In line with Bauer and Smeets (2015), we additionally examine model specifications that include missing values for the perceptions about the financial performance of SRI. Therefore, we construct the three dummy variables "missing values perceived returns SRI", "missing values perceived fees SRI", and "missing values perceived risk SRI" that take the value one if a respondent does not indicate a perception for the returns, fees, and risk of SRI, respectively, and include these variables besides the dummy variables "higher perceived returns SRI with missing values", "higher perceived fees SRI with missing values", and "higher perceived risk SRI with missing values". In order to increase the estimation sample, we additionally carry out the same procedure for the left-wing political identification, which leads to the two dummy variables "affinity left-wing parties with missing values" and "missing values party affinity". The third and fourth columns of Table 5 report the corresponding ML estimations in the ordered probit models with five categories of SRI shares among all investments which are in line with the model specifications that are the basis for the estimation results in the sixth and seventh columns of Table 3. Furthermore, the last two columns of Table 5 report the corresponding ML estimations in the binary probit models which are in line with the model specifications that are the basis for the estimation results in the sixth and seventh columns of Table 4.

The last four columns of Table 5 strengthen our main estimation results for the high relevance of psychological motives, values, and norms. In line with the estimation results in Table 3 and Table 4, warm glow motives, the perception that the social environment expects to invest in SRI, and the membership in an environmental organization are significantly positively correlated, while the perception that the social environment does not invest in SRI is significantly negatively correlated with sustainable investments. The last two columns of Table 5 furthermore reveal that the perception that the society expects to invest in SRI has no significant effect on sustainable investments in these binary probit models that include missing values, which is also completely in line with the estimation results in the last column of Table 4. In addition, the insignificant effects of religious values are confirmed, while the estimation results in the last four columns of Table 5 suggest a stronger evidence for the negative effect of an affinity with left-wing parties on

[12] These estimation results are not reported due to brevity, but are available upon request.

sustainable investments, which strengthens the rejection of Hypothesis 5. Similarly, the significance of the effects of perceptions of the financial performance of SRI is slightly higher in the models that include missing values (especially with respect to higher perceived returns of SRI in the ordered probit models) compared to the models that exclude missing values. However, these slight differences do not alter the main result that psychological motives, values, and norms are more relevant for sustainable investments than perceptions of the financial performance of SRI.

As a final robustness check, we have analyzed alternative econometric models and estimation procedures. In line with Bauer and Smeets (2015), we have calculated the midpoints for each of the five intervals for the shares of SRI among all investments (i.e. 10%, 30%, 50%, 70%, 90%). Together with the value 0% for financial decision makers who do not hold SRI among all their investments, the values have been treated as continuous dependent variables and included in linear regression models and also Tobit models. While this procedure is not unproblematic due to the use of these interval midpoints which can more or less deviate from the true shares of SRI among all investments, the corresponding ordinary least squares (OLS) estimations in the case of linear regression models and ML estimations in the case of Tobit models provide very similar results and especially confirm the strong relevance of psychological motives, values, and norms for sustainable investments.[13]

2.4.3 Economic significance

While our main estimation results are extremely robust, they do not clarify whether the effects of psychological motives, values, and norms on sustainable investments are only statistically significant or also economically relevant. Against this background, we examine the estimations of the average marginal (in the case of the variable "age") and especially the discrete probability effects of the explanatory variables in several specifications of ordered and binary probit models. The results in Table 6 refer to the ordered and binary probit models that only include the three variables for the perceived financial performance of SRI and the control variables and thus to the estimation results in the first columns of Table 3 and Table 4, respectively. The result in Table 7 refer to the full specifications of ordered and binary probit models without missing values and thus to the estimation results in the last two columns of Table 3 and Table 4, respectively.

[13] These estimation results are not reported due to brevity, but are available upon request.

Finally, the results in Table 8 refer to the full specifications of ordered and binary probit models including missing values and thus to the estimation results in the last four columns of Table 5, respectively. All three tables only report significant probability effects (considering at least the 10% significance level).

As discussed in section 2.4.1, the sign of the estimated parameters in ordered probit models only allow conclusions for the direction of estimated effects for the lowest and highest categories of the dependent variables, but not for the categories in between. Therefore, we consider the estimated effects for the second category of the dependent variables (i.e. a share of SRI among all investments of more than 0% to 20%) besides the estimated effects for the first and fifth categories (i.e. no SRI among all investments and a share of SRI among all investments of more than 60%). The three tables reveal that all significant probability effects switch the direction between the first and second categories. This suggests that our explanatory variables are mainly relevant for the choice between any SRI or no SRI among their investments, whereas they seem to be less relevant for the choice of the size of SRI shares. Furthermore, these results strengthen the additional analysis of binary probit models which only distinguish between these two main alternatives.

With respect to the strongest effects of the perceived financial performance of SRI, Table 6 reveals that the estimated average probability for no SRI among all investments is 18 percentage points (in the ordered probit model, see the first column) and 15 percentage points (in the binary probit model, see the fourth column) lower if respondents perceive higher SRI returns. This corresponds to an estimated average probability for no SRI that is more than 31% (in the ordered probit model) and almost 25% (in the binary probit model) higher for respondents who do not perceive higher returns for sustainable investments. While these estimated probability effects are certainly not negligible, they are based on the restricted model specifications that do not include our variables for psychological motives, values, and norms as well as specific religious and political values. On the basis of the full model specifications, Table 7 and Table 8 report smaller estimated average probability effects. According to Table 7, the largest value is nine percentage points for the estimated positive effect of “higher perceived fees SRI” on the choice of the first category in the ordered probit model that includes the three indicators for the membership to religious communities (see the first column). Table 8 reveals that the largest value is 12

percentage points for the estimated negative effect of higher perceived SRI returns on the choice of the first category in the ordered probit model that also includes the three indicators for the membership to religious communities (see the first column).

We now compare these results with the estimated probability effects for the other variables. While no variable for Christian religious values has any significant effect, Table 7 and Table 8 show that the strength of the estimated effects of an affinity with left-wing parties is similar to the strongest estimated effects of the perceived financial performance of SRI. According to Table 7, the estimated average probability for no SRI among all investments is eight percentage points (in the ordered probit model, see the first column) and nine percentage points (in the binary probit model, see the seventh column) lower for a left-wing orientation. Table 8 even reveals values of ten percentage points (see the first column) and eleven percentage points (see the seventh column) if missing values are included in the ordered and binary probit models. This suggests that the effect of political values is obviously at least as relevant as the effect of the perceived financial performance of SRI on the share of SRI among all investments.

However, the estimated probability effects of our five variables for psychological motives, values, and norms, and especially feelings of warm glow and the expectation of the social environment are even more relevant. The estimated negative average probability effects of "warm glow" on no SRI among all investments vary between 15 percentage points in several ordered and binary probit models (see Table 7, fourth and eighth columns, Table 8, fourth and eighth columns) and 17 percentage points in the ordered probit model without missing values that includes the three indicators for the membership to religious communities (see Table 7, first column). The corresponding estimated negative average probability effects of "expectation social environment" vary between 17 percentage points in the ordered probit model with missing values that includes the indicator for the strength of Christian religiosity (see Table 8, fourth column) and even 24 percentage points in the two binary probit models without missing values (see Table 7, last two columns). The latter values imply that the estimated average probability for any SRI is about 110% higher for respondents who perceive that the social environment expects to invest in SRI. In sum, our results therefore suggest a very strong economic relevance of psychological motives, values, and norms on sustainable investments, which is clearly more important than the perceived financial performance of SRI.

The dimension of these estimated average probability effects also become clear by considering the second and fifth categories in the ordered probit models, which seem to be rather small, but are in fact also immense if the underlying small estimated probabilities are considered. For example, the value of nine percentage points for the estimated average probability effect of "expectation social environment" in the ordered probit model without missing values that includes the three indicators for the membership to religious communities (see Table 7, third column) corresponds to an estimated average probability for a share of SRI among all investments of more than 60% that is 206% higher for respondents who perceive that the social environment expects to invest in SRI. A final striking illustration of the strong relevance of our non-financial variables is based on the comparison of the estimated average probabilities for the case that none of the psychological motives, values, and norms play a role[14] and the case that all these psychological motives, values, and norms indeed play a role.[15] For example, the corresponding estimated average probabilities in the ordered probit model without missing values that includes the three indicators for the membership to religious communities (see Table 7, first column) are 0.1835 and 0.9187, which means that the estimated average probability for no SRI is more than 73 percentage points and thus more than 400% higher for respondents for whom none of the psychological motives, values, and norms play a role.

2.5 Discussion and conclusions

This paper empirically examines the determinants of SRI. The study is based on data from a computer-based survey among financial decision makers in German households. In line with the economic self-interest of profit-seeking investors, our econometric analysis implies that the perceived financial performance of SRI matter, i.e. the perception of higher SRI returns has significantly positive and higher perceived fees and risk of SRI have significantly negative effects on the share of SRI among all investments. However, these estimation results are mainly based on model specifications that only include a restricted number of explanatory variables. Econometric analyses that additionally include psychological motives, values, and norms reveal

[14] This means "warm glow" = "expectation social environment" = "expectation society" = "membership environmental organization" = 0 and "no contribution social environment" = 1.

[15] This means that "warm glow" = "expectation social environment" = "expectation society" = "membership environmental organization" = 1 and "no contribution social environment" = 0.

that the effects of these non-financial variables are economically more relevant and more robust, i.e. warm glow motives, the perception that the social environment expects to invest in SRI, and the membership in an environmental organization are strongly positively correlated, while the perception that the social environment does not invest in SRI is strongly negatively correlated with sustainable investments. This suggests that SRI investors gain strong non-financial utility from sustainable investments.

The different estimation results on the basis of more or less restrictive econometric models point to a general problem of previous empirical studies on the determinants of SRI, namely the exclusion of relevant explanatory variables. To the best of our knowledge, our econometric analysis is based on the inclusion of the widest range of explanatory variables so far. While Nilsson (2008) and Wins and Zwergel (2016) and especially Riedl and Smeets (2016) and Bauer and Smeets (2015) analyze several motives besides perceived financial performance of SRI, they only use a small number of aggregated indicators. Therefore (as already recognized by Riedl and Smeets, 2016), they cannot disentangle specific effects, for example, of warm glow motives or social norms by the social environment. In addition, this can obviously also lead to omitted variable biases. Our econometric result especially reveals this problem for the effects of religious values. While a Catholic affiliation and the strength of Christian religiosity has significantly positive effects in restricted econometric models, they become insignificant in models that additionally include the aforementioned psychological motives, values, and norms. This suggests that the effects of motives like feelings of warm glow or the perception that the social environment expects to invest in SRI are not only more robust than the perceived financial performance of SRI, but also than religious values.

In contrast, a left-wing political orientation, i.e. an affinity with Social Democrats, the Green Party, or the Left Party, has relatively robust significantly negative effects on SRI. These estimation results contradict previous empirical analyses on the relationship between political values and SRI or socially controversial investing (e.g., Borgers et al., 2015) and on the relationship between political values and sustainable behavior (e.g., Costa and Kahn, 2013; Schwirplies and Ziegler, 2016). Therefore, it can be speculated that left-wing oriented individuals in Germany generally do not consider SRI as an appropriate direction for sustainable behavior, which is in contrast to other pro-social or pro-environmental behaviors. Another explanation for

our surprising estimation results is the general aversion of a left-wing identification to the participation in stock markets. If sustainable investments are mainly combined with risky investments, but left-wing oriented financial decision makers rather prefer riskless investments and are more skeptical toward general equity investments than toward non-sustainable investments, negative effects of a left-wing orientation are possible. A deeper analysis of the relationship between political values and SRI in Germany and other countries is certainly an interesting direction for further research. As also mentioned in Riedl and Smeets (2016), another direction for future studies is the additional inclusion of further motives, values, and norms such as general risk aversion, reciprocity, or inequality aversion. On this basis, it can be examined whether our main estimation results remain stable or are possibly distorted by omitted variable biases.

Our estimation results have important implications for banks and other providers of financial investments in order to attract SRI investors. Due to the higher relevance of psychological motives, values, and norms, marketing strategies that are too much focused on the financial performance of SRI can possibly be less successful than advertisements that target feelings of warm glow, social norms by the social environment, or also environmental values. It would certainly be very interesting to test the success of such specific marketing strategies in field experiments, where the investment behavior of a randomly selected group of financial decision makers that is manipulated by such specific marketing strategies is compared with the investment behavior of another unmanipulated group. However, such field experiments require the direct cooperation with banks or other providers of financial investments and are thus left for future research.

3. Are private investors willing to pay for sustainable investments? A stated choice experiment

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Abstract: This paper examines the willingness of private financial decisions makers to pay for socially responsible investments (SRI). Our empirical analysis is based on unique data from a representative computer-based survey in Germany that especially comprised two stated choice experiments. The experiments referred to choices among several mutual funds and among several three-year fixed-interest rate investment products and especially comprised sustainability criteria and financial performance indictors as main attributes. Our econometric analysis with flexible mixed logit models reveals strong stated preferences and thus a considerable willingness to pay for sustainable investments. For example, the estimated average willingness to sacrifice yearly interest rates in sustainable fixed-interest investment products amounts to 0.21 percentage points among a variation between 1.30% and 2.10%. These results are very stable across several robustness checks that also include different techniques to mitigate possible hypothetical biases. Our latent class logit model analysis reveals that specific social values and norms play an important role. Investor groups with high feelings of warm glow from SRI, strong considerations of norms by the social environment with respect to SRI, strong environmental values, and an affinity to left-wing parties have a substantially higher estimated average willingness to pay for sustainable investments.

Keywords: Socially responsible investments; stated choice experiments; mixed logit models: latent class logit models; willingness to pay; social values and norms

JEL: G11, Q56, M14, G02, A13, C25

3.1 Introduction

Sustainable or socially responsible investments (SRI) play an increasing role on financial markets, especially in the USA (e.g., US SIF, 2014) and Europe (e.g., Eurosif, 2014). This type of investments takes into account environmental, social, and/or ethical concerns (e.g., Derwall et al., 2011; Døskeland and Pedersen, 2016). The principle of sustainable investments can be based on negative screens, whereby certain investments are avoided such as in the case of so-called sin stocks (especially alcohol, tobacco, weapons, gambling) (e.g., Barreda-Tarrazona et al., 2011), on positive screens, whereby only specific firms are included in the investment universe (e.g., firms from the environmental industry), and/or on best-in-class screens, whereby sustainability leaders from each sector are identified such as in the case of the Dow Jones Sustainability Indexes (e.g., Oberndorfer et al., 2013). According to traditional finance theory, SRI would only be considered if they are at least as attractive as other investments in terms of risk and returns (e.g., Bauer and Smeets, 2015). In fact, some studies (e.g., Derwall et al., 2005; Kempf and Osthoff, 2007; Edmans, 2011; Eccles et al., 2014) show that sustainable investments are financially worthwhile.

However, other analyses find either that there is a financial price to be paid for SRI (e.g., Belghitar et al., 2014) or higher abnormal returns for sin stocks (e.g., Hong and Kacperczyk, 2009; Derwall et al., 2011). Therefore, a series of studies examines whether also non-financial motives are relevant for sustainable investments and thus whether investors are (on average) willing to pay for SRI (i.e. sacrifice returns). For example, Renneboog et al. (2011) show that money flows of SRI funds are less related to past returns than conventional fund flows. Two further studies of money flows for SRI funds (Bollen, 2007; Benson and Humphrey, 2008) also suggest that SRI investors are less concerned about returns than conventional investors so that non-financial motives obviously matter. Another argument for the relevance of non-financial motives is based on the so-called shunned-stock hypothesis in the context of sustainable investments, which suggests that unsustainable stocks such as sin stocks have higher expected returns since a group of investors (which must not be too small, e.g., Heinkel et al., 2001) shun these stocks due to personal values and/or social norms (e.g., Borgers et al., 2015). Therefore, the significantly positive abnormal returns in, for example, Fabozzi et al. (2008), Hong and Kacperczyk (2009), or Derwall et al. (2011) support the validity of the shunned-stock hypothesis and thus the relevance of non-financial motives for SRI.

However, these studies are no direct analyses of the motives for SRI at the individual level. Against this background, another strand of the literature econometrically examines the relevance of financial versus non-financial motives of investors for SRI. Most of these studies (e.g., Nilsson, 2008; Bauer and Smeets, 2015; Gutsche et al., 2016; Riedl and Smeets, 2016; Wins and Zwergel, 2016) consider perceived risk and returns of SRI besides several indicators for social values and norms. While Nilsson (2008), Bauer and Smeets (2015), and Wins and Zwergel (2016) use unrepresentative survey data from Swedish, Dutch, and German investors, the study of Gutsche et al. (2016) is based on data from a representative survey among financial decision makers in Germany. Furthermore, the study of Riedl and Smeets (2016) is based on unrepresentative administrative investor data from a mutual fund provider in the Netherlands, which are combined with additional survey and experimental data for these investors. The five studies report insignificant effects of perceived risk and inconsistent and rather weak effects of perceived returns on SRI, but a strong relevance of social values and norms.

While these studies also support the high relevance of non-financial motives for SRI, none of them directly consider the WTP for sustainable investments. In fact, the estimation of WTP on the basis of perceived or expected returns would be extremely vague and thus unreliable. But even the use of real returns of funds is highly problematic. While the corresponding studies on money flows suggest that investors consider past returns for their investment decision, it is not clear whether these returns persist in the future (e.g., Benson and Humphrey, 2008). Therefore, the WTP for SRI which indicates the amount of return investors are willing to sacrifice for the sustainable component can, strictly speaking, not be estimated for funds or other investments without fixed returns since the amount of money that is possibly sacrificed is ambiguous. Instead, the estimation of this WTP is obviously only reliable on the basis of data for investments with fixed returns. To the best of our knowledge, however, the WTP has not been estimated on the basis of corresponding real market data so far. In fact, this is not very surprising since such empirical analyses require specific data and especially panel data in order to receive reliable estimation results.

Against this background, several studies are based on stated preferences (SP) data, which refer to stated choices for hypothetical situations (e.g., Hensher et al., 2010). SP data are useful for the analysis of preferences for new products, new attributes of products, or products with a low

market penetration. These analyses in the context of sustainable investments can be very simple. For example, Dorfleitner and Utz (2014) and Borgers and Pownall (2014) directly asked their German and Dutch participants, how much return they would sacrifice for a sustainable investment. Furthermore, Lewis and Mackenzie (2000) presented different scenarios comprising one sustainable and one conventional investment product with different returns to ethical investors in the UK and asked them for their preference. In order to make hypothetical scenarios more realistic, Webley et al. (2001) use data from an experimental survey of, however, only 56 British investors, where the participants had to make decisions about their real investment portfolio in several scenarios that vary in the future financial performance of sustainable and conventional investments. Pasewark and Riley (2010) asked students to make a hypothetical investment of 10000 US dollars either in a sustainable bond (i.e. a non-tobacco firm) or in an unsustainable bond (i.e. a tobacco firm) which differ in the fixed interest rates.

Two recent SP experiments, which try to further increase the closeness to reality can be found in Barreda-Tarrazona et al. (2011) and Berry and Yeung (2013). Barreda-Tarrazona et al. (2011) use data from a laboratory experiment with Spanish students, which especially includes monetary incentives, i.e. the participants had to invest real money in real existing mutual funds. However, the used amount of individual investments is rather small (16 euro). Furthermore, major shortcomings of their approach are the artificial and thus also hypothetical scenarios for risk and return of the funds and the only consideration of past returns so that the future return and thus the future payments are uncertain for the participants, as discussed above. Recently, Berry and Yeung (2013) analyze data from an SP experiment with a small sample of British ethical investors, where the participants had to select one of five selected percentages between 0% and 15% from a hypothetical portfolio of 100000 British pounds for ten investment opportunities with different levels of financial performance and sustainability. However, a main concern of this study and other previous studies refers to the used conjoint analysis, which includes some rankings or ratings of the investment opportunities.

Hensher et al. (2010) extensively discuss several problems with this approach, which at best only provides information on preferences. However, in many real market situations such as in the case of investments, decision makers have to make specific choices, for example, between sustainable and unsustainable investments. Therefore, Hensher et al. (2010) or also Louviere et al. (2010)

highly recommend the use of stated choice (SC) experiments, which refer to decision contexts where choices are made on the basis of hypothetical situations that are described by different levels of the same attributes that can be observed in actual markets or not. While, to the best of our knowledge, no previous study has used this approach for the analysis of WTP for SRI, it is widespread in other economic sub-disciplines such as in transport economics to examine, for example, the WTP for improvements in the driving environment in the choice among road types for specific trips (e.g., Hensher and Sullivan, 2003) or the WTP for fuel availability in the choice among vehicles (e.g., Achtnicht et al., 2012), in energy economics to examine, for example, the WTP for service attributes (e.g., Goett et al., 2000) or the WTP for renewable and nuclear energy (e.g., Murakami et al., 2015) in the choice among energy suppliers or tariffs, or in environmental economics to examine, for example, the WTP for reducing the risks of microbial and cancer illnesses and deaths in the choice among public drinking water programs (e.g., Adamowicz et al., 2011).

This paper analyzes two SC experiments with an (online) representative sample of financial decision makers in German households. One experiment referred to the choice among mutual funds and especially comprised sustainability criteria and past returns as main attributes. However, due to the problems of estimating WTP on the basis of past returns as discussed above, this paper focuses on a second experiment that referred to the choice among three-year fixed-interest rate investment products and comprised yearly interest rates between 1.30% and 2.10% besides sustainability criteria as main attributes. Our econometric analysis with flexible mixed logit models implies strong stated preferences for sustainable mutual funds and sustainable fixed interest investment products. The corresponding estimated average willingness to sacrifice yearly interest rates in sustainable fixed-interest investment products is considerable and amounts to 0.21 percentage points. While it can be argued that this value is overestimated due to the hypothetical character of the SC experiment, it should be noted that we have included techniques to mitigate possible hypothetical biases and that our estimation results remain very stable in several robustness checks.

Our study contributes to the literature in several lines. It especially contributes to the literature on financial and non-financial motives for SRI. As discussed above, compared with previous studies, the application of SC experiments for fixed-interest rate investment products allows us to directly

and more reliably estimate the WTP for sustainable investments. Furthermore, in contrast to most previous empirical studies, the representativeness of our sample allows a drastically higher generalizability and thus external validity of our estimation results. However, our SC experiments do not only consider general sustainability criteria and past returns or fixed-interest rates, but also examine the relevance of sustainability certificates and additionally transparency logos for investment products (e.g., Gutsche and Zwergel, 2016). Therefore, our empirical analysis is able to provide an even broader picture on the preferences for several variants of SRI on the financial markets. Our mixed logit model analysis reveals that the estimated average willingness to sacrifice interest rates in fixed-interest investment products with a transparency label is slightly higher than in fixed-interest investment products that consider sustainability criteria. In particular, the estimated average willingness to sacrifice interest rates for certified sustainable fixed-interest investment products is more than twice as high as the estimated average willingness to sacrifice interest rates for uncertified sustainable fixed-interest investment products.

Another main contribution of our study refers to the literature on social values and norms in the individual investment behavior. The combination of our SC data with variables for social values and norms allows us to estimate the WTP for SRI for different investor groups and thus to complement and even expand previous studies which econometrically examine the effects of social values and norms on sustainable investments (e.g., Nilsson, 2008; Bauer and Smeets, 2015; Gutsche et al., 2016; Riedl and Smeets, 2016; Wins and Zwergel, 2016). Our analysis is mainly based on the application of latent class logit models (e.g., Hensher and Greene, 2003). In such discrete choice models the investors are probabilistically assigned to different classes, whereby the membership to a class depends on several psychological motives, values, and norms besides other individual characteristics. As a consequence, the WTP for sustainable investments can be estimated for different investor classes. Our econometric analysis implies a nearly ten time higher estimated average willingness to sacrifice yearly interest rates in three-year fixed-interest investment products for investor groups with specific social values and norms, i.e. for investors with high feelings of warm glow (e.g., Andreoni, 1990) from SRI, strong considerations of norms by the social environment with respect to SRI, strong environmental values, and an affinity to left-wing parties.

The remainder of the paper is structured as follows: Section 3.2 describes the data from the survey including the two SC experiments. Section 3.3 discusses the estimation results on the basis of our mixed and latent class logit analyses. Finally, section 3.4 concludes.

3.2 Data and variables

3.2.1 Stated choice experiments

Our empirical analysis is based on data from a computer-based survey that was carried out in cooperation with the German market research institute GfK SE, which drew a sample from its internal representative online panel (with respect to age, gender, and place of origin) during December 2013 and January 2014. The population of the survey are financial decision makers in Germany, which are defined as persons who are at least 18 years old and mainly or equally responsible for financial decisions in the households. To ensure that the respondents have a minimum of investment experiences, we further required the interviewees to have at least a savings account. Overall, 1173 respondents participated in the survey. Using a quality saving system that was provided by GfK SE, 172 respondents were excluded from the original sample due to qualitatively insufficient response behavior (e.g., in terms of duration of their responses). Therefore, 1001 respondents are the basis of our empirical analysis. The survey comprised several parts. One part referred to general investment decisions, specifically to SRI, to other pro-environmental and pro-social attitudes and behaviors, to several values and norms, as well as to socio-demographic and socio-economic variables. The main part referred to two SC experiments which comprised choices among several investment products.

The first SC experiment referred to fixed-interest rate investment products. It started with a detailed description of the choice situation. The 1001 participants were asked to choose among four alternative fixed-interest investment products with an investment horizon of three years. The experiment was based on six choice sets. The respondents were informed that some of the displayed investment products are currently not provided by banks, but they were asked to imagine that these products can in fact be purchased. The four investment product alternatives were described by four attributes, respectively:[16]

[16] The respondents were asked to assume that all investment product alternatives are completely identical besides these four attributes (e.g., in terms of investment type or deposit guarantees).

- Provider
- Yearly nominal interest rate
- Sustainability criteria
- Transparency logo

The upper part of Table 9 summarizes these attributes and the corresponding attribute levels in the SC experiment. It reveals that five different providers are included, namely municipal savings banks, co-operative banks, direct banks, sustainability banks, and big banks. With respect to yearly nominal interest rate as the only financial performance attribute, five levels between 1.30% and 2.10% are considered. On the basis of these two attributes, it is, for example, possible to estimate the mean WTP for sustainability banks. However, our main interest refers to the WTP for sustainability criteria of the investment products. We consider three levels for this attribute, namely "no consideration of sustainability criteria", "consideration of sustainability criteria without certificate", and "consideration of sustainability criteria with certificate". In line with our description of the experiment, the consideration of sustainability criteria means that the investment products take ecological, social, and/or ethical criteria into account. In addition, a certificate means that the consideration of sustainability criteria was tested and confirmed by an independent organization. Finally, transparency logos are considered as fourth attribute with three levels, namely "no transparency logo", "transparency logo issued by NGO", and "transparency logo issued by the state". According to our description of the experiment, a transparency logo means that the investment products publicly provide detailed information about the investment strategy. Table 10 reports an exemplary choice set for this first SC experiment. In addition, Figure 1 presents the corresponding original screenshot (in German) of this choice set.

The second SC experiment referred to the choice among four different mutual funds. Since a reliable assessment of several mutual funds requires a certain amount of knowledge and experience of this type of investment products, not all respondents were allowed to participate in this experiment. Only participants who indicated that they have already invested in or are sufficiently informed about mutual funds or stocks were included. Thus, only 801 respondents took part in this second SC experiment. It started again with a detailed description of the choice situation and was based on eight choice sets. The participants were again informed that some of the displayed funds are currently not provided on the capital market, but they were asked to

imagine that these funds can in fact be purchased. The four mutual fund alternatives were described by five attributes, respectively:[17]

- Value of the subscription fee
- Net return in the last year
- Average yearly net return in the last five years
- Sustainability criteria
- Transparency logo

The lower part of Table 9 summarizes these attributes and the corresponding attribute levels in the SC experiment. In contrast to the first SC experiment, this experiment thus comprises three attributes of financial performance. While the values of the subscription fee are fixed amounts that vary between 3.00%, 4.00%, and 5.00%, the five values of the net returns in the last year between 4.00% and 8.00% and the five values of the average yearly net return in the last five years between 3.00% and 9.00% are obviously past returns so that it is not clear whether they persist in the future. Therefore, the inclusion of the latter two financial performance variables as basis for the estimation of WTP should be treated with extreme caution, as discussed above. The two remaining non-financial attributes, i.e. sustainability criteria and transparency logo, are completely identical to the first SC experiment and thus comprise the same three levels, respectively. Table 11 reports an exemplary choice set for this second SC experiment.

The exemplary choice sets in Table 10 and Table 11 as well as the screenshot in Figure 1 reveal that both SC experiments are unlabeled as it is common in such empirical studies (e.g., Goett et al., 2000; Adamowicz et al., 2011; Murakami et al., 2015). The consideration of the four attributes in the first SC experiment and the five attributes in the second SC experiment is based on consultations by practitioners on the capital market before the survey so that a high practical relevance of the experiments and thus the empirical results is ensured. Furthermore, the span of the attribute levels for the yearly nominal interest rates in the first experiments and for the three financial performance attributes in the second experiment are based on usual values on the capital market during the time of the survey at the end of 2013. The experimental designs were generated by GfK SE with the Sawtooth Software. In order to keep both the statistical efficiency as well as

[17] Again, the respondents were asked to assume that all equity fund alternatives are completely identical besides these five attributes.

the precision of estimated interaction terms at an acceptable level, a "Balanced Overlap" design approach was applied (e.g., Chrzan, 2000). In total 50 different versions of randomized choice sets were created for each SC experiment and assigned to the respondents.

3.2.2 Variables in the econometric analysis

The dependent variable in the econometric analysis refers to the choice among the four equity funds and among the four three-year fixed interest rate investment products. The explanatory variables are based on the four attributes of the first experiment and the five attributes in the second experiment as discussed above. While the financial performance attributes are treated as continuous variables and thus directly included, the other attributes are discrete so that dummy variables for each level are defined. In the case of our main interesting variable, i.e. sustainability criteria, the dummy variable for the level "no consideration of sustainability criteria" is used as base category. While one model specification includes the remaining two dummy variables "consideration of sustainability criteria without certificate" and "consideration of sustainability criteria with certificate", another specification only includes the dummy variable "consideration of sustainability criteria", which summarizes the previous two dummy variables. Similarly, the dummy variable for the level "no transparency logo" is used as base category. While the one model specification includes the remaining two dummy variables "transparency logo issued by NGO" and "transparency logo issued by the state", the other specification only includes the dummy variable "transparency logo", which summarizes the previous two dummy variables. With respect to the provider in the first SC experiment, the dummy variable "big bank" is used as base category so that the dummy variables "municipal savings bank", "co-operative bank", "direct bank", and "sustainability bank" are included in the econometric analysis.

While the inclusion of these explanatory variables is sufficient to estimate average WTP for sustainable investments, we additionally compare the WTP for different investor groups. We especially focus on the relevance of social values and norms such as warm glow (e.g., Andreoni, 1990), which can be described as a good feeling through the act of giving. Such feelings can lead to psychological benefits and thus higher utility levels from SRI. The dummy variable "warm glow" takes the value one if a respondent agrees rather strongly or very strongly to the statement "it makes me feel good to hold sustainable investments" or to the statement "I feel responsible for

a sustainable development and want to contribute by sustainable investments".[18] Also in line with the results of Bauer and Smeets (2015), we expect that feelings of warm glow lead to higher WTP for SRI. Preferences and the WTP for sustainable investments can also be affected by social norms or social pressure. In order to avoid social sanctions, individuals often adjust their behavior by complying with the norms of the social environment (e.g., Akerlof and Kranton, 2000; Nyborg and Rege, 2003). Therefore, we expect that such social norms lead to higher WTP for SRI. We consider the dummy variable "expectation social environment" that takes the value one if a respondent agrees rather strongly or very strongly to the statement "my social environment (e.g. family, friends, colleagues) expects me to hold sustainable investments".[19]

In addition to these two variables, we examine an indicator for environmental awareness and political identification, respectively. With respect to the former indicator, the dummy variable "membership environmental organization" takes the value one if a respondent is a member of a group or organization that is engaged in the conservation and protection of the environment and nature. Since ecological financial investments as a main component of SRI are one dimension of pro-environmental behavior, we expect that environmental values such as the membership in an environmental organization do not only affect, for example, pro-environmental behavior like the payment of a price premium for electricity to finance a wind turbine or the consumption of less electricity (e.g., Kotchen and Moore, 2008), but also lead to higher WTP for SRI. For the analysis of political orientation, the participants were asked with which political party they are most likely affiliated. In order to examine the relevance of a left-wing political identification, we consider the dummy variable "affinity left-wing parties" that takes the value one if a respondent is mainly affiliated with the Social Democrats (SPD), the Green Party (Bündnis 90 / Die Grünen), or the Left Party (Die Linke).[20] In line with previous studies on the effect of a left-wing identification on pro-environmental behavior like climate protection activities (e.g., Schwirplies and Ziegler, 2016) and especially on SRI or socially controversial investing (e.g., Hong and Kostovetsky,

[18] In the survey the participants were asked how strongly they agree with the two statements on a symmetric scale with five ordered response categories, i.e. "not at all", "rather weakly", "neither weakly nor strongly", "rather strongly", and "totally".

[19] Again, the participants had to choose among the five ordered response categories "not at all", "rather weakly", "neither weakly nor strongly", "rather strongly", and "totally".

[20] The questionnaire comprised four further dominating political parties in Germany during the time of the survey at the end of 2013, besides these three parties and "another party", namely the Christian Democrats (CDU/CSU), the Liberals (FDP), the main right-wing party (AfD), and the Pirate Party (Piratenpartei).

2012; Hood et al., 2014), we expect a higher WTP for SRI in the population group with this orientation.

We also examine five socio-demographic and socio-economic variables. The dummy variable "female" takes the value one if a respondent is a woman, while "age" is the age of a participant in years. The dummy variable "older respondent" takes the value one if a respondent is older than the average age of the sample. The dummy variable "high education" takes the value one if the highest level of education is at least secondary (i.e. high school graduation), and the dummy variable "living together or married" takes the value one for these two marital statuses. Finally, the dummy variable "Western Germany" takes the value one if a respondent lives in the West German federal states. Table 12 reports the number of observations and the mean for all nine indicators for social values and norms as well as socio-demographic and socio-economic variables.

3.3 Econometric analysis

3.3.1 Mixed logit model analysis

3.3.1.1 Econometric approach

The basis of our discrete choice analysis is that a respondent chooses in each choice set of both SC experiments among four mutually exclusive investment products as discussed above. The hypothetical utility of respondent i ($i = 1,\ldots,N$) for alternative j ($j = 1,\ldots,4$) in choice set m ($m = 1,\ldots,M$ with $M = 6$ in the first SC experiment and $M = 8$ in the second SC experiment) is:

$$U_{ijm} = \beta_i' x_{ijm} + \varepsilon_{ijm}$$

The latent variables U_{ijm} thus depend on the vectors $x_{ijm} = (x_{ijm1},\ldots,x_{ijmK})'$ of explanatory variables that are based on the four or five attributes and the corresponding unknown parameter vectors $\beta_i = (\beta_{i1},\ldots,\beta_{iK})'$, where $K = 7$ or $K = 9$ in the first SC experiment and $K = 5$ or $K = 7$ in the second SC experiment.[21] The values of U_{ijm} cannot be observed and depend on the error terms ε_{ijm}, which summarize all unobserved factors. According to the random utility maximization theory (e.g.,

[21] We 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).

McFadden, 1974), participant *i* chooses category *j* in choice set *m* if the utility of alternative *j* is the largest among all alternatives. The corresponding choice probability is (e.g., Rolfe et al., 2000):

$$P_{ijm} = P(U_{ijm} > U_{ij'm};\ \forall j \neq j') = P\left(\beta_i' x_{ijm} + \varepsilon_{ijm} > \beta_i' x_{ij'm} + \varepsilon_{ij'm};\ \forall j \neq j'\right)$$

With $\beta_i = \beta$ ($\forall i$) the assumption of independently and standard (type 1) extreme value distributed error terms ε_{ijm} (e.g., Train, 2009) leads to the common multinomial or in this approach with only alternative-specific attributes to the conditional logit model. This model approach is characterized by the very restrictive independence of irrelevant alternatives (IIA) property, which implies that the choice probabilities between two alternatives are independent of the existence of further alternatives. However, if the IIA assumption is not correct, the parameter estimates are inconsistent.

In fact, this IIA assumption is mostly not adequate (e.g., Hoyos, 2010). Therefore, we consider much more flexible mixed logit models (MLM). While these models still assume independently and standard (type 1) extreme value distributed error terms ε_{ijm}, they are not based on the restrictive IIA assumption, but allow for taste heterogeneity across participants and thus are able to incorporate correlations between the choice alternatives. MLM (i.e. random parameters logit models as specific variants) specifically assume that the parameters β_{ik} ($i = 1,\ldots,N$) of those explanatory variables that do not refer to financial performance are continuously distributed across *i* (e.g., Greene, 2012):

$$\beta_{ik} = \beta_k + \sigma_k u_{ik}$$

The u_{ik} capture the individual specific heterogeneity and are jointly (in our case) normally distributed with mean zero and standard deviation one. Furthermore, σ_k is the standard deviation of the distribution of β_{ik} around β_k. The mean of β_{ik} is thus β_k. In contrast, the parameters of the financial performance variables are specified to be fixed as it is common practice if the estimated parameters are used for WTP estimations (e.g., Goett et al., 2000; Hensher et al., 2005). Conditional on knowing $\beta_i = (\beta_{i1},...,\beta_{iK})$, the probability that respondent *i* chooses category *j* in choice set *m* is:

$$P_{ijm}(\beta_i) = \frac{e^{\beta_i' x_{ijm}}}{\sum_{j'=1}^{4} e^{\beta_i' x_{ij'm}}}$$

If $P_{im}(\beta_i)$ symbolizes the conditional probability that a specific alternative j is chosen by respondent i in choice set m, the joint conditional probability of the observed sequence of choices across all $M = 6$ or $M = 8$ choice sets is:

$$P_i(\beta_i) = \prod_{m=1}^{M} P_{im}(\beta_i)$$

If $\varphi(\beta_i)$ is the joint density function of the normally distributed β_i, the unconditional probability of the observed sequence of choices is the conditional probability integrated over the distribution of β_i:

$$P_i = \int_{\beta_i} P_{im}(\beta_i)\varphi(\beta_i)d\beta_i$$

The log-likelihood function ($\ln L$) is then the sum of the (naturally) logarithmized probabilities across all N participants: $\ln L = \sum_{i=1}^{N} \ln P_i$. However, the problem is that these probabilities are characterized by multiple integrals, which cannot be computed with deterministic numerical integration methods. Therefore, the application of the common maximum likelihood method is not feasible. Instead, the probabilities can be approximated by simulation methods. The inclusion of these simulated probabilities leads to the simulated maximum likelihood estimation (e.g., Revelt and Train, 1998; Train, 2009). The corresponding simulated log-likelihood function is:

$$\ln L^{sim} = \sum_{i=1}^{N} \ln\left[\frac{1}{R}\sum_{r=1}^{R} P_i\left(\beta_i^r\right)\right]$$

Here β_i^r is the simulated r^{th} random draw from the underlying normal distribution and R is the number of replications, i.e. draws. In our mixed logit analysis we use the Stata command 'mixlogit', which is written by Hole (2007) and use $R = 1000$ Halton draws.[22]

This approach leads to an estimation of the mean and standard deviation of the random parameters as well as to the estimation of one fixed financial performance variable parameter (i.e.

[22] All estimations and statistical analyses for this paper were conducted with Stata.

yearly nominal interest rate) for the first SC experiment and of three fixed financial performance variables parameter (i.e. value of the subscription fee, net return in the last year, average yearly net return in the last five years) for the second SC experiment. On this basis, we commonly estimate the mean WTP by dividing the estimated mean of the random parameters by the estimated parameters of the financial performance variables. While the interpretation of the values as estimated WTP is highly problematic for past returns in the second SC experiment as discussed above, we will nevertheless report these estimates, especially for the analysis of the relevance of short-term and long-term past returns. This leads to six mean WTP estimates when the two aggregated dummy variables (i.e. "consideration of sustainability criteria" and "transparency logo") and to 12 mean WTP estimates when the corresponding four disaggregated dummy variables are included. In the case of the first SC experiment, five mean WTP estimates are considered when the two aggregated dummy variables and eight mean WTP estimates when the corresponding four disaggregated dummy variables are included.

3.3.1.2 Basic estimation results

On the basis of choices of 801 respondents, the upper part of Table 13 reports the main results for the SP experiment on equity funds. The second and third column show the estimated means (and standard deviations) of the (random) parameters for the case that we only distinguish between sustainable or conventional funds and funds with or without a transparency label. All estimated standard deviations of the random parameters are highly significantly from zero indicating unobserved heterogeneity among the respondents. We find highly significant effects of the financial performance attributes on the choice among different equity funds. That is, both short- and mid-term financial returns are significantly positively related to the investment decisions, whereas an increasing subscription fee negatively affects investors' choice. Furthermore, we find a highly significantly positive effect of sustainability criteria on the investment decisions. The lower part of Table 13 reveals considerable amounts of estimated average WTP for sustainability criteria for all three financial performance attributes. It becomes obvious that the respondents are generally willing to sacrifice a larger amount of short-term return compared to mid-term return. While respondents are willing to forego a one-year net return of 4.36 percentage points, they would only give up 2.52 percentage points in terms of the average annual five-year return. Thus, the WTP in terms of short-term return is almost twice as high as the willingness to sacrifice mid-term returns. Further, the former amount almost equals the subscription fees-premium

respondents are willing to pay on average for sustainability criteria. The separate analysis of certified and uncertified sustainability criteria (see column four and five in the upper part of Table 13, and column five to seven in the lower part) shows clearly higher estimated average WTP for certified sustainability criteria (estimated WTP in terms of short-term return: 4.78 percentage points; estimated WTP in terms of mid-term return: 2.76 percentage points), which is nearly twice as high than estimated average WTP for sustainable equity funds without certificate (estimated WTP in terms of short-term return: 2.51 percentage points; estimated WTP in terms of mid-term return: 1.45 percentage points).

In addition, the upper part of the table reveals a highly significant positive effect of a transparency label on the choice among different equity funds, irrespective of whether it was provided by the state or an NGO. The lower part of Table 13 shows that the estimated average WTP for transparency labels in general are very similar to the estimated average WTP for sustainability criteria. Further, the estimated average WTP for transparency labels by the state (estimated WTP in terms of short-term return: 3.97 percentage points; estimated WTP in terms of mid-term return: 2.29 percentage points) are slightly higher compared to transparency labels by an NGO (estimated WTP in terms of short-term return: 3.00 percentage points; estimated WTP in terms of mid-term return: 1.73 percentage points).

The upper part of Table 14 reports the SML estimation results in mixed logit models based on choice data from the SC on fixed-interest investment products. We include the choices of all 1001 respondents, which leads to 6006 observations in total. The table has the same structure as Table 13. It reveals that the estimation results for the financial performance attribute, sustainability criteria, and transparency labels are qualitatively very similar in the choice among fixed-interest investment products. Almost all estimated parameters are highly significantly different from zero, i.e. significant at the 1% significance level. Only the estimated parameter for "direct bank" is only significantly different from zero at the 10% significance level. As before, the financial return, here the fixed-interest rate, positively affects the choice of a certain investment product, i.e. participants are more likely to choose an investment with a higher fixed-interest rate. Respondent are also more likely to select a sustainable investment product than a conventional investment. This result applies for both sustainability criteria with and without

certificate. In addition, the respondents have the highest estimated preference for municipal saving banks and co-operative banks, especially compared with big banks.

The lower part of Table 14 shows a considerable estimated average willingness to sacrifice yearly interest rates for sustainable fixed-interest investment products in the amount of 0.21 percentage points. Furthermore, the estimated average willingness to sacrifice interest rates for certified sustainable fixed-interest investment products is more than twice as high as the estimated average willingness to sacrifice interest rates for uncertified sustainable fixed-interest investment products (0.25 percentage points versus 0.11 percentage points). The estimated average willingness to sacrifice interest rates in favor of fixed-interest investment products with a transparency label (0.26 percentage points) is slightly higher than the estimated average WTP for fixed-interest investment products that consider sustainability criteria (0.21 percentage points). Further, the estimated average WTP for transparency labels by the state (0.24 percentage points) is 0.05 percentage points, and thus nearly 25% higher than the estimated average WTP for transparency labels by NGO (0.19 percentage points).

3.3.1.3 Robustness checks

In order to mitigate possible hypothetical bias in SC experiments, which means that people behave inconsistently, differently compared to real decisions, and possibly overstate their true preferences, we include a certainty question after every choice set (e.g., Hensher et al., 2010). Fifer et al. (2014) find that there is strong relation between hypothetical bias and respondents' uncertainty. Thus, we formulated the question "Please, indicate the degree of certainty that you would choose the selected investment in real investment situation ", followed by a five-point scale ranging from "very uncertain" to "very certain". Further, we implemented a comprehension question and asked the respondents after the SC experiments whether everything was comprehensible. On the basis of the corresponding answers, we conduct several robustness checks, which are reported in Table 15 and Table 16. Each table comprises the results for three different robustness checks. Table 15 refers to the second and third column in Table 14, i.e. to the case which does not distinguish between sustainable investment products with or without certificate and transparency labels by the state or an NGO. Consequently, Table 16 refers to the fourth and fifth column in Table 14.

Both tables have the same structure: The SML estimates reported in columns two and three in the upper parts of the tables (and the second columns in the lower parts of both tables) are based on a sub-sample that only considers choices of 837 respondents who all confirmed that they found the SP experiment(s) comprehensible. Columns four and five in the upper parts of both tables (and the third columns in the lower parts of the tables) contain SML estimates based solely on choices after which the respondents stated that they also would make such an investment in reality. Finally, the last two columns in the upper part of Table 15 and Table 16 (as well as the last columns in the lower part of both tables) comprise the smallest sub-sample as we combine both restrictions here. That means, that we only include choices of persons who found the SC experiment(s) comprehensible and stated that they are "rather sure" or "very sure" that they would make such an investment in reality. The estimates show very similar results across all sub-samples and both model specifications. The basic results in Table 14 are even rather conservative as the estimated average WTP tend to be higher for the smaller subsamples, particularly when we only consider those decisions in which the persons stated that they are sure to make these investments in reality. In summary, the basic estimation results are confirmed by all robust checks.

3.3.1.4 Who is willing to pay for sustainable investments?

So far, the analysis reveals positive preferences for sustainability criteria and transparency labels on average. However, it is yet unclear whether the estimated average WTP vary across different socio-demographic groups or are influenced by different social norms or values. Consequently, Table 17 reports the estimated average WTP for sustainable fixed-interest investment products in general (column two), sustainable fixed-interest investment products without certificate (column three), and sustainable fixed-interest investment products with certificate (column four) for various sub-samples. The results reveal that there are no large differences in estimated average WTP across different socio-demographic groups. However, the results suggest that women, younger respondents, persons with a lower educational degree, and those living in Eastern Germany tend to have slightly higher WTP than their counterparts.

More importantly, Table 17 also shows higher estimated average willingness to sacrifice yearly interest rates in three-year fixed-interest investment products for investor groups with specific social values and norms, i.e. for investors with high feelings of warm glow from SRI, strong

considerations of norms by the social environment with respect to SRI, strong environmental values, and an affinity to left-wing parties. Particularly, based on the second column we find that estimated average WTP for investors with strong warm glow feelings from SRI is 2.6 times higher compared to the reference group. Further, the estimated average WTP for respondents stating that the social environment expects them to invest in SRI, members of environmental organizations, or adherents of left-wing parties is approximately as twice as high compared to the corresponding counterpart, respectively.

Columns three and four reveal that these results are obviously driven by the WTP for certified sustainability fixed-interest investment products. A comparison of the various estimated average WTP in both columns show that the differences in the willingness to sacrifice return are tremendously lower in case of sustainability investment products which are not certified. Anyway, there still clear differences which can be explained by heterogeneity in social norms and values. However, these results are only based on comparisons between two different investor groups, respectively, and thus cannot capture possible correlations with other variables. Therefore, we analyze the identification of investor groups with higher and lower WTP for SRI on the basis of a much more sophisticated latent class logit model analysis.

3.3.2 Latent class logit model analysis

3.3.2.1 Econometric approach

In addition, we consider latent class logit models (LCLM). In contrast to MLM, which include taste heterogeneity by continuous parameter variation, LCLM assume a discrete mixing distribution (e.g., Hensher and Greene, 2003; Train, 2009). Therefore, it is assumed that participants are sorted into a set of *Q* classes. Apart from that, we again assume that the error terms ε_{ijm} are iid standard type I extreme value. If respondent *i* belongs to class *q* ($q = 1,\ldots,Q$), the probability that *i* chooses category *j* in choice set *m* is:

$$P_{ijmq}\left(\beta_q\right) = \frac{e^{\beta_q' x_{ijm}}}{\sum_{k=1}^{4} e^{\beta_q' x_{ikm}}}$$

Now $\beta_q = (\beta_{q1},\ldots,\beta_{q4})'$ is a class-specific vector of parameters for class *q* with respect to the first SC experiment (analogously, $\beta_q = (\beta_{q1},\ldots,\beta_{q5})'$ in the second SC experiment). If $P_{imq}(\beta_q)$ symbolizes the conditional probability that a specific alternative *j* is chosen by participant *i* in class *q* in choice set *m*, the joint conditional probability of the observed sequence of choices across all six choice sets of the first SC experiment is:[23]

$$P_{iq}(\beta_q) = \prod_{m=1}^{6} P_{imq}(\beta_q)$$

However, the class membership is unknown. The respondents are probabilistically assigned to the *Q* different classes by a class membership model. It is assumed that the membership to a class *q* depends on a vector $z_i = (z_{i1},\ldots,z_{il})$' of individual characteristics and the corresponding unknown parameter vector $\theta_q = (\theta_{q1},\ldots,\theta_{ql})$'. By additionally assuming that the error terms in the class membership model are iid standard extreme value I, the probability that participant *i* belongs to class *q* is:

$$H_{iq} = \frac{e^{\theta_q' z_i}}{\sum_{q=1}^{Q} e^{\theta_q' z_i}}$$

With respect to formal model identification, θ_Q is normalized to the zero vector. If no individual characteristics are considered, the only element of z_i is the constant. The unconditional probability of the observed sequence of choices across all six (eight) choice sets is:

$$P_i = \sum_{q=1}^{Q} H_{iq} P_{iq}(\beta_q)$$

Finally, the log-likelihood function is:

[23] With respect to the second SC experiment, the formula is: $P_{iq}(\beta_q) = \prod_{m=1}^{8} P_{imq}(\beta_q)$.

$$\ln L = \sum_{i=1}^{N} \ln P_i = \sum_{i=1}^{N} \ln \left[\sum_{q=1}^{Q} \frac{e^{\theta_q' z_i}}{\sum_{q=1}^{Q} e^{\theta_q' z_i}} \left(\prod_{m=1}^{6} P_{imq}\left(\beta_q\right) \right) \right]$$

The maximization of this log-likelihood function thus refers to the Q structural parameter vectors $\beta_1,\ldots,\beta_Q$ and the Q-1 latent class parameter vectors $\theta_1,\ldots,\theta_{Q-1}$. However, this optimization problem is numerically not trivial compared to other common maximum likelihood estimations (e.g., Hensher and Greene, 2003). In line with Train (2009), we use the Expectation-Maximization algorithm to guarantee numerical stability and convergence of the log-likelihood function to a local maximum even for a higher number of classes. This algorithm has recently been included in a Stata module (Pacifico and Yoo, 2013). Another challenge is the choice of an appropriate number Q of classes, which is commonly based on the use of information criteria such as the Bayesian information criterion or the consistent Akaike information criterion. In our study we analyze LCLM with two and three classes.

3.3.2.2 Estimation results

Table 18 reports the SML parameters estimates in a latent class model with two classes and individual characteristics explaining class membership. The estimated average WTP shown in columns three and five in the upper part of the table are directly derived on the basis of the estimated parameters in columns two and four, respectively. Again, we only calculated the WTP measures if the corresponding parameters were at least significant at the 10% significance level.

For class 1, all estimated parameters for the attributes are highly significantly different from zero, which allows us to derive WTP estimates for all attributes. Members of this class are obviously willing to sacrifice a large part of their return, for example, about 0.50 percentage points, in order to invest in a sustainable product or a product with a transparency label, respectively. This group is also willing to sacrifice around 0.40 percentage points in favor of a product offered from a municipality or co-operative bank compared to a big bank. Contrarily, the second class is, if any, clearly less willing to sacrifice return for non-financial issues. For example, this class is willing to forego only 0.06 percentage points in order to invest in a sustainable investment product and 0.09 percentage points for a product with a transparency label. In case of products from a sustainability bank (compared to big banks), members of this class even demand a return

premium in the amount of 0.05 percentage points. These patterns are clearly supported by the estimates for the individual characteristics reported in the lower part of Table 18. Members of the first class tend to be female, older, have a lower educational qualification, and live in Eastern Germany compared to members of class 2. Additionally, they are particularly members of environmental organizations, left-wing party adherents, receive feelings of warm glow from sustainable investments, and perceive that their social environment expect them to invest in sustainable investments.

Finally, Table 19 reports the SML estimates for a latent class model with three classes. We again uncover a class that seems to consist of persons mainly focusing on financial aspects, namely class 3. The WTP estimates for this class are comparable with those reported for class 2 in Table 18, with the exception that we cannot derive the estimated average WTP for products from co-operative banks as the corresponding parameter is not significantly different from zero. Members of class 1 seem to have high preferences in terms of estimated average WTP for sustainable and transparent investment products. On average, they are willing to sacrifice 0.57 percentage points for sustainable products and 0.49 percentage points for transparency labels. Relative to the third class, members of class 1 are from Eastern Germany, receive feelings of warm glow from sustainable investments, are members of environmental organizations, and tend to be left-wing supporters.

We also reveal positive estimated average WTP among members of the second class for sustainable investment products. However, they are clearly lower compared to the estimates for class 1, namely only 0.24 instead of 0.57 percentage points. This class seems to be more worried about trust and transparency issues, as they have high estimated WTP for transparency labels as well as local banks compared to big banks. They even demand a return premium for investment products from sustainability banks compared to big banks. Members of this class tend to be female, have a lower education, are from Eastern Germany, perceive high expectations from their social environment, and are members of environmental organizations, compared to members of the third class.

3.4 Conclusion

This study examines whether investors are willing to sacrifice return in favor for fixed-interest investment products and equity funds. The empirical analysis is based on questionnaire and experimental data from a broad and (online) representative survey among financial decision makers in German households. This survey structure allows us to combine variables capturing social norms and personal values and (hypothetical) investment decisions of individuals. Thereby, our approach overcomes several drawbacks of previous studies, which either only indirectly examine the WTP or preferences for SRI, use unrepresentative samples, or very simple and/or inappropriate methods to derive reliable WTP estimates for SRI. One main advantage of this study is that it includes SC experiments on fixed-interest investment products, which are mostly neglected in previous studies. More importantly, the inclusion of these kinds of investment products allows us to derive WTP estimates which are not based on past returns.

Our econometric approach comprises the analyses of highly flexible mixed logit as well as latent class models, which allow to control for heterogeneity across individuals' preferences and to identify whether WTP varies across different investor groups. The main analysis shows that individuals have strong preferences for sustainable equity funds and sustainable fixed-interest investment products. The corresponding estimated average willingness to sacrifice yearly interest rates in sustainable fixed-interest investment products is considerable and amounts to 0.21 percentage points. Several robustness checks confirm these core results. In addition, another interesting result is that the respondents strongly prefer fixed-interest investment products offered by municipal savings and co-operative banks compared with big banks and also compared with sustainability banks in spite of the high stated preferences for sustainability criteria. The results of SC experiment on equity funds reveal that private investors tend to prefer sacrificing short-term returns instead of mid-term returns. Thus, our results are qualitatively rather similar to the findings of previous studies, which are however not directly comparable due to different (unrepresentative) samples or identification techniques.

Additionally, we contribute to the literature on social norms and personal values. The in-depth analysis underpins previous studies on motives for SRI (e.g., Bauer and Smeets, 2015; Gutsche et al., 2016; Riedl and Smeets, 2016), but also on the importance of non-financial criteria in investment decisions and pro-social or pro-environmental activities in general as we find that

financial decision makers who receive warm glow feelings from SRI, are members of environmental organizations, perceive that society expects them to invest in SRI, or prefer left-wing parties have significantly higher WTP for sustainable investment products.

In particular, the results are interesting in the context of current developments in the European SRI market as the FNG, the roof organization for sustainable investments in Germany, and the French SRI research company Novethic recently launched a new label for SRI funds in corporation with in Germany. However, to the best of our knowledge our paper and the complementary study by Gutsche and Zwergel (2016) are the only academic studies examining the (potential) effects of such labels on the investment behavior of investors. Hence, we provide additional empirical evidence that private investors have positive preferences for these kinds of labels.

4. Information barriers and individual participation in the sustainable and responsible investment market – Can sustainability and transparency labels help?

Authors: Gunnar Gutsche, Bernhard Zwergel

Abstract: This study empirically analyzes barriers preventing private investors from participating in the market of sustainable and responsible investment (SRI) by linking the participation costs framework to SRI market participation. The empirical analysis is based on an online representative survey of financial decision makers also containing a stated preferences discrete choice experiment. Contrary to previous studies, we differentiate between four different investor groups and find that they face different barriers regarding SRI market participation. Particularly too high (perceived) information costs regarding SRI prevent investors from investing (more) in SRI. Receiving no offer by their bank is a big market entry hurdle especially for interested investors. Distrusting providers of SRI is a main issue discouraging skeptical and conventional investors. The experiment reveals that investors of all groups have positive preferences for funds with transparency or sustainability labels. Hence, labels are an opportunity to decrease information costs thereby enhancing individual demand for SRI.

Keywords: Sustainable and responsible investment; microeconometric analysis; discrete choice experiment; labelling schemes; transparency; market participation

JEL: C25, G11, M14, Q56

4.1 Introduction

During the last years, sustainable and responsible investment (SRI), i.e. investment products combining financial, environmental, social, and governance (ESG) issues, has become increasingly recognized in financial research and practice. According to the roof organization for sustainable investments in Germany the Forum Nachhaltige Geldanlagen (FNG), today almost every conventional investment product has its socially responsible counterpart (FNG, 2016). This gives private investors the opportunity to consider financial as well as non-financial aspects according to their individual preferences with respect to ecological, social, and/or ethical issues in their investment decisions. Current figures suggest that these investment opportunities are very well accepted by investors: Across Europe the SRI market grew strongly by 22.6% (measured in total investment volume) in the time period from 2011 to 2013 (Eurosif, 2014). However, it also should be noted that this development is mainly driven by institutional investors, since the retail investors' share in total SRI volume in Europe even decreased from 8.0% in 2009 to 3.4% in 2013 (Eurosif, 2014). In Germany the share of retail investors also decreased from 25% to 17% between 2013 and 2014, but is still larger than the European average (FNG, 2015b). This development gives reason to raise the question whether these investment products may not only be an opportunity but also a challenge, particularly for private investors. Investors are confronted with a large variety of investment products employing many different sustainable investment strategies. The FNG (2015b), for example, distinguishes between eight different sustainable investment strategies. Sandberg et al. (2009) point out that there is even a broad discussion on how to define and entitle investment strategies including ESG issues.

Indeed, Nilsson et al. (2012) argue that, particularly less sophisticated, private investors are overwhelmed by information or the complexity of (socially responsible) financial products. In the context of conventional investment products, previous studies find that private investors can be prone to a vast variety of factors that prevent them from stock market participation (see e.g., van Rooij et al. (2011) on financial literacy; Kaustia and Torstila (2011) on political ideology; Guiso et al. (2008) on (dis-) trust and on socio-demographics). In case of SRI, empirical studies argue or empirically find that distrust in SRI providers (e.g., Nilsson, 2008; Wins and Zwergel, 2016), the perception of financial performance of SRI compared to conventional products (e.g., Bauer and Smeets, 2015; Eurosif, 2012b; Nilsson, 2008; Riedl and Smeets, 2014; Paetzold and Busch, 2014; Wins and Zwergel, 2015), information related issues, such as information asymmetries (Rhodes,

2010), too much or complex information (Nilsson et al., 2012), too less information (Hummels and Timmer, 2004), search costs (Benson and Humphrey, 2008), but also poor knowledge or low financial literacy (e.g., Riedl and Smeets, 2014; Nilsson et al., 2012; Borgers and Pownall, 2014) as well as a bad performance of advisors (Schrader, 2006) might be crucial barriers that hinder private investors from investing in SRI or to invest more, i.e. to participate in the SRI market. Similar problems are (well-) known in consumption research and can lead to the attitude-behavior gap (e.g., Young et al., 2010), which seems also to be a problem related to SRI (e.g., Nilsson, 2008; Wins and Zwergel, 2016).

In this context, we follow Vissing-Jorgensen's (2004) view that participation costs consist of information and transaction costs. This leads to our main hypothesis that limited SRI market participation is a result of too high participation costs related to sustainable financial products. Since transaction costs to participate in the SRI market can be expected to be similar than for the stock market, particularly information costs, for example due to information asymmetries (Rhodes, 2010) or the higher level of complexity, can be an important hurdle for investors preventing them from investing in SRI. It is virtually impossible for a private investor to assess whether or not the stocks included in the fund portfolio really are sustainable (e.g., Entine, 2003, Nilsson et al., 2012). Market failures arising from asymmetric information or high search costs are often addressed by increased information disclosure (e.g., Campbell et al., 2011). This can either be supported by means of regulatory measures or introducing (voluntary) third-party eco-labeling schemes that can be sponsored by the government itself or NGOs (Cason and Gangadharan, 2002).

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 sustainable mutual funds and also to increase the transparency of socially responsible mutual funds. In the context of SRI funds a sustainability label imposes quality requirements with respect to the funds sustainability attributes, whereas a transparency label only seeks to "enable stakeholders, in particular retail investors, to understand the policies and practices of a given SRI fund" (Eurosif, 2014). In Europe the existence of transparency logos by Eurosif, the Austrian Ecolabel, the French Novethic SRI Label, the French Novethic Green Fund Label, or the new

German sustainability label published by the FNG show how relevant this topic is (FNG, 2015a). Besides the questions of how to construct such labels, it is an empirical question whether and how private investors consider them in their investment decisions.

Against this background, the purpose of this paper is twofold. First, it empirically analyzes which barriers prevent private investors from investing in SRI and second, whether sustainability and/or transparency labels, as means of information disclosure, can help to overcome at least some of these barriers. In order to empirically examine these questions, this study uses a unique dataset from a representative survey among financial decision makers in German households. For answering the first research question, the questionnaire contains questions about potential barriers that might prevent private investors from investing in SRI, such as the respondents' perception of distrust, their level of information, and their investment knowledge with respect to SRI, but also information on sociodemographic and –economic variables as well as whether the investors are currently invested in SRI or plan to invest in SRI. This allows us to compare different investor groups, namely sustainable and responsible (SR), skeptical (SK), interested (INT), and conventional (CONV) investors and empirically analyze whether they face different barriers. Although several empirical studies examine which factors might prevent individual investors from stock market participation in general (e.g., van Rooij et al., 2011; Guiso et al., 2008), only a very few studies examine why people do not invest in SRI (e.g., Wins and Zwergel, 2016; Paetzold and Busch, 2014). Hence, our empirical analysis on the basis of a unique and broad dataset extends the existing literature about individual investment decisions regarding SRI, because it considers heterogeneity across investors as well as investment barriers, i.e. an aspect that is mainly neglected in previous studies.

A stated preferences discrete choice experiment (DCE) was included for answering the second research question. It comprises eight successive hypothetical investment situations for each respondent in which they had to select one out of four equity funds. The funds differ from each other with respect to financial attributes as well as non-financial attributes, like sustainability certificates, and transparency logos. Thereby, we contribute to the literature about (eco-) labels. This is interesting for at least three reasons. First, as far as we know no previous study investigates whether labels are taken into account by private investors related to SRI. Second, several (theoretical) papers argue that labels can overcome asymmetric information problems or

mistrust, or decrease search costs, previous empirical studies usually focus on examining whether consumers are willing to pay a price premium for labeled products (see e.g., Loureiro and Lotade, 2005) and if different groups can be identified according to socio-demographic variables, or how to create an efficient labeling scheme (e.g., Ibanez and Grolleau, 2008; Heinzle and Wüstenhagen, 2012). However, to the best of our knowledge there is no study at all trying to identify whether consumer or investor groups with, for example, lower knowledge levels or higher levels of distrust towards a product react differently towards labels. Finally, we examine two types of labels that focus on different aspects, namely sustainability and transparency. Hence, our results can help policy makers as well as third-party certification authorities when creating label schemes in the field of SRI.

Our empirical analysis shows that it is important to account for investor heterogeneity by distinguishing between (several) different investors groups in the context of SRI instead of only distinguishing between two investor groups (investors who are currently invested in SRI and those who are not) as most studies do (e.g., Junkus and Berry, 2010, McLachlan and Gardner, 2004). The four different groups we consider face different barriers in their investment decision processes in the context of SRI. A lack of knowledge of SRI and the perception of feeling poorly informed about SRI, i.e. (perceived) high information costs, are important issues why private investors in general do not invest (more) in SRI. Particularly having not received an offer by their bank yet is a big hurdle for INT investors. Distrusting providers of SRI is an additional issue that especially hinders SK and CONV investors to invest (more) in SRI and seems to be an important factor for discriminating future potential investors (SR and INT) and those who are not planning to invest in SRI in the future (SK and CONV). Further, we find that sustainability and/or transparency labels could present a measure to decrease information costs in context of SRI as all kinds of investors positively react to these labels. However, SR and INT investors have significantly higher stated preferences for both kinds of labels than SK or CONV investors. Hence, labels could be particularly useful to guide INT investors who tend to feel poorly informed about SRI.

The remainder of this paper is structured as follows. The next section reviews the literature on (potential) barriers for private investors that might prevent them from participating in the SRI market. Further, we review how labels might help to overcome certain market failures which

might arise due to the aforementioned barriers and give an overview of existing labels regarding SRI. We also derive hypotheses to be tested in the empirical analysis. Section 4.3 describes the survey, the experimental approach, related data and variables, and the microeconometric methodologies that we use to analyze the data. The empirical results are presented and interpreted in section 4.4, and section 4.5 concludes.

4.2 Literature review and hypotheses

4.2.1 Potential barriers for private investors

According to the idea of participation costs, individuals only join a market or actively shift their portfolio, i.e. invest in a certain financial product, if their costs for participation do not exceed a given threshold (e.g., Guiso et al., 2008). Vissing-Jorgensen (2004) describes these costs as information and transaction costs that occur in form of initial or entry costs, which are faced by new investors, and recurring periodical costs that have to be borne by all participants of the market (see also Haliassos and Bertaut, 1995; Favilukis, 2013). This concept is often used for explaining limited stock market participation or inertia (e.g., Haliassos and Bertaut, 1995; Vissing-Jorgensen, 2004; Guiso et al., 2008; Bonaparte and Kumar, 2013) and we apply it to the case of investment decision related to SRI. Information costs are naturally higher in case of new and/or more complex financial products, such as SRI, and thus should play an important role regarding individuals' SRI market participation.

Following Vissing-Jorgensen (2004) information costs arise as investors need to search and understand information on an asset (class), the related market, the whole economy, etc. to feel comfortable enough to invest in a certain asset and/or to make good investment decisions, i.e. avoid investment mistakes (see also Campbell, 2006; Graham et al., 2009; García, 2013). Costs for these processes are often interpreted as lump sum costs, fixed entry costs, or opportunity costs valuing the time spent by investors (e.g., Haliassos and Bertaut, 1995; Vissing-Jorgensen, 2004, Allen and Santomero, 2001). Costs could also be directly understood as an individual's psychological state that makes them not feel sufficiently comfortable to invest in a product (Campbell, 2006). 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., Vissing-Jorgensen, 2004, Haliassos and

Bertaut, 1995). Both types of costs can exist in terms of initial one-time or entry costs faced by new investors, for example time spent for searching, learning, and understanding initial information about a certain financial 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). For simplification, we assume information costs to be measured in (perceived) time spent for gathering and processing information on SRI. On this basis, we generally hypothesize (perceived) information costs have a negative effect on SRI market participation. To sum up, we formulate our first and main hypothesis:

H1a: Private investors who are (or feel) poorly informed on (sustainable) financial products are less likely to attend the SRI market.

Starting from this broad hypothesis, we try to disentangle the determinants regarding information and transaction costs related to SRI, and hence to identify related (information) barriers preventing private investors from SRI market participation.

Previous studies on barriers of stock market participation find that little (economical or financial) knowledge (for example, measured as self-assessed knowledge or financial literacy scores) and education[24] are important determinants of individual investment behavior. For example, less sophisticated private investors make severe mistakes in financial decisions, i.e. decisions inconsistent to financial theory, and are less likely invested in stocks (e.g., Campbell, 2006; Calvet et al., 2009; García, 2013; van Rooij et al., 2011). Financial knowledge and education also affect other areas of financial decision making or economic behavior or lead to normative controversial investment behavior, such as underdiversification of portfolios or worse financial performance (see e.g., Guiso and Jappelli, 2008; von Gaudecker, 2015). In context of financial innovations Campbell (2006) states that retail markets are often inert and it takes time until private investors, particularly financially less sophisticated ones, adopt and accept new financial products. These results can be linked to the participation costs framework by assuming that investors with a lack of knowledge face higher information costs, in terms of money spent but also time, which they have to spent for gathering and understanding information.

[24] And also related issues, such as cognitive abilities and IQ (e.g., Grinblatt et al. (2011)).

In context of investment decisions related to SRI, Bauer and Smeets (2015) and Borgers and Pownall (2014) examine the effect of financial literacy or self-assessed financial knowledge on SRI investment behavior. Borgers and Pownall (2014) conduct a survey among private investors from the Netherlands. Their empirical results show that financially literate people are less likely to make inconsistent decisions and argue that investors with low financial literacy scores are not able to consider financial and non-financial attitudes at the same time. Bauer and Smeets (2015) analyze the behavior of customers from two Dutch banks which are specialized on SRI. They use self-rated investment knowledge as one of their control variables. They find no significant effect of self-rated financial knowledge on the portfolio share (in percent) nor the amount invested at the SR bank. However, they find a significant positive effect on the number of conventional investment accounts or number of savings accounts. Since empirical results are limited, it is still an empirical question whether (self-assessed financial) knowledge of SRI has an impact on being invested in SRI. According to the aforementioned reasons and most empirical studies regarding stock market participation, we state the following hypothesis:

H1b: Private investors with only little knowledge of SRI are less likely to invest in SRI.

Closely related to this issue, we also examine whether education has an impact on the probability of being invested in SRI. Previous studies on stock market participation argue that education has a positive effect on being invested in stocks as more highly educated people face lower information costs compared to people with a lower education (e.g., Campbell, 2006). Further, it is important to distinguish between knowledge of SRI and education, as education turned out to be a bad proxy for financial literacy (van Rooij et al., 2011). In line with this rationale, several empirical studies show that education positively affects the propensity of stockholding, as, for example, shown in Christelis et al. (2010), Georgarakos and Pasini (2011), Guiso et al. (2008), van Rooij et al. (2011), Campbell (2006). In context of SRI, Bauer and Smeets (2015) find that investors with a university degree invest (weakly) 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 SRI funds. Borgers and Pownall (2014) find that more highly educated investors are more likely to pay for socially screened investment portfolios. 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 their respondents and

in turn their involvement in SR investing. In sum and in line with previous studies we state the following hypothesis:

H1c: Private investors with low levels of education are less likely to invest in SRI.

Another important (potential) barrier related to information costs is mentioned by Allen and Santomero (2001) who argue that participation costs can be lowered by intermediaries, such as banks. They state that the size of participation costs refers not only to the time spent for making financial decisions but particularly to issues related to acquiring and processing information. In their view, intermediaries play an important role as they can lower participation costs and information barriers by helping to solve complex problems investors might have, especially in areas where asymmetric information problems might be present. Finally, they argue that if intermediaries do not help to lower participation costs this might "prevent investors from reaping the benefits of new markets, and the markets themselves might not survive". Although they do not directly refer to SRI markets, we adopt their argumentation to the case of SRI market participation. This makes sense as Schrader (2006) and also Paetzold and Busch (2014) already argue that banks perform badly when it comes to advisements or providing information on SRI products. We assume that a lack of intermediation and advisements by banks prevents investors from SRI market participation as the investors' information costs (and thus also participation costs) are too high. This argumentation leads us to stating the following hypothesis:

H1d: Investors stating that banks did not offer them any sustainable investments are less likely to attend the SRI market.

Another important factor naturally influencing individual decision making with respect to credence goods, but also economic behavior or financial transactions in general, and thus a potential determinant of SRI investment behavior, is trust (e.g., Taufique et al., 2014; Christelis et al., 2010; Nilsson, 2008). As mentioned above, consumers or investors cannot directly assess whether the information, for example the degree of sustainability of a financial product, published by sellers or providers is true. Thus, in case that no further external information are available, they can only rely on information published by the sellers or providers and hence have to trust them. As a consequence, distrust can lead consumers to rejecting these products (Campbell et al., 2011).

More generally, empirical evidence, as reported in Biehl et al. (2012), shows that trust is positively related to many economic activities, such as the performance of large organizations, stock market capitalization, or household decisions (e.g., La Porta et al., 1996; Calderon et al., 2002; Guiso et al., 2008). In context of financial decisions, previous empirical studies show that (dis-) trust affects stock market participation (Guiso et al., 2008; Georgarakos and Pasini, 2011) and investment decisions related to risky assets (Georgarakos and Pasini, 2011).

Guiso et al. (2008) examine the effect of trust on stock market participation across individual investors. They distinguish between individuals' general trusting attitudes towards other people and individuals' trust in institutions, i.e. in banks or brokers. They find that trusting investors are more likely to invest in stocks, and further that if they are invested, they buy more stocks than their counterparts. Nilsson (2008) examines the influence on individual trust related to SRI. For identifying the effects of trust on the share of the investors' total portfolio invested in SRI he drew a sample of Swedish fund investors. Hypothesizing that trust in pro-social claims has a positive influence on investment decisions in favor of SRI compared to conventional investments, the estimation results show only a weak significant positive effect of trust (p-value = 0.08). Thus trusting investors are more likely to invest a larger share of their portfolio in SRI. Wins and Zwergel (2016) also examine the influence on individual trust related to SRI. They conclude that trust has a positive effect on individual investment behavior regarding SR funds. Hence, based on the aforementioned empirical findings we expect distrust to constitute an important barrier for investors:

H2: Distrusting private investors are less likely to invest in SRI.

One important and often examined question in the field of SRI is whether SR investment products perform equally or differently (better or worse) compared to their conventional counterparts. Dorfleitner and Utz (2014) report that less financial return conscious investors invest larger amounts of their portfolio in SRI. This is in line with other studies, which empirically find that SR investors are willing to sacrifice return when investing in SRI funds (e.g., Wins and Zwergel, 2016; Lewis and Mackenzie, 2000). Therefore, the (expected) relative performance of SRI compared to conventional investments could be an important barrier for investor groups especially those that are currently not invested in SRI.

Several studies (e.g., Bauer et al., 2005) and reviews (e.g., von Wallis and Klein, 2015, Kiymaz, 2012) as well as meta analyses (e.g. Friede et al., 2015, Rathner, 2013) on empirical studies on relative SRI performance summarize that in most cases sustainable funds perform better or equal to conventional funds. These reviews list several potential reasons that can influence the results of performance analyses. Differences can be explained by different sample periods, sample size, data sources, etc. (e.g., Chegut et al., 2011, Rathner, 2013, von Wallis and Klein, 2015). Because research cannot fully resolve the question whether or not SRI and conventional investments perform differently, this could be an important barrier for private investors.

Nilsson (2008) argues that individual investors are not guided by the objective but perceived performance of investment products, and that even investors who do not care about social responsibility might invest in SRI due to financial reasons. The former issue is supported by findings made by De Bondt (1998) revealing that individuals' perception, for example with respect to variability of stock returns, often differ from what objective measures tell. Thus, Nilsson (2008) finds that investors are significantly more likely to invest a larger share of their portfolio in SRI, when expecting the same or above average returns. However, perception of risk has no significant influence. Riedl and Smeets (2014) analyze administrative data of individual investors of one large mutual fund provider in the Netherlands. They consider the investment behavior of both conventional and SR investors over a period from 2002 to 2012 and find no significant effects of expectation on return nor risk perception on the probability to invest in SRI funds. Bauer and Smeets (2015) investigate the role of social identification by using data from an online survey among 3187 private investors of two specialized, socially responsible banks in the Netherlands. In their sample, SR investors perceive the risk of SRI funds to be higher compared to conventional funds, while approximately 45% expect the return of SRI to be higher. For example, they find that investors expecting lower returns invest significantly less at the specialized, socially responsible banks. According to Wins and Zwergel (2015) the percentage of ethical investors (from the US, the UK, Sweden, and Germany) who believe that ethical funds have a lower return than conventional funds is always higher than the percentage of those who think that ethical funds offer a higher return than conventional funds. Regarding risk Wins and Zwergel (2015) conclude that most ethical investors (from the UK, Sweden, and Germany) share the opinion that SR funds' risk is similar to or less than that of conventional funds. With respect to high net worth individuals (HNWIs) Paetzold and Busch (2014) find in their qualitative

analysis of ten individuals that those who perceive SRI as highly volatile were less likely to engage in SRI. This is supported by findings of Eurosif (2012a) revealing that performance concerns is the main barrier of HNWIs. Thus, in line with the previous findings we formulate the following hypotheses:

H3a: Individual investors are less likely to invest in SRI if they expect lower returns for SRI compared to conventional investments.

H3b: Individual investors are less likely to invest in SRI if they perceive SRI to be riskier than conventional investments.

Finally, Vissing-Jorgensen (2004) argues that transaction costs are a potential barrier for stock market participation. However, to the best of our knowledge, no previous study included the individuals' perception of fees regarding SRI compared to conventional investments. There are only surveys that ask SR investors whether or not fees are important in the investment decision (e.g., Wins and Zwergel, 2016 and Pérez-Gladish et al., 2012), but there are no surveys that have asked respondents about their perception of fees of SR funds compared to conventional funds. Since one could argue that intensive screening processes lead to higher costs, investors might expect that they have to pay higher fees for SRI. Thus, in context of financial barriers we finally hypothesize:

H3c: Individual investors perceiving fees for SRI to be higher compared to fees of conventional investments are less likely to invest in SRI.

4.2.2 Labeling schemes as measures to decrease information costs

A potential measure to decrease information and search costs are (eco-) labeling schemes as they make information visible to consumers, and thus can simplify purchase decisions (see e.g., Teisl et al., 2002, Cason and Gangadharan, 2002). Furthermore, (eco-) labels can be part of a firm's marketing strategy aimed at capturing a premium that consumers are willing to pay, increasing market shares, and increasing the reputation of the firm (see e.g., Cason and Gangadharan, 2002, Brécard et al., 2009, Loureiro and Lotade, 2005). Finally, politics might use (eco-) labels in order to change market behavior building on the argument of Sandberg et al. (2009) that standardization may facilitate the mainstreaming of SRI. On the one hand, they can increase consumers' awareness about product- and/or production-related environmental issues and thus

inform and educate them about (potential) impacts of products on the environment (see e.g., Brécard et al., 2009, Teisl et al., 2002). On the other hand, they might drive firms towards environmentally friendlier production techniques, and thus increase environmental quality (e.g., Bleda and Valente, 2009, Amacher et al., 2004, Ibanez and Grolleau, 2008, Brécard et al., 2009).

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 sustainable investment labels to help retail investors in their search for a personally suitable 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 'sustainable' it only seeks to "enable stakeholders, in particular retail investors, to understand the policies and practices of a given SRI fund" (Eurosif, 2014). Until December 2013 more than half of the approximately 900 SRI funds in Europe have already committed themselves to this code (Eurosif, 2014). 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 SRI 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. (see Kornherr, 2012 for details). Likewise, the Novethic SRI Label and the Novethic Green Fund Label are also designed as quality standards (Novethic, 2015). Apart from these bigger labels, there are labels from Luxflag, Forum Ethibel and the Responsible Investment Association Australasia.[25] In addition, the FNG in corporation with France based Novethic, launched a new label for SRI funds in Germany in November 2015.

Because there are no surveys or experiments regarding labels in the SRI market we primarily ground our hypotheses in the literature on eco- and fair trade labels. These two kinds of labels are especially suited to be connected to the SRI context since they often consider social, ecological and ethical aspects in their labeling schemes. In the SRI literature, these three characteristics are often referred to as SEE issues. According to Nilsson (2008) the "trend that has influenced the growth of the SRI industry is that the recent years have been marked by an increase in consumer

[25] For details see Zwergel (2016).

concern for social, ethical, and environmental (SEE) issues." This is in line with Owen and Qian (2008) who report that "people who purchase environmentally friendly products as a consumer also seem to carry over their societal concerns to investment decisions".

Despite this positive trend consumer skepticism and confusion about social and environmental assertions of products have become a serious problem (e.g. Crane, 2000, Chen and Chang, 2013). According to Caswell and Padberg (1992) and Caswell and Mojduszka (1996) a credible ethical product label can help to overcome these problems through the conversion of a credence attribute (e.g. sustainability) into a search attribute. In the SRI context, Wins and Zwergel (2016) show that conventional investors on average do not trust in SRI funds whereas interested and sustainable investors on average do. However, when it comes to deciding which stock companies are sustainable and which are not, even sustainable and interested investors distrust the fund management to perform this task. They either want the fund management to be aided by an independent advisory committee or an external agency when evaluating a stocks' sustainability. This is in line with results presented by Haigh (2008), who suggests that investors' reluctance to purchase SRI funds is linked to investors' concerns with respect to the information integrity of SRI funds. Therefore, we state the following hypotheses:

H4a: An investor is more likely to invest in a sustainable fund with a credible sustainability certificate than without one.

According to Egels-Zandén et al. (2015) transparency is not consistently defined. Two main dimensions are presented in the literature. Egels-Zandén and Hansson (2015) state that for some transparency is traceability (i.e. the possibility to track a product´s flow from the sources of the raw materials to the end of the production process) and for others it is mainly disclosing sustainability conditions at suppliers. Consequently, Egels-Zandén and Hansson (2015) conclude that a company is fully transparent if both dimensions are fulfilled: Disclosing all its supplier names and the sustainability conditions at each of them. In the context of an equity fund this would mean that the investment company would have to disclose all the holdings of the fund (raw materials), the investment strategy (production process), and the (degree of) sustainability of the holdings in order to be fully transparent. Transparency (e.g. of supply chains) is often seen as a means to enable stakeholders (e.g. consumers) to hold firms accountable for their actions (e.g., Dingwerth and Eichinger, 2010 and Hess, 2007) or as a corporate tool for increasing revenues

through improved credibility, legitimacy, and trust (Egels-Zandén and Hansson, 2015). Based on interviews Bhaduri and Ha-Brookshire (2011) support the assertion that transparency has the potential to influence purchasing intentions of consumers. Using an experiment in an artificial online laboratory environment Bradu et al. (2014) show that a transparency label significantly increases a consumer's willingness to buy chocolate. Additionally, they demonstrate that consumers process the transparency label heuristically rather than systematically, i.e. they see the label as cue or signal independent of its content. Therefore, we state the following hypothesis:

H4b: An investor is more likely to invest in a fund with a transparency label than without one.

Finally, MacLean and Rebernak (2007) state that trust among stakeholders can be build best through transparency. Consequently, a sustainability label should be conceived to be more trustworthy when it is accompanied by a transparency label. Thus, we hypothesize:

H4c: An investor is more likely to invest a sustainable fund that has a transparency and a sustainability label.

4.3 Data, variables, and experimental design

The data stem from a survey, which was conducted in December 2013 and January 2014 in cooperation with the German market research institute GfK SE. The initial (online) representative sample contains 1001 randomly drawn respondents in German households. The respondents are persons who are at least 18 years old and mainly or equally responsible for the household's investment decisions. Additionally, we required the respondents to not only have a checking account, but at least (also) a savings account. Besides questions on socio-demographic factors, attitudes towards and perceptions of sustainable investments, the survey contains a DCE related to investment decisions on equity funds. As the DCE refers to investment decisions between several equity funds, we required a certain level of financial knowledge as prerequisite for attending the experiment (see section 4.3.2 on a detailed description). Only 801 of all 1001 survey participants fulfilled these requirements. For identifying (information) barriers preventing private investors from SRI market participation we only refer to the questionnaire part (see section 4.3.1). In order to examine whether labels could help to decrease information and

participation costs we combine the questionnaire and experimental data in the econometric analysis. The experimental design and the construction of resulting variables are introduced in section 4.3.2.

4.3.1 Description of variables for analyzing SRI market entry barriers

In order to identify investors that own sustainable investment products (and those who do not) while explicitly considering investors' heterogeneity, we used a filter question similar to Wins and Zwergel (2016). By asking the respondents to select one of the following statements, we are able to divide the respondents into four groups (investor group abbreviations in parentheses):

- I currently own sustainable investments and I will still invest in sustainable investments in the next three years. (sustainable and responsible investors, SR)
- I currently own sustainable investments, but I will not invest in sustainable investments any more in the next three years. (skeptical investors, SK)
- I currently do not own sustainable investments, but I will invest in sustainable investments in the next three years. (interested investors, INT)
- I currently do not own sustainable investments and I will not invest in sustainable investments in the next three years. (conventional investors, CONV)

109 of the 801 participants of the DCE are SR investors (13.61%), 83 respondents are SK investors (10.36%), and 248 respondents are INT investors (30.96%). The group of CONV investors is the biggest group containing 361 respondents, which corresponds to a share of 45.07%. Based on this classification, we construct three variables, which are used as dependent variables in the econometric analysis. The first variable 'Investor type' directly refers to the four different investor types and takes the value one if the respondent is a SR investor, two in case of SK investors, three for INT investors, and four if the respondent is a CONV investor. Besides this multinomial variable, we construct two dummy variables, namely 'Current SRI investor' and 'Potential SRI investor'. The first variable takes the value one if the respondent either belongs to the group of SR or SK investors and zero otherwise. 'Potential SRI investor' takes the value one if the respondent is either a SR or INT investor. A share of 23.97% of all respondents are current SRI investors and 44.57% are potential SRI investors for the future.

As we do not have observed bank account data of the respondents, we are not able to observe their real investment decisions, individual SRI market participation and related participation or information costs. Therefore, we try to identify and disentangle the individuals' perceived participation, information, and transaction costs for SRI market participation and related impact factors by asking the respondents to value certain statements. On this basis, we construct all explanatory variables.

In order to measure the individuals' knowledge of SRI we asked the respondents to state on a five point Likert scale (ranging from "I totally disagree" to "I totally agree" [26]) how strongly they agree to the statement "I know too little about sustainable investments.". On this basis, we construct the dummy variable 'Too little knowledge' that takes the value one if the respondent strongly agrees to the statement, i.e. selected either "I rather strongly agree" or "I totally agree". As reported in Table 20, 49.67% of the respondents self-assess their knowledge of SRI as too little.[27] As (additional) variable for measuring the individuals' degree of information on financial products in general, and thus their degree of financial sophistication, we ask the respondents about the information sources they use when they (actively) inform themselves before investing in a financial product. The respondents could make a multiple selection out of eight different information sources (conversations with a bank advisor, with family members or friends, newspapers, etc.), an "Open answer" option, and a "No answer" option. Based on these answers, we construct the count variable 'Number of information sources' reflecting the number of selected information sources. As reported in Table 20, the respondents use 2.53 information sources on average. As this measure relates to information on financial products in general and also captures the involvement of individuals in their investment decisions as they actively search for information, we further capture the respondents' degree of perceived information on SRI by asking them to state how strongly they agree to the statement "I feel poorly informed about sustainable investments", which is rather a passive measure.[28] The resulting dummy variable

[26] The respondents could additionally select a "No answer"-option. Respondents that chose the "No answer"-option are excluded from the econometric analysis. We used this scale also for all other statements when we asked for the respondents' degree of agreement.

[27] See section 4.1.1 for an in-depth analysis.

[28] Since we asked investors who were currently invested as well as investors with no current sustainable investments in their portfolio, we used two slightly different formulations for this question and also in case of the not yet introduced variables 'No offer by bank' and 'Distrust'. For instance, the groups of SR, SK and INT make their statements in the context "to which degree are the statements reasons why you decide not to invest more in sustainable investment products now or in the next three years". On the other hand, the CONV investors indicate

‘Poorly informed’ takes the value one if the respondent strongly agrees to this statement, and zero otherwise. Here, 61.33% of the investors feel poorly informed about sustainable investments. The investors’ perception of banks as intermediaries in context of SRI is captured with the statement “My bank has not offered me sustainable investments yet.”. As before, the resulting dummy variable, ‘No offer by bank’, takes the value one if the person strongly agrees to this statement (and zero otherwise), which occurs in 62.11% of all cases.

In order to examine whether distrust related to SRI is an important barrier for private investors, we connect with the questions used in Guiso et al. (2008) and Nilsson (2008) that captured personalized trust with respect to a bank, broker, or fund provider. Since we are interested in whether private investors trust SRI providers, and not banks in general, we asked the respondents how strongly they agree towards the statement “I do not trust that providers of sustainable investments follow the sustainability guidelines they publish in their investment information. “. The resulting dummy variable ‘Distrust’ takes the value one if the investors strongly agree to this statement and zero otherwise. It seems that the presence of distrust is not as severe as perceived lacks of information, as only 37.87% strongly agree to this statement.

For capturing the investors’ expectations and perceptions with respect to SRI’s return, risk, and fees compared to conventional investments we used similar questions as previous studies, for example Nilsson (2008) or Bauer and Smeets (2015). The respondents were asked to state on a five points scale whether they think that the average return (risk, or fees) of sustainable investments is much lower, rather lower, neither lower nor higher, rather higher, or much higher compared to conventional investment products. On this basis, we constructed three dummy variables: The variable ‘Lower return’ refers to the individuals’ perceptions of rates or returns of sustainable compared to conventional investments and takes the value one if the respondents value the rate or return of sustainable investments as “much lower” or “rather lower” than the return of conventional investment products. Further, we construct the variables ‘Higher risk’ and ‘Higher fees’ each taking the value one if the respondent chose “rather higher” or “much higher” with respect to the corresponding perception of risk or fees of sustainable compared to conventional investment products. 58.98% of the respondents expect lower relative returns of

their agreement to the same statements in the context “to which degree are the statements reasons why you do not invest in sustainable investments now or in the next three years”.

sustainable investments, while 33.08% (35.59%) perceive the risk (fees) of sustainable investments to be higher than for conventional investments. Finally, and in line with most previous studies on similar issues, we also consider the respondents' age, gender, income, and wealth for the purpose of including them as sociodemographic and –economic control variables in the microeconometric analysis. The variable 'Age' captures the individuals' age measured in years, the dummy variable 'Female' takes the value one if the respondent is a woman (and zero otherwise), the dummy variable 'Income' takes the value one if the monthly household's income exceeds 3000 euros (and zero otherwise), and the dummy variable 'Wealth' takes the value one if the monetary wealth of the households is larger than 50000 euros. The average age of the investors is 44.71 years, 43.95% of the investors are female, 49.92% of the households earn more than 3000 euros, and 29.93% of the households possess a monetary wealth of more than 50000 euros.

4.3.2 Experimental design

The DCE was set up to analyze investment decisions of private investors in context of sustainable and conventional investment products. The final experimental design was generated with Sawtooth software. To keep both the statistical efficiency as well as the precision of estimates of interaction terms in an acceptable level, a "Balanced Overlap" design approach was applied (e.g., Chrzan, 2000). In total 50 different versions of randomized choice sets are created and are assigned to the respondents. Since investing in equity funds requires a certain amount of knowledge of investments with variable returns, not all of the respondents were allowed to participate in the DCE. By using filter questions we ensured that only persons who have (or had) already invested in, or are sufficiently informed about mutual funds and stocks are included in the DCE. Thus, only 801 respondents took part in this experiment. At the beginning of the experiment every person got a detailed written description of the experimental setting. It was explained that each respondent faces eight consecutive decision tasks (choice sets) with four different equity funds in each choice set. For each choice set the respondents had the task to choose the fund they prefer most. The description informed the participant that all funds can be considered as totally identical except for the following attributes: The net return of the last year, the average annual net return of the last five years, the subscription fee, the sustainability criteria, and the transparency criteria. The first three attributes are financial criteria, whereas the attributes sustainability and transparency are non-financial. The attributes and their corresponding levels

are given in Table 21, while Table 22 shows an exemplary choice set. In this context the attribute sustainability marks equity funds that are constructed employing ecological, social, and/or ethical criteria. Equity funds with a sustainability label would additionally be awarded with a certificate assigned by an independent organization. Indicating whether a transparency label was provided by state or NGO states that the fund provider published sufficient information on the fund, such as a detailed investment strategy and holdings. The attributes that describe the respective funds profiles were carefully chosen based on existing studies (see e.g., Wilcox, 2003, Vyvyan et al., 2007) and substantial reviews of praxis. We conducted pretests among graduate students and the first 50 respondents of the survey thereby ensuring that the DCE's description and the decision tasks are easily comprehensible. Additionally, in order to mitigate hypothetical bias, every respondent was asked after the experiment whether they understood all aspects mentioned in the description or the experiment itself: 128 of all 801 respondents that took part in the DCE indicated that they had comprehension problems. Thus, we excluded them from the empirical analysis.

In order to examine the individual preferences regarding sustainability and transparency labels, we construct the variable 'Investment choice' that captures the individuals' investment decisions. Further, we create explanatory variables on basis of the attributes (and the corresponding levels): The variable 'Return last year' comprises the alternative's short-term return in the last year, the variable 'Return last five years' the average annual return in the last five years, and 'Subscription fee' captures the subscription fees of each fund. Further, we construct the dummy variable 'Transparency label' that takes the value one if the fund was labeled by a transparency logo (either by the state or an NGO) and zero otherwise. Finally, we construct the dummy variables 'Conventional fund', 'Sustainable fund', and 'Certified sustainable fund': The first variable takes the value one if no sustainability criteria are considered in the fund's investment strategy, 'Sustainable fund' takes the value one if sustainability criteria are considered in the fund's investment strategy, but no third independent organization verified this strategy with a certificate (and zero otherwise), and 'Certified sustainable fund' takes the value of one if sustainability criteria are considered in the fund's investments strategy and a third independent organization verified this.

4.3.3 Econometric approaches

In order to identify investment barriers for private investors, we analyze the corresponding descriptive statistics (see section 4.1.1), but additionally apply more sophisticated approaches: First, for analyzing the determinants of being currently invested in SRI ('Current SRI investor') and being a potential future SRI investor ('Potential SRI'), we take the binary nature of these variables into account and thus conduct the Maximum Likelihood (ML) method to estimate the parameters in binary probit models. Second, as the third dependent variable 'Investor type' can take four different values on a nominal scale, we apply multinomial logit models in this case. Again, the parameters are estimated by using the ML method (see e.g., Winkelmann and Boes, 2009, Greene, 2012, for a comprehensible explanation of both approaches).

To analyze the experimental investment decisions of the investors econometrically we make use of McFadden's (1974) conditional logit (CL) model. This particularly allows the analysis of the effects of the alternative-specific attributes (as shown in Table 21) on the individuals' choices between the different four alternatives in each choice set. Referring to Winkelmann and Boes (2009), we assume the following individual linear utility function:

$$U(z_{ij}) = z'_{ij}\gamma + \varepsilon_{ij} \quad \text{for i = 1, …, n; j = 1, …, 4}$$

where z_{ij} stand for the attributes of the *j*th alternative for observation *i*. The stochastic component of the utility function refers to the error term ε_{ij} that is assumed to be independently and identically standard extreme value distributed over all alternatives j and comprises all unobservable factors. Assuming (random) utility maximization, in every of the eight choice sets the investor chooses the equity fund that offers the highest utility among all four alternatives. Given these assumptions, the probability that individual *i* chooses alternative *j* is given by

$$\pi_{ij}(z_{i;}\gamma) = P(y_i = j|z_i;\gamma) = \frac{\exp(z'_{ij}\gamma)}{\sum_{r=1}^{J}\exp(z'_{ir}\gamma)} \quad \text{for i = 1, …, n; j = 1, …, 4}$$

with $z_i = (z_{i1}, z_{i2}, z_{i3}, z_{i4})$. The probabilities can be estimated by estimating $\hat{\gamma}$ using the ML method. Details of the explanatory variables entering the model are described above in section 4.3.2.

4.4 Empirical results

4.4.1 Analysis of SRI market participation barriers

4.4.1.1 Descriptive analysis

As mentioned in section 4.3.1, the dataset comprises 801 respondents: 109 of them are SR investors, 83 are SK investors, 248 are INT investors, and 361 are CONV investors. Since not all participants answered all questions, the dataset comprises certain missing values (the number of respondents is given by N).

Table 23 links the explanatory variables defined in section 4.3.1 to the four investor groups and hence respondents that selected the 'No answer' option have been dropped. By showing the results of one-sided t-tests of the proportions for all information and financial performance related explanatory variables mentioned in Table 20, pairwise comparisons between the four investor groups are conducted.

According to the results of the chi-squared tests of independence shown in Table 23, there is empirical evidence for stochastic dependency between the investor groups and each dummy variable capturing the different statements. When looking at the statement 'I feel poorly informed about sustainable investments' ('Poorly informed'), SR investors show the lowest percentage of respondents who agree with the statement. The corresponding t-tests further reveal that the share of SR investors feeling poorly informed is significantly smaller than the corresponding share of any other group. Indeed, more than half of all SK investors and considerably more than 60% of the INT or CONV investors agree that feeling poorly informed about sustainable investments is a reason why they do not invest (more) in SRI in the future. The results regarding 'Too little knowledge' about SRI products are quite similar to those of 'Poorly informed'. However, the share of investors agreeing to the related statement is smaller for every group and there is an even clear increasing trend from SR to CONV investors, i.e. the share of investors that self-assess their knowledge as too low is largest among CONV investors. The results for 'No offer by bank' reveal that almost 43% of the SR but also SK investors state that not having received an offer about sustainable investments by their bank yet is a reason for not investing (more) in SRI in the future. Contrary to the variables before, the proportions among SR and SK investors, i.e. respondents that are currently invested in SRI, are not significantly different from each other. Further, the proportion of INT investors is significantly larger than the corresponding share of

CONV investors. However, there seems to be a large discrepancy between already invested and not (yet) invested investors. The results regarding 'Distrust' are different. Again two groups emerge, but the percentages, for those who agree to the statement that the information of SRI products from investment companies cannot be trusted, is similar (i.e. the difference is not significant) for SR and INT and for SK and CONV investors. Hence, distrust seems to be an important factor for discriminating future potential investors (SR and INT) and those who are not planning to invest in SRI in the future (SK and CONV).

Regarding the three financial aspects, over 50% of the SK (INT, or CONV) investors perceive the return of sustainable investments to be lower compared to conventional products. In case of SR investors, the shares are almost equal. Concerning the dummy variable 'Higher risk' it becomes evident that the percentage of SR investors (19.6%) is significantly lower than the respective percentages of the other three investor groups. With respect to 'Higher fees' it can be seen that about a quarter of those who are currently invested in SRI (SR and SK investors) think that fees of SR investments are higher than that of conventional investments, whereas around 40% of those who are currently not invested in SRI agree to the aforementioned statement.

In summary, compared to the other three investor groups SR investors have the highest levels of knowledge and information, and lowest levels of distrust. Furthermore, they exhibit the lowest level regarding 'Higher risk' and have the second lowest level of 'Higher fees'. The other end of the spectrum is marked by the CONV investors. Compared to the other three investor groups CONV investors have the lowest level of knowledge, second highest level of distrust, and have the second lowest level after INT investors with respect to 'Poorly informed'. Furthermore, they exhibit the highest level regarding 'Higher risk' and 'Higher fees'. SK investors are a kind of hybrid of the other investor groups. They are similar to SR investors regarding 'No offer by bank' and 'Higher Fees' but more like INT investors regarding 'Too little knowledge', 'Lower return' and 'Higher risk' and more like CONV investors with respect to 'Distrust' and 'Poorly informed'. INT investors most strongly differ from SR and SK investors with respect to 'Poorly informed' and 'No offer by bank'. They are less knowledgeable, especially compared to SR investors and more poorly informed than SR and SK investors.

4.4.1.2 Estimation results

Table 24 reports the ML parameter estimates for the two binary probit models described in section 4.3.3 as well as the corresponding estimated average marginal and discrete probability effects. The first column in Table 24 considers the determinants (described in section 4.3) of the probability that an investor invests in SRI, i.e. we first follow most previous studies by only distinguishing between investors who are currently invested and those who are not invested in SRI. In line with hypothesis H1b, we find a significant negative correlation between the self-assessed knowledge of SRI ('Too little knowledge') and investing in SRI. The corresponding estimated discrete probability effect shown in the second column means that people with little self-assessed knowledge are on average 13.4 percentage points less likely to be a SRI investor than persons valuing their knowledge of SRI higher. 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 in SRI. Thinking of too high information costs as a barrier for private investors is also supported by the highly significant negative effect of 'No offer by bank' thus supporting H1d: the estimated probability of being a SRI investor is significantly lower (even 20.7 percentage points on average) for persons stating that their bank did not offer them sustainable investment products. As these investors received no offer for sustainable investment products by their bank they are confronted with higher searching and processing costs, because they have to search sustainable products and process related information on their own. Besides, there is no statistical hint that 'Poorly informed' or 'Number of information sources' are related to being currently invested in SRI and hence no empirical support for hypothesis H1a. We also find no robust support for hypothesis H1c: Though the estimated parameter of 'University degree' is positive and significant at the 10% significance level, the corresponding average discrete probability effect is not significant. When it comes to the interpretation of the effect of individuals perceived distrust towards SRI providers on SRI market participation, we find counterintuitive effects as this variable is significantly positively related to being an SRI investor. We argue that this effect could stem from the aforementioned problem that it could be misleading to think of SRI investors as one homogenous group, because the group of SRI investors contains both, SR and also SK investors. We address this 'problem' by using multinomial logit models at the end of this section. With respect to perceived financial performance of SRI compared to

conventional financial products the estimates reveal that the individuals' relative valuation of risk and fees plays an important role. As expected, both variables are significantly negatively correlated with being a SRI investor, which means support for the hypotheses H3b and H3c. However, we find no significant effect of 'Lower return' (H3a). In sum, we find empirical support for the rationale that too high (perceived) transaction costs are a barrier for SRI market participation. Finally, we find no robust significant effects of any of the included socio-demographic variables on investing in SRI.

When considering the barriers of a potential (or future) sustainable investor, i.e. by combining the two investor groups that plan to invest in SRI (SR and INT investors), we see partly large differences compared to the analysis regarding being currently invested in SRI with two exceptions. First, having too little knowledge of SRI is still a strong barrier. Second, perceiving the risk of sustainable investments higher compared to conventional investments is still highly significant and negative. However, now we find no empirical hint that the perception of fees has an effect on being a potential sustainable investor. Instead, perceiving the return of sustainable investments to be lower than those of conventional investments is now significant at a 10% significance level and negative, which supports hypothesis H3a. However, additional factors seem to determine the probability of being a potential investor: Particularly distrust in SRI providers seems to be an important issue as the estimated parameters and the corresponding discrete average effect is highly significantly negative. Hence, we find strong support for H2 in case of potential investors. Additionally, the estimated parameters and related discrete and marginal average probability effects for 'No offer by bank' and 'Number of information sources' are significant at significance levels of 10% and 1%, respectively, and positive. This shows that well informed investors, i.e. investors that use more information sources, tend to be more interested in future sustainable investments supporting H1a. However, this also shows that again banks as intermediaries play an important role. As 'No offer by bank' is now significantly positively correlated to the dependent variable shows at least two things: First, the sign changed compared to the first model, indicating that the latter result is mainly driven by INT investors. Hence and second, interested investors could be involved in sustainable investment if banks would offer them sustainable investment products. Finally, again sociodemographic control variables do not or only weakly, namely 'Age', affect future SRI market participation.

However, as explained before in the context of the first model, it might be problematic to think of SRI investors as one homogenous group. This issue might be even more severe in case of potential investors as we combine currently invested and a subclass of conventional investors. Consequently, we expand previous studies by additionally differentiating between the four investor groups described above and analyze each group on its own. As the interpretation of parameter estimates in multinomial logit models is more complex than in case of binary response models, we directly consider the estimated marginal and discrete probability effects based on the parameters estimates in the multinomial logit model. The results are presented in Table 25. In the case of SR investors, the estimation results reveal a significant negative relationship between too little knowledge of sustainable investments and being a SR investor, and thus provide empirical evidence for hypothesis H1b. The estimated average discrete probability effect amounts to -13.6 percentage points and has thus the largest impact on being a SR investor in terms of percentage points. We also find a significant negative probability effect for 'No offer by bank'. This again underlines the important role banks play as intermediary and for the development of the SRI market. Further, the estimation results reveal that the degree of information about financial issues in general ('Number of information sources') and individuals' education are positively correlated with being a SR investor supporting H1a and H1c. Hence, SR investors tend to be more financially sophisticated and better informed than the other investor groups. With respect to the perception of financial performance, only the perception of risk affects the probability of being a SR investor negatively and significantly, thus supporting H3b. Focusing on the estimated average discrete and marginal probability effects for SK investors shed some light on the previously discussed counterintuitive positive effect of 'Distrust' on being currently invested in SRI. Now it becomes clear that this effect is driven by SK investors, which seem to distrust SRI providers. Hence, distrust is not only a reason for CONV investors not to invest in SRI but also an explanation why some private investors might divest from SRI. Further, the significant negative coefficient for 'No offer by bank' seems to be a robust pattern among investors who are currently invested in SRI. However, in contrast to SR investors, 'Number of information sources' is significantly negatively related to being a SK investor. Thus, relatively better informed investors are less likely in the group of SK investors. Finally, regarding financial performance only the perception of fees has a significant negative impact, and there is a weak statistical hint at a 10% significance level that women tend to be SK investors. Considering the estimates for INT and

CONV investors underlines that it is important to divide the group of investors that are yet not invested in SRI into (at least) two groups. It becomes clear that INT investors (similar to SR investors) tend to be well informed about financial products in general. This is indicated by the estimated marginal probability effect for 'Number of information sources', which amounts to 3.2 percentage points. Beyond that, 'Distrust' in SRI providers is an important issue, and distrusting investors are less likely to be interested in SRI. However, the estimated discrete probability effects of 'Poorly informed' and 'No offer by bank' express the important barriers for interested investors. These investors, while being interested in SRI, seem not to have reached a state of information that makes them feel comfortable enough to invest in SRI. Obviously, banks could bridge this gap by making offers to this group of investors. In contrast, 'Number of information sources' is significantly negatively and 'Too little knowledge' positively related to being a CONV investor, indicating that these investors tend to be less sophisticated, hence supporting H1a and H1b. Further, the estimated discrete probability effect is significant at a significance level of 10% indicating that distrusting investors are more likely in the group of CONV investors, which supports H2. Finally, and in line with H3b, the perception that SRI are riskier than conventional investments significantly increases the probability of being a CONV investor.

To sum up, SR investors 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 INT investors are less likely invested in SRI if they feel poorly informed about SRI and if they received no offer by their bank. Therefore, the barriers for INT investors could potentially be pulled down by targeted information disclosure about SRI and direct offers by banks. Further, SK and CONV investors seem to distrust SRI providers preventing them from future investments in SRI. However, both also generally seem to be 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 SRI.

4.4.2 The impact of labels on investment decisions

We now examine whether the inclusion of transparency and sustainability labels influence the (stated) preferences of the different investor groups. Table 26 reports the ML parameter estimates for the dummy variables referring to the different attributes (as explained in section 4.3.2) for five different (sub-) samples. Model 1 contains the estimation results on the basis of all observations,

while in case of Model 2 to Model 5 the parameters are estimated based on the observations of individuals of each investor group. Almost all estimated parameters in both Panels of the table have a significant effect at a 1% significance level and all attributes affect the investors' preferences in reasonable and intuitively comprehensible directions: The estimated parameters for the short- and middle-term returns are positive and reveal that investors are more likely to choose an equity fund if the return increases, ceteris paribus. However, the results also show that the respondents are more focusing on the average return in the past five years than on the return of the last year meaning that they more strongly consider the mid-term financial performance of equity funds. Secondly, the attribute 'Subscriptions fee' has a significantly negative effect on the choice of the investors. With respect to the effect of certification schemes for sustainable funds, we find highly significant negative parameters for 'Sustainable fund' as well as 'Conventional fund' in all models reported in Panel A. In this Panel the base group comprises certified sustainable funds. In line with H4a this means that investors prefer to invest in certified sustainable funds. The inclusion of a transparency label has a highly significant and positive effect on the individuals' fund choice across all investor groups, thus supporting H4b. Accordingly, investors are more likely to select an equity fund with a transparency label than a fund without one.

In order to check hypothesis H4c, we include an interaction term between the dummy variables 'Transparency label' and 'Certified sustainable fund' in Panel B of Table 26. Therefore, we exclude the dummy variables 'Conventional fund' and 'Sustainable fund', which now serve as base category. The highly significant and positive estimated parameters for 'Transparency label' and 'Certified sustainable fund' again express the positive stated preferences of all investors for transparency labels and certified sustainable funds. Additionally, we find for the sample containing all investors as well as for the subsample of SR investors a significant interaction term ($\alpha = 10\%$) indicating even stronger positive stated preferences if a fund has both kinds of labels supporting hypothesis H4c.

However, the size of the parameters in Table 26 cannot be compared directly across the different models and in order to test whether the preferences for the different kinds of labels differ between the four investor groups, we include interaction terms between the corresponding variables ('Transparency label', 'Sustainable fund', and 'Conventional fund'*)* and a dummy variable for

each of the investor groups.[29] Further, for being able to compare all investor groups with each other, we use four different model specifications, each with a different investor type as base group. The ML estimates of the corresponding parameters are presented in Table 27. As the variables 'Return last year', 'Return last five years', and 'Subscription fee' are not interacted with the different group variables, the estimated parameters are identical in all four models. As before, we first see that all types of investors have positive preferences for funds with a transparency label compared to funds with no transparency label. However, now differences in the stated preferences between investor groups become visible. SR investors have significantly higher preferences for transparency labels than SK or CONV investors, as the interaction terms between 'Transparency label' and the dummy variables for SK or CONV investors in the first model are significantly negative. The estimation results in model 3 reveal a similar pattern in case of INT investors. The results reveal no significant differences between the preferences of SR and INT (SK and CONV) investors regarding transparency labels. Hence, while on average all investors have significant positive preferences for funds with a transparency label, we find that SR and INT investors are the groups most valuing these labels. With respect to the sustainability certificate, the results reveal that all investor groups prefer certified sustainable funds over both other fund types. Further, we find only weak statistical hints that the investor groups' preferences between sustainable funds without certificate and certified sustainable funds differ. Model 1 and 3 reveal that SR and INT investor are relatively more likely to choose a certified sustainable fund, rather than a conventional fund (or a sustainable fund without certificate) compared to SK or CONV investors. Generally, and as we have already seen in the analysis referring to the descriptive statistics or multinomial logit models, we again find similar patterns of behavior for SK and CONV investors on the one hand and SR and INT investors on the other hand. Indeed, the results reveal no significant differences between the stated preferences of SR and INT investors. Further, we only find a significant difference in the preferences between SK and CONV investor in case of certified sustainable funds. Here SK investors are relatively more likely to select a certified sustainable fund, rather than a conventional fund compared to CONV investors.

In summary, 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

[29] The construction of interaction terms and their interpretations are similar to those used by De Valck et al. (2014).

across investor groups and we find the highest positive stated preferences for transparency labels as well as for sustainability certificates among SR and INT investors. Hence, particularly investors who plan to invest in SRI in the future show interest in related labels. This finding is in line with the previous result that these two groups tend use more information sources when it comes to investment decisions in general. 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 of SRI market participation. Additionally, labels could also provide an opportunity to win SK and CONV investors for future SRI investments as they prefer these funds over sustainable and even conventional investments.

4.4.3 Robustness checks

In this section we briefly report several additional models and sample specifications that were conducted in order to check the above empirical results for robustness. For sake of brevity, the results are not presented in tables, but are available on request. In case of the analysis of SRI market participation barriers we additionally controlled for further socioeconomic variables, namely household's monthly net income and wealth. When considering net income (or wealth), the number of observations drops to 439 (390) individuals due to a huge number of missing values. However, the general patterns, particularly with respect to 'Too little knowledge', 'No offer by bank', 'Number of information sources', and perceived financial performance issues in Table 24 and Table 25 remain robust. Further, we find no empirical hint that income has an impact on investor group membership, whereas we find weak empirical hints that wealth has an estimated positive effect on being a SR investor (α =10%) and a negative effect on being a SK investor (α = 10%). When including wealth as explanatory variable, the significance of 'Distrust' for SK and CONV investors disappears, while 'No offer by bank' becomes highly significant and positive in case of CONV investors. When considering income as explanatory variable 'No offer by bank' also becomes positive and significant (α = 10%) in case of CONV investors, while 'Poorly informed' is negative and significant (α = 10%) for CONV investors. All other effects remain stable.

First, in order to mitigate the possible hypothetical bias in choice experiments, which means that people behave inconsistently and differently compared to real life decisions, and possibly overstate their true preferences, we included a certainty question after every choice set as for

example discussed by Fifer et al. (2014). They find that there is a strong relation between hypothetical bias and respondents' uncertainty. Thus, we formulated the question "Please, indicate the degree of certainty that you would choose the selected investment in a real investment situation", followed by a five point scale ranging from "Very uncertain" to "Very certain". We incorporate these results in the econometric analysis by excluding all individuals that answered "Very uncertain" or "Rather uncertain" to the certainty question (remember that we already excluded persons stating that they did not understand the experimental task). Further, we also checked whether the results change if we do not include all eight choice sets for each individual, but exclude the first and the last two decisions. In all cases the results are qualitatively similar and stable.

4.5 Conclusion

This empirical study examines potential barriers that might prevent private investors to invest in sustainable and responsible investment (SRI) products. It further investigates whether information related barriers, and hence information costs, can be decreased by transparency and/or sustainability labels. Our analysis is based on data from a unique representative online survey of financial decisions makers in German households. Thus, our dataset has many advantages over previous empirical studies in this research field, which often suffer from problems as self-selection bias (see e.g., Nilsson, 2008; Wins and Zwergel, 2016). We make use of a stated preferences discrete choice experiment giving us the opportunity to observe and analyze the (hypothetical) investment behavior of private investors with respect to transparency and sustainability labels in case of investment decisions related to equity funds.

The empirical analysis shows that it is important to account for investor heterogeneity by distinguishing between (several) different investors groups in the context of SRI instead of only distinguishing between two investor groups (investors who are currently invested in SRI and those who are not) as most studies do (see e.g., Junkus and Berry, 2010, McLachlan and Gardner, 2004). The four different groups we consider, namely socially responsible (SR), skeptical (SK), interested (INT), and conventional (CONV) investors, face different barriers, in their investment decision processes in the context of SRI, though too high (perceived) information costs regarding SRI are a reason for all four investors groups not to invest (more) in SRI. SR investors tend to be

more sophisticated and better informed about SRI, which supports findings by Wins and Zwergel (2016), but also about financial products in general and hence face lower information costs than the other three investor groups. Especially banks play an important role and investors are less likely invested in SRI if they received no offer by their bank. Indeed, this seems to be an important hurdle for INT investors, who feel poorly informed about SRI, although they seem to be well informed in financial matters in general. Therefore, the barriers for INT investors could potentially be reduced by targeted information disclosure about SRI and direct offers by banks. Further, SK and CONV investors seem to distrust information published by SRI providers (see e.g., Nilsson 2008 regarding CONV investors) preventing them from future investments in SRI. However, both also generally seem to be worse informed about financial investment products in general, which leads to the idea that also trustworthy information disclosure about SRI, such as sustainability or transparency labels, might enhance their willingness to invest in SRI.

Regarding (perceived) transaction costs we find that the relative valuation of risk plays the most important role since it is significantly negatively correlated with being a SR investor and a potential (or future) sustainable investor. With respect to perceived financial performance of SRI compared to conventional financial products the estimates show that the individuals' relative valuation of fees plays an important role only for SR investors, particularly SK investors, but not for potential (or future) sustainable investors. Whereas perceiving the return of sustainable investments to be lower than those of conventional investments is only marginally significant and negative for potential (or future) sustainable investors but not for SR investors.

As suggested by Caswell and Mojduszka (1996) a credible ethical product label can help to overcome problems of consumer skepticism about social and environmental assertions of products through the conversion of a credence attribute (e.g. sustainability) into a search attribute. We find support for that claim because all four investor groups have positive stated preferences for transparency labels as well as certified sustainable funds. However, there is obviously heterogeneity across investor groups. The highest positive stated preferences for transparency labels as well as for sustainability certificates are among SR and INT investors. Hence, particularly investors who plan to invest in SRI in the future show interest in related labels. This finding is in line with the previous result that these two groups tend to use more information sources when it comes to investment decisions. Hence, it seems to be natural that these groups

are also more interested in information provided via labels or certificates. The results further suggest that INT investors might invest in sustainable funds or SRI in general if they are guided by transparency or sustainability certificates as this would decrease their information costs and thus in turn their participation costs. Although, SR and INT investors have significantly higher positive stated preferences for both kinds of labels than SK or CONV investors. Labels, nevertheless, could also provide an opportunity to win SK and CONV investors for future SRI investments as they prefer these funds over sustainable and even conventional investments.

The conclusions presented above are quite robust. In case of the analysis of SRI market participation barriers, we additionally controlled for further socioeconomic variables which do not change the results much. Regarding the analysis of the choice data all robustness checks lead to qualitatively similar results.

The above shows that theory of participation costs by Vissing-Jorgensen (2004) and other authors is not only relevant regarding stock market participation but also quite suited to describe SRI market entry barriers. Yet, regarding our results some limitations remain. Although we took several countermeasures to reduce hypothetical bias we were probably not able to eliminate it completely as can be seen by the circumstance that SK and CONV investors prefer certified sustainable funds over sustainable and even conventional investments. Hence, it remains subject for further research to analyze the effect of labels on real investment behavior and investment decisions in context of SRI, for example in a field experiment. It would be particularly interesting whether investors behave differently before and after including a certain label scheme.

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5. Religion, political orientation, and sustainable behavior – An econometric analysis of individual consumption and investment decisions

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Abstract: This study aims to analyze the relationship between individual and regional religion, religiosity, and political orientation and individual sustainable behaviors, with a special focus on sustainable investment decisions. To this end, we econometrically analyze online representative survey data for financial decisions makers in German households, i.e. important actors in the largest economy in Europe. The analysis reveals a positive relationship between (religious) Catholics or Protestants as well as persons with a political left-wing or green party orientation and several sustainable behaviors, such as pro-environmental or pro-social purchases of food, clothes, cars, or investment decisions. We find qualitatively similar relationships when considering regional measures for religion and political orientation. This implies that these factors are positively related toward different behaviors independently of their degree of observability or importance in terms of irreversibility, thereby emphasizing the importance of social identity and categories for individual behavior in general. These results can be used for targeted information campaigns by politicians to enhance sustainable behaviors or acceptance for related policy measures.

Keywords: Sustainable and responsible behavior, investment and consumption behavior, household decisions, political orientation, religion

JEL: D12, D14, G11, Q56, Z12

5.1 Introduction

Confronted with today's environmental problems, such as global climate change, efforts for a transition process toward a sustainable economy seem inevitable. This, however, involves changes in many economic sectors and production processes, which have to be accompanied by pro-social and pro-environmental behavior at the individual level. This also means that finance flows have to be consistent with such transition processes, which is also mentioned in the Paris Agreement (UNFCCC, 2015). In order to derive well-targeted policy measures it is important to identify determinants of sustainable behaviors (e.g., Clark et al., 2003). Hence, this study considers the involvement of sustainability criteria, split into ecological or social/ethical issues, in a variety of individual behaviors, such as purchase and investment decisions. To this end, we link the literature strands of pro-environmental and pro-social (consumption) behavior with sustainable and responsible investments (SRI). This connection seems to be natural as SRI can be interpreted as "an extreme form of tastes for assets as consumption goods that are unrelated to returns" (Fama and French, 2007, p. 675).

Many approaches and models for explaining sustainable behavior are based on ideas from different disciplines, such as psychology, sociology, or economics (Axsen et al., 2012), and it is obvious that the set of determinants comprise various and often related factors (e.g., Bénabou and Tirole, 2010). Accordingly, previous studies show that individual psychological factors and personal attitudes affect individuals' consumption as well as investment decisions. By way of example, psychological benefits and losses, such as reputational gains, status reasons, altruism or warm glow (e.g., Dastrup et al., 2012; Kahn, 2007; Kotchen and Moore, 2008; Schwirplies and Ziegler, 2016), environmental awareness or concerns (e.g., Kotchen and Moore, 2008), but also socio-economic or -demographic factors, such as income or gender (e.g., Andorfer, 2013) can influence sustainable behavior. Studies in the specific context of SRI similarly find that at least some investors are values-driven (Derwall et al., 2011) and, for example, pro-social attitudes, intrinsic social preferences, or social identity can positively influence the willingness of individuals to invest in SRI (e.g., Bauer and Smeets, 2015; Nilsson, 2008; Riedl and Smeets, 2014; Wins and Zwergel, 2016).

However, in their seminal approach Akerlof and Kranton (2000) argue that individual decisions are not only affected by individual factors, but also by the individuals' social context or structure,

institutional constraints, and their position within their social environment, which shape their self-concept or identity and may lead to behavior in conformity with the prevailing social norms (see also Axsen et al., 2012; Stern et al., 1995). Akerlof and Kranton (2000) implement the influence of social context on individual identity in a standard utility maximizing framework by assuming an individual utility function that considers both the standard part expressing individual tastes, but also an additional part capturing individual identity. This part positively influences one's utility if the person behaves in conformity with the prevailing social norms of the corresponding social category, and negatively if it does not. By way of example, non-conforming persons might feel guilty, which decreases their utility (Delmas and Lessem, 2014). Accordingly, individuals can be understood as parts of social categories, such as members of clubs, communities, or religious groups, which constrain and influence individual behavior, and hence their behavior has to be analyzed within social or cultural context (e.g. Akerlof and Kranton, 2010; Axsen et al., 2012; Moisander, 2007). Several empirical studies on sustainable behavior support this approach, for example with respect to the consumption of ecological or fair trade coffee among women (Carlsson et al., 2010), or the conduction of offsetting measures (Blasch and Farsi, 2014; Schwirplies and Ziegler, 2016). Particularly, environmentally friendly behavior of friends, neighbors, and relatives (Welsch and Kühling, 2009), and the strength of ties with others influence individual pro-environmental and pro-social behavior (Videras et al., 2012). The degree of sociability of a person, i.e. the connectivity toward peers or with the community, also influences other economic behaviors, such as stock market participation (e.g., Hong et al., 2004). The explanation is that more social persons gain cheaper access to information via word-of-mouth communication, which is also a relevant information channel in context of different kinds of pro-environmental behaviors (e.g., Welsch and Kühling, 2009).

Within the abovementioned framework, religious affiliations and political orientation represent different categories, which are connected with specific social norms influencing individual behavior. Accordingly, sociological theory postulates an influence of the predominant local religion on cultural values and norms (e.g., Kumar et al., 2011; Salaber, 2013), and thus on individual behavior and decisions. Individuals particularly tend to behave in conformity with the prevailing social norms in so-called "moral communities", i.e. in communities with a high degree of religiosity (Welch et al., 1991). Hence, religion is one mean for enforcing social norms, particularly via second and third party enforcement, and empirical studies show strong influences

on a variety of individuals' economic attitudes and behaviors (e.g., Arruñada, 2010; Iannaccone, 1998; Kumar et al., 2011). This framework can also be connected to political orientation (e.g., Huddy, 2001; Unsworth and Fielding, 2014; Biscotti and D'Amico, 2016). Accordingly, individuals' values are shaped by the political orientation they identify with and tend to behave along these political views. Thus, as in the case of religion, one can expect that the dominant political orientation in a community or region affect personal views and thus (economic) decisions of persons within this region. Hence, individuals will tend to act in conformity with the political orientation or party they identify with. This is relevant, for example, in case of stock market participation (Kaustia and Torstila, 2011), but also in the context of sustainable behavior, which is often interpreted as expression of green or left-wing political orientation, and thus behavior in conformity with one's own identity and personal values (e.g., Kahn, 2007; Axsen et al., 2012). Political orientation, as "natural measure of preferences for social responsibility" (Di Giuli and Kostovetsky, 2014, p. 159), is further relevant for identifying which policy measures are accepted by citizens as prerequisite for successful implementations of policy measures, as for example climate policy agreements (e.g. Ziegler, 2015).

However, both the roles of religion and political orientation are seldom considered in empirical studies, although some provide statistical evidence that they seem to be relevant for economic behavior (e.g., Arruñada, 2010; Kaustia and Torstila, 2011), and also in the specific fields of pro-environmental behavior (e.g., Cui et al., 2015; Kahn, 2007), pro-social behavior (e.g., Andorfer, 2013; Andreoni et al., 2016; Doran and Natale, 2011), and SRI or socially controversial investments (e.g., Salaber, 2013; Hong and Kostovetsky, 2012). However, these studies neither considered various behaviors nor different regional and individual measures of religion (or religiosity) and political orientation in the same empirical analysis. Though this appears to be necessary as, for example, Renneboog and Spaenjers (2012) mention with respect to the appropriate measurement of religiosity that religious affiliation is only an indirect measure and imperfect proxy for religiosity. Further, as shown in section 5.2, most studies focus on the USA and it is an empirical question whether these results are externally valid.

To this end, we empirically analyze a large dataset containing information on 1001 financial decision makers in German households that was constructed on the basis of a broad (online) representative survey. Hence, we are able to examine ecological and social/ethical conscious

consumption and investment behaviors of persons who are mainly or at least equally responsible for financial decisions of households in the largest economy in Europe. Therefore, the individuals were additionally asked about their political preferences, religiosity, voluntary activities, and a large set of socioeconomic and -demographic variables. We merge this dataset with regional information on religiosity and political preferences at the zip code level, in order to identify both the importance of regional context and individual factors on individual pro-environmental and pro-social behavior.

Indeed, our empirical analysis reveals both regional and individual positive effects of (Christian) religion or religiosity and political left-wing or green orientation on a wide variety of pro-environmental and pro-social behaviors. This holds for a variety of consumption fields, but also investment decisions. In contrast to previous studies we find rather a positive relationship between individual religiosity and the consideration of ecological criteria in investment decisions, but not in the case of pro-social criteria. Hence, we see that these factors positively affect different behaviors independently of their degree of observability or importance in terms of irreversibility. Hence, this paper contributes to three strands of literature, namely sustainable (consumption) behavior in general, (sustainable) investment decisions of private investors, and the role of religion and political orientation on individual decisions making. Thereby we help to close the empirical gap with respect to religion (or political orientation) and pro-environmental investment decisions, but also the relationship between political orientation and pro-social behavior, e.g. fair trade consumption.

The remainder of this paper is structured as follows. Section 5.2 provides a literature review of theories and empirical studies on individual pro-environmental (section 5.2.1) and pro-social behavior (section 5.2.2) in context of individual and regional religiosity and political orientation. Section 5.3 describes the datasets and explains the construction of variables as well as the econometric approaches used in the empirical analysis. Section 5.4 reports the empirical results and robustness checks. Section 5.5 concludes, discusses the results, and makes proposals for further research.

5.2 Literature review and hypotheses

5.2.1 Pro-environmental behavior…

… and religion

Theory generally provides arguments for both a negative and positive effect of Christian religion on pro-environmental behavior.[30] White's (1967) so-called dominion hypothesis assumes an anthropocentric Christian view in Western societies meaning that humans have dominion over the earth and nature and thus postulates a negative effect of Christianity on pro-environmental activities (e.g., Martin and Bateman, 2014; Cui et al., 2015). Contrarily, the stewardship hypothesis (with roots in the Old Testament) demands individuals to preserve the environment. Thus, on this basis one could expect a positive effect of (Christian) religion on pro-environmental behavior (e.g., Cui et al., 2015).

Related sociological and psychological empirical studies, as reported in Martin and Bateman (2014) provide ambiguous evidence, i.e. some support the dominion hypothesis, whereas others find evidence for the stewardship hypothesis. Accordingly, Martin and Bateman (2014) investigate the effect of intrapersonal religious commitment on various environmental behaviors thereby testing the dominion hypothesis. They asked US students how often they performed environmental behaviors (e.g. donating money to an environmental organization, recycling glass, watching TV about environmental issues, etc.) in the past. Contrary to the dominion hypothesis, they find that Judeo-Christians were more likely to behave environmentally friendly in four of the six different behaviors. However, their results are not robust and the effects become insignificant when they include additional control variables, except for money donation to an environmental organization. Cui et al. (2015) examine the effect of regional religiosity, measured by the share of religious adherents in a county, the share of Catholics, mainline Protestants, and evangelical Protestants, on the environmental performance of US companies. To this end, they use environmental performance ratings published in the Kinder, Lydenberg, and Domini's Stats database (KLD). They find a significant negative relationship between regional religiosity, mainline Protestants affiliation, or evangelical Protestant affiliation with environmental performance. Consequently, they interpret their results as empirical evidence for the dominion

[30] Similar like Renneboog and Spaenjers (2012) we focus on the main Christian religions, namely Catholics and Protestants, as these are the major religious affiliations in Germany.

hypothesis. Axsen et al. (2012) find, again based on data for the USA, weak hints that pro-environmental activities are positively correlated with a charity-religion lifestyle. However, they do not consider different religious affiliations nor other dimensions of religiosity, since religion was not the core of this paper. Hence, while there is obviously a relationship between Christian religion or religiosity and pro-environmental behavior in the USA, it is empirically unclear whether this also holds for Germany and, if so, whether they are positively or negatively related to each other. Hence, we state two hypotheses (hypotheses 1a and 1b) assuming a negative relationship between individual and regional Christian religion and religiosity, i.e. representing the dominion hypothesis, and also two corresponding hypotheses expressing the stewardship hypothesis (hypotheses 1c and 1d). Due to brevity reasons we summarize these and all following hypotheses in Table 28.

Though there are several studies examining the relationship between religion and investment decisions in general, or the consideration of social/ethical criteria in investment decisions in particular (as discussed in section 5.2.2), we are not aware of any study analyzing the link between religion and the importance of environmental issues in investment decisions. However, the Evangelical Church in Germany (EdK, 2013) and the Central Committee of German Catholics (ZdK, 2015) recently published guidelines on SRI for institutional but also private investors. Besides emphasizing ethical and social issues on the basis of Christian values, both churches stress the integrity of creation, and thus the importance of considering ecological criteria in investment decisions. Accordingly, and by analogy with hypotheses 1c and 1d, we expect a positive relationship between individual and regional Christian religion or religiosity and the consideration of ecological criteria in investment decisions, which we condense in the hypotheses 1e and 1f in Table 28.

… and political orientation

Expectations regarding the effect of left-wing or right-wing political ideologies on pro-environmental behavior seem to be clear cut and intuitive from a theoretical perspective. Left-wing ideology in general, and green party preferences in particular, are mainly positively associated with pro-environmental decisions, beliefs or attitudes (e.g., Costa and Kahn, 2013; Dunlap and McCright, 2008; Kahn, 2007). Based on German data, Schumacher (2014) finds that voting for the German Green Party is positively related to beliefs of the extent of global

environmental problems. Indeed, for example, empirical studies for the USA (e.g. Dunlap and McCright, 2008; Ziegler, 2015), Australia (Unsworth and Fielding, 2014), and Germany (Ziegler, 2015) show that conservative or right-aligned political views are negatively related to climate change beliefs, the perception of human contribution to climate change, and support for climate policy.

Empirical studies in the economic literature analyzing the relationship between political orientation and pro-environmental behavior mainly focus on the USA. For example, Kahn (2007) shows for California, USA, that households living in communities with a higher share of registered Green Party voters use less gasoline, locate more green businesses, are less likely to own an SUV, and also more likely to use public transit vehicles or purchase hybrid vehicles. Kahn (2007) explains these results by group conform behavior or the individual desire to own green community-specific status symbols, such as a hybrid vehicle. Hence, the visibility of behaviors seems to be important. In order to identify determinants of solar panel installations, Dastrup et al. (2012) examine the solar price premium for two regions in California, USA, and find a positive correlation between households consisting completely of supporters of liberal parties, (i.e. the Democratic Party, Peace and Freedom Party, or Green Party) and living in a solar home. They also consider regional proxies for environmentalism, e.g. the share of registered Democratic and Green Party voters in each census tract, and find that communities with a larger share of these voters are more likely to install solar panels and willing to pay price premiums. Costa and Kahn (2013) analyze data stemming from a Western United States electric utility and empirically show that liberal households, which are defined as above, consume less energy than others. Splitting these groups into their basic components shows that voters of the Green party consume 15.5% less electricity and Democrats at least 5.1%. In addition, the fraction of liberal registered voters in a community has a negative effect on electricity consumption. They conclude that ideology affects energy consumption and not peer pressure as energy consumption is not observable by neighbors. Again on the basis of US data, Attari et al. (2009) find in an experimental setting no significant relationship between Democratic, Republican, and Independent voters on the willingness to purchase low emission cars or increase green energy usage. By conducting a content analysis based on country level data for Italy, Biscotti and D'Amico (2016) investigate what determines environmental attitudes of political leaders and find that political leaders from left-wing parties are more likely to address environmental issues what

is explained by the politicians' desire to behave in conformity with group norms. Thus, based on these studies we formulate the hypotheses 2a and 2b, both expecting a positive relationship between individual and regional preferences for the Green Party or left-wing parties and the consideration of ecological criteria in purchase and consumption decisions (see Table 28).

Studies on the relationship between political orientation and the role of environmental issues in investment decisions are rare. Previous studies on individual investment behavior and SRI, such as Bauer and Smeets (2015), Nilsson (2008), or Wins and Zwergel (2016) do not control for political orientation. However, this lack of studies is not surprising as SRI is historically grown from an ethical development (e.g., Renneboog and Spaenjers, 2012). To the best of our knowledge, only Hood et al. (2014) directly consider this relationship by analyzing individuals' stock holdings of US firms and find unexpected results. Their estimates indicate that investors from Democratic counties are less likely to invest in stocks with environmental strengths in terms of KLD ratings. Further, they find no significant effect with respect to investments in stocks with a bad environmental performance. Di Giuli and Kostovetsky (2014) find that firms have a better CSR performance (also based on KLD ratings) if, for example, they are based in states with a larger share of votes for the Democratic presidential candidate, or also for firms with Democratic founders (identified based on their donation behavior). Accordingly, both the internal, but also the external political environment influence sustainability performance of firms. Although Di Giuli and Kostovetsky (2014) consider all dimensions of sustainability in an aggregated measure, which thus cannot be directly related to pro-environmental behavior, we formulate our hypotheses 2c and 2d (see Table 28) in line with these results and those aforementioned in case of consumption behavior. I.e. we expect a positive relationship between individual and regional preferences for the Green Party or left-wing parties and environmentally conscious investment decisions.

5.2.2 Pro-social behavior…

… and religion

Empirical studies investigating the effect of religion on pro-social behavior in context of consumption decisions is also rather scarce, although there is, just as in the case of SRI, also a historical component between fair trade consumption, as means of pro-social behavior, and religious organizations (Doran and Natale, 2011). Accordingly, Doran and Natale (2011)

consider the influence of religion on pro-social behavior by examining consumption of fair trade products. They interview customers of four fair trade retailers about their commitment to fair trade product purchases, their perception of how strongly religious beliefs affect their purchase decisions, and the religion they mostly identify with. Hence, they also included other religions than the Christian religion. They find that religious commitment and religious affiliation (weakly) affect fair trade product consumption. Catholics and Protestants behave significantly different compared to non-religious persons, and interestingly, are less likely to buy these kinds of products. Andorfer (2013) also examines the determinants of fair trade consumption based on biannual data from the "Environmental Awareness in Germany"-survey. She argues that Christian values are in line with those underlying fair trade consumption and thus religiosity should positively influence the willingness to pay for these products. Indeed, the empirical analysis reveals that religiousness positively effects the willingness to pay for fair trade products in Germany. In a recent study, Andreoni et al. (2016) examine the effect of religious diversity on individual contributions to charity based on Canadian tax records and census data. They find a significant positive effect for Catholics' contributions if their share in the population rise. However, they mention themselves that their results have to be interpreted with caution due to data issues. Hence, though Doran and Natale (2011) find negative effects, we follow particularly Andorfer (2013)'s findings as her study is based on data for Germany and expect a positive relationship between Christian religion or religiosity on both the individual and regional level and the consideration of social/ethical criteria in purchase or consumption decisions. These expectations are summarized under hypothesis 3a and 3b (see Table 28).

In context of individual investment behavior, it is natural to ask for the relationship between religion and the degree of religiosity and SRI investment behavior as SRI has its origins in religion (e.g., Renneboog et al., 2008a). The vast majority of studies in this area focus on socially controversial investment behavior in the USA (an exception is Salaber, 2013). This is typically defined as investments in sin stocks (or socially sensitive stocks), i.e. firms or investment products that are related to the tobacco, gambling, or alcohol industry (e.g., Borgers et al., 2015; Hood et al., 2014). Further, all these studies only consider measures for regional religiosity (e.g., Hood et al., 2014; Kumar and Page, 2014; Salaber, 2013), but none uses data on the individual level. Nonetheless, these studies reveal some interesting insights. Salaber (2013) argues that social norms, measured by a country's predominated religious affiliation, influence investors'

preferences regarding sin stocks and thus lead to risk premiums for sin stocks. Indeed, she finds empirical evidence for sin stock premiums in Protestant European countries. This is explained by the idea that Catholics do not consider alcohol and tobacco as sinful. Hence, particularly Protestants should shun these stocks, which leads to risk premiums. Kumar and Page (2014) find that institutional investors located in US counties with a larger Catholic to Protestant ratio invest a larger share of their portfolio in sin stocks. They also argue that the Catholic Church is more tolerant towards sin stock industries than Protestants. For the US, Hood et al. (2014) find that investors living in areas with large shares of Christians invest less in stocks with progressive labor policies for homosexuals. Further, investors living in counties with a large amount of Catholics are significantly more likely to invest in sin stocks in general and in tobacco stocks in particular. This indicates that the definition of sin varies across different Christian affiliations. Borgers et al. (2015) analyze holdings of mutual funds in the USA and find that funds that are headquartered in more religious states are more exposed to sin stocks. While arguing that social norms prevalent in the state of the fund provider affect fund managers, however, neither the dominance of Catholics nor Protestants in a state leads to a reduction of sin stock investment by the fund manager. Hence, these studies suggest a positive effect of Christian religiosity, but also that Catholics are more tolerant towards social controversial behavior than Protestants, for example with respect to consumption of alcohol or tobacco. However, since both the Evangelical Church in Germany as well as the Central Committee of German Catholics recommend to exclude these industries from the investment universe, we expect no difference between Catholics and Protestants for Germany (see EdK, 2013; ZdK, 2015). Thus, we only derive the hypotheses 3c and 3d expressing a positive relationship between individual and regional Catholic (and Protestant) religion and the consideration of social/ethical criteria in investment decisions.

… and political orientation

Finally, to the best of our knowledge, there is no existing study analyzing the relationship between pro-social consumption behavior and political orientation. Hence, we only refer to the financial literature to derive hypotheses. Hong and Kostovetsky (2012) argue that investors increase utility if they restrain to invest in firms mismatching their personal values, and thus expect that Republican- and Democratic-leaning managers assess SRI differently. Consequently, they examine stock holdings of US fund managers and find that managers donating money to the

Democratic Party hold lower shares of socially controversial stocks in their portfolio in relation to Republican Party contributors and non-donors. The already mentioned study by Hood et al. (2014) also considers the relationship between investors living in Democratic-leaning counties and investment in stocks with social strengths or concerns. They find that investors from counties with a larger share of Democrats hold larger shares of stocks with strengths regarding women and minority rights, or gay and lesbian rights. However, with respect to typical sin stocks they find contradictory results: Although investors from Democratic-leaning counties were less likely to invest in alcohol companies, they were more likely to hold stocks from gambling companies. Borgers et al. (2015) also control for the influence of political preferences by considering whether the fund is headquartered in Democratic- or Republican leaning states. While they find a lower sin stock exposure in Democratic-leaning states, they unexpectedly also reveal that funds based in states with strong Democratic Party preferences are more exposed to stocks with ESG concerns (lower exposure to stocks with ESG strengths). However, it should be noticed that they also included a dummy variable capturing strong Republican Party preferences, i.e. the case group is very heterogeneous and differently defined compared to other studies. Finally, we again refer to Di Giuli and Kostovetsky (2014) who find a significant relationship of between Democratic-leaning company founders and CSR performance. Hence, we state the following hypotheses 4a through to 4d that express a positive relationship between green and left-wing political orientation and pro-social purchase, consumption, and investment decisions on both the individual and regional level (see Table 28).

5.3 Data, variables, and econometric approaches

The empirical analysis is based on two data sources. First, we use information on individuals' self-stated consumption, travel, transportation, and investment behavior, which stem from a broad (online) representative (with respect to age, gender, and region) survey that took place during December 2013 and January 2014. The survey was conducted in cooperation with the German market research institute GfK (Gesellschaft für Konsumforschung, Nuremberg) that recruited the respondents from an online panel. We interviewed 1173 financial decision makers in German households, which were defined as persons who are at least 18 years of age, mainly or equally responsible for the household's financial decisions, and hold at least a savings account. Using a

quality saving system provided by the GfK, the interviews were filtered for qualitatively bad questionnaires and consequently 172 respondents were excluded, resulting in a final sample of 1001 respondents. In order to consider potential community and regional effects, we secondly make use of zip code level data. Here, we consider the second vote shares the political parties received in the German parliamentary election of 2013 within each zip code area as well as the share of Catholics and Protestants within these regions on the basis of census data.

5.3.1 Dependent variables

We asked five different questions in order to get information on how strongly the individuals consider ecological and social/ethical issues in decisions with respect to consumption, choice of transportation modes, travel behavior, and investments. For capturing the importance of ecological issues for private activities and behaviors, we asked the respondents to state how strongly they consider ecological criteria with respect to the choice of means of transport, frequency of car use, frequency of private journeys, frequency of flights, the choice of holiday destinations, and frequency of meat and dairy product consumption. The respondents were asked to answer on a five-point Likert scale with the categories “very weakly”, “rather weakly”, “neither strongly nor weakly”, “rather strongly”, and “very strongly”. We also added a no-choice option. Based on these statements we derive the ordinal variables ‘Choice transport’, ‘Freq. car’, ‘Freq. travel’, ‘Choice destination’, and ‘Freq. meat and milk’. Each variable takes the value one if the respondent selects “very weakly”, two for “rather weakly”, three for “neither strongly nor weakly”, four for “rather strongly”, and five for “very strongly”. In all cases, we excluded respondents that chose the no-choice option. Additionally, we create the variable ‘Eco activity index’ counting how many times a respondent selected either “rather strongly” or “very strongly” with respect to the six different activities. Hence, this variable serves as a measure of individual ecological importance in (daily) life activities, while a higher value indicates a stronger consideration of ecological issues in private behavior. The corresponding descriptive statistics are reported in Table 29 and Table 30. Approximately 40% of the respondents tend to strongly consider ecological issues with respect to the choice of means of transportation, frequency of car usage, and frequency of milk and dairy product consumption. Further, on average the respondents strongly consider ecological issues in almost two of the given six activities.

The second and third question are included to measure the importance of ecological and social/ethical aspects particularly in purchase decisions. We asked to state how strongly they consider ecological criteria (for example, low energy usage, low contamination of land, environmental friendly components) when purchasing electronic devices, clothes, cars, or food. We used the same five-point Likert scale as before, and analogously constructed the ordinal variables 'Eco electronic', 'Eco clothes', 'Eco car', and 'Eco food'. Additionally, we derive the variable 'Eco purchases index' measuring the importance of ecological criteria in purchase decisions by counting how many times how many times a person chose either "rather strongly" or "very strongly". For considering a broad measure for ecological behavior, we create the variable 'Eco index', which is the sum of 'Eco activity index' and 'Eco purchases index' and hence ranges between zero and ten. We measured the importance of social/ethical issues in purchase decisions by listing the same four consumption fields as above and asked the respondents to state how strongly they consider social or ethical criteria (for example, compliance with employees' and human rights, fair trade, dismissal of immoral business practices) when purchasing these kinds of products. Accordingly, we create the ordinal variables 'Social electronic', 'Social clothes', 'Social car', and 'Social food'. Again, we create a count data variable ('Social purchases index') in the same manner we already constructed 'Eco activity index' and 'Eco purchases index'. This variable serves as an indicator for the consideration of social/ethical criteria in purchase decisions, i.e. pro-social behavior. The descriptive statistics presented in Table 29 reveal that ecological issues seem to be most important when purchasing electronic devices (or cars) as 63% (56%) of the respondents state to strongly consider ecological criteria when buying such a product. However, also 48% of the respondents consider ecological criteria when buying food. On average ecological criteria are considered in two out of the four given purchase situations. Social/ethical issues seem to be less important than ecological criteria, as the mean of the 'Social purchases index' is only 1.35 (see Table 30). Only in case of clothes people put more weight on social/ethical than on ecological criteria (40% versus 30%). Additionally, social/ethical criteria are mostly considered when purchasing food (41%). This is both not surprising as fair trade is most often referred to the production of these kinds of commodities (e.g., Andorfer and Liebe, 2012).

Finally, for being able to connect consumption and activity patterns to individual investment behavior, we asked two similar questions in context of consumption decisions: "Please indicate

how strongly you consider ecological criteria when making investment choices.", and "Please indicate how strongly you consider social or ethical criteria when making investment choices". On this basis, we derive two ordinal variables ('Eco invest' and 'Social invest') with the same scales as above and also construct the dummy variables 'Dummy: Eco Invest' and 'Dummy: Social Investment' each taking the value one if the respondent stated to rather or very strongly considering these criteria in investment decisions. Here, the corresponding descriptive measures in Table 29 and Table 30 show that only approximately 20% of the respondents consider ecological or social/ethical criteria in their investment decisions. This is distinctly lower compared to other activities or purchase decisions.

5.3.2 Independent variables

For measuring individual religiosity and to examine differences between the main Christian affiliations we construct dummy variables for different religious affiliations, which is quite standard (e.g., Iannaccone, 1998; Arruñada, 2010). As Catholicism and Protestantism are the dominating confessions in Germany, and hence there are differences in comparison to more religious countries like the USA, we follow Renneboog and Spaenjers (2012)'s analysis for Dutch households, since the religious situation in the Netherlands is similar to Germany's. Hence, we asked the respondents about their religious affiliations and conditional on these answers, we asked all persons with an affiliation for the number of days per week they actively pursue their religion (for example, pray).[31] We included the second question as religious affiliation alone might not sufficiently, and only indirectly measure individual religiosity (e.g., Renneboog and Spaenjers, 2012).[32] Based on these two questions, we created the dummy variables 'Catholic', 'Protestant', 'Other religion', 'Religiously active C+P', and 'Religiously active others' that take the value one if the respondents are Catholic, Protestant, members of another religion, Catholic or Protestant and follow their religion at least once per week, or member of another religion and follow their religion at least once per week, respectively. Table 31 shows that 901 respondents answered the question about their religious affiliation: 26% of them are Catholics, 30% are Protestants, and the majority of these respondents stated to have no religious affiliation (39%). Only 362 respondents of the 547 persons with a religious affiliation

[31] See for example Hong et al. (2004) who use a similar question.

[32] We also asked the respondents to self-assess their religious strength on a five-point Likert-Scale. However, due to multicollinearity issues we do not include this variable in the main analysis, but in the robustness checks in Section 5.4.3.

reported on how many days per week they attend religious activities. As we additionally assumed that all persons with no religious affiliation pursue their religion on zero days per week, we finally see that about 26% of the 716 persons who answered the question on their religious affiliation actively pursue their religion.

We use zip code level census data for the year 2011 published by The Federal Statistical Office of Germany in May 2013 (see Statistisches Bundesamt, 2013) to measure regional religion. We asked the participants of the survey for their zip code, and are thus able to match regional and individual information. Accordingly, we constructed the variables 'Share of Catholics' and 'Share of Protestants' containing the fraction of Catholic and Protestants adherents in the zip code area of each respondent, respectively.[33] Table 34 shows that the average regional shares of Catholics (30%) and Protestants (31%) are nearly equal.[34]

Similarly, we use individual as well as regional information to examine the effect of political orientation. We measure individual political orientation by asking the respondents to indicate which party they generally prefer (even if they vote for another party from time to time) and we offered a list with the seven most popular German parties at the time of the survey.[35] In order to take the German party system into account and as we consider pro-environmental and pro-social behavior, we do not only create a dummy variable capturing left-wing preferences versus right-wing preferences (e.g., Costa and Kahn, 2013; Di Giuli and Kostovetsky, 2014), but, instead, distinguish between three different parties reflecting different individual political views (see Dastrup et al., 2012 in the U.S. context). The dummy variable 'SPD' takes the value one if the respondent generally prefers the Social Democratic Party of Germany. Analogously, we define the dummy variables 'Left Party' (for The Left Party, post-communist party in Germany) and 'Green Party' (for 'Bündnis 90 / Die Grünen', the German Green Party).[36] On average, 36% of

[33] We also include the auxiliary variable 'Share of others' that contains the share of other religions, but also the share of unknown persons. Thereby, we ensure that the share of non-adherents serves as reference group.

[34] Following previous studies by Salaber (2013), Kumar et al. (2011), and Kumar and Page (2014) we also created other measures for religion and religiosity (see section 5.4.3). However, 'Share of Catholics' and 'Share of Protestants' reveal the most informative estimation results in our case.

[35] We included the Christian Democratic Party (CDU/CSU), Social Democratic Party (SPD), Liberal Party (FDP), Green Party (Bündnis 90 / Die Grünen), Left Party (Die Linke), Alternative for Germany (AfD), Pirate Party (Piratenpartei), and the options „Another party", and „No answer".

[36] According to figures for April 2013 and October 2014 published by the political and electoral research institute infratest dimap (2015), both parties were clearly on the left hand side of a left-right scale at both time periods. The Green Party typically represents green and protest views (Schumacher, 2014) and is also located on the left side on a left-right-scale (infratest dimap, 2015).

the respondents are left-wing voters (SPD: 26%, Left Party: 10%), while 13% support the Green Party (see Table 31).[37] Regional political orientation is again measured for each zip code area. We use the proportion of second votes from the German federal election in September 2013 that were published by the Federal Statistical Office and the statistical offices of the Länder (Statistische Ämter des Bundes und der Länder, 2016).[38] The regional variables are defined similarly to the individual definitions above: The variables 'SPD share', 'Left Party share', and 'Green Party share' contain the sum of the shares of second votes for the SPD, the Left Party, or the Green Party for each zip code area, respectively.

Further, to control for the impact of social interactions[39] (or sociability) and environmental or green values, we asked the respondents whether they are involved in voluntary activities (following e.g. Hong et al., 2004) and, secondly, whether they are engaged in a group or organization protecting the environment or nature (e.g., Kotchen and Moore, 2008). On this basis, we construct the dummy variables 'Voluntarily active' and 'Environmental organization'. Table 31 shows that 40% of the 960 respondents who answered the corresponding question are voluntarily active, while 10% are member of an environmental organization.

We also include a large variety of socioeconomic and –demographic variables. The sample mean of age is 43.91 years (variable 'Age'), 49% of the respondents are female ('Female'), 35% have at university degree ('University degree'), 51% are married ('Married'), and 31% have children under 18 years of age living in their household ('Kids'). Finally, we asked the respondents for their monthly net income and constructed the dummy variable 'Income' that takes the value one if the household's monthly net income exceeds an amount of 3000 euros, which occurs in 47% of cases (based on 808 answers).

[37] These figures are very close to those published by the German opinion research institute infratest dimap for December 2013 (see infratest dimap (2013)).

[38] Election results for six Thuringian counties are not listed in this dataset and were additionally collected from the official website of the Thüringer Landesamt für Statistik (2016).

[39] Hence, we follow a similar approach as conducted by Georgarakos and Pasini (2011) who use information from the SHARE dataset for the year 2004 and measure sociability with a binary variable that takes the value one if (at least) one household member does voluntary or charity work, is member of a club, and/or politically active. However, contrary to the measurement of religiosity or political orientation, due to lack of information, we cannot include the degree of sociability at the community level, as for example Brown et al. (2008) do.

5.3.3 Econometric approaches

We first analyze general pro-environmental and pro-social behavior by considering the different index variables 'Eco activity index', 'Eco purchases index', 'Eco index', and 'Social purchases index' as dependent variables. As these variables count the number of times a respondent states to consider ecological or social/ethical criteria in the given context, it is appropriate to apply count data models to take this specific scale into account. According to Winkelmann and Boes (2009), in this case the Poisson regression model can be applied under the assumption that the conditional expectation function is equal to the conditional variance function (equidispersion), which follows directly from assuming that the dependent count variable is conditionally Poisson distributed. Under the additional assumption of independent observations, the parameters in these models can be consistently estimated by the Maximum Likelihood (ML) method. However, this approach does not allow for unobserved heterogeneity meaning that the included explanatory variables fully explain the variation in the dependent variable. In case that one does not observe all relevant factors, the dependent variable is not conditionally Poisson distributed and consequently the model would be misspecified. This additionally leads to overdispersion, i.e. the assumption of equidispersion does not hold, which in turn means that (while the parameters are still consistently estimated) the estimator is inefficient. To account for this problem, we apply Negbin regression models, more specific Negbin II models, if the related Likelihood Ratio tests reveal statistical hints for unobserved heterogeneity. In case that we are not able to reject the null hypothesis of no unobserved heterogeneity we use Poisson regression models.[40]

Nonetheless, as these results only provide a general look on pro-environmental and pro-social behavior, we additionally make use of multivariate ordered probit and bivariate binary probit models in order to compare the estimated parameters for the main explanatory variables across different fields of behavior. Hence, our empirical strategy is (partly) similar compared to the approach by Videras et al. (2012) who also consider several types of behaviors, whereas we apply more sophisticated discrete response models. Thereby we take both the ordinal (binary) scale of the dependent variables, but also the correlation of the error terms of the underlying latent variables into account (e.g., Greene, 2012). For example, Ziegler (2013) uses bivariate probit

[40] In this context, we mention that we are aware of the problem that applying a Poisson model with robust standard errors could be preferable as Negbin models are not even consistent if the underlying distribution assumptions do not hold.

models when considering determinants of process and product innovations simultaneously in order to avoid biased and inconsistent parameter estimates. We derive parameter estimates by using the Stata command 'cmp' published by Roodman (2011), which uses the simulated maximum likelihood (SML) method for parameter estimations in multivariate binary probit models. This estimator is consistent if both the number of draws and the number of observations go to infinity. In application, users can set the number of draws of replication of the implemented 'Geweke-Hajivassiliou-Keane smooth recursive conditioning simulator' themselves. Hereby, we consider simulation results of Cappellari and Jenkins (2003) in case of multivariate probit models, showing that number of draws should at least be equal to the square root of the sample size. Consequently, we see that the default value of 50 draws is appropriate.

5.4 Econometric results

5.4.1 Estimation results for aggregate measures

The parameter estimates in the different count data and bivariate probit models are reported in Table 32 and Table 33. For all count data models, we conducted likelihood ratio tests on unobserved heterogeneity, and thus overdispersion. The results reveal that overdispersion is obviously present in case of the first, third, and fourth models in Table 32 and Table 33, but not in the second models. Thus, we present the estimation results for Negbin II regression models in column 1, 3, and 4 in both tables, and parameter estimates in Poisson regression models for the second model in each table.

The ML estimates in Table 32 reveal significant positives effects of Catholics and Protestants on both the 'Eco activity index' and the 'Eco index', but also on the probability to consider ecological criteria in investment decisions. Hence, financial decisions makers with a Catholic or Protestant affiliation significantly more often state to strongly consider ecological criteria with respect to the activities summarized under the 'Eco activity index' than non-adherent persons. However, we find no significant effects of these variables in case of purchase decisions, and thus the significant positive effects with respect to the 'Eco index' are obviously driven by the activities captured by the 'Eco activity index'. Both indices are also significantly positively influenced by the share of Catholics and Protestants in the region a financial decision maker lives in. This means, independently of their own religious affiliation, that an increasing regional share

of Catholics (or Protestants) relatively to the share of non-adherents is significantly positively related to the persons' number of (stated) pro-environmental activities. Hence, for these activities, but not for purchase decisions, we find empirical support for the stewardship hypothesis (hypotheses 1c and 1d). We also find support for hypothesis H1e as both Catholics and Protestants are significantly more likely to consider ecological criteria in investment decisions than person with no religious affiliation. Though we find no regional effect here. These findings are supported by the results presented in Table 33, which differ only with respect to the measure for individual religion as we include 'Religiously active C+P' instead of the individual confession here.[41] The estimated parameters for this variable are highly significant across all models (also for model 2 now) indicating that religious Christians tend to consider ecological criteria more often than non-religious people. Now, there is even a positive parameter for 'Share of Protestants' in case of pro-ecological purchases. Hence, in summary we find empirical hints for the stewardship hypothesis.

Further, we find strong support for the hypotheses 2a and 2c, because supporters of both the Left Party and the Green Party significantly more often state to strongly consider ecological criteria with respect to activities, but also purchase and investment decisions than financial decision makers that prefer conservative parties. We find no significant differences between persons preferring the SPD versus supporters of the conservative parties for the model specifications presented in Table 32, i.e. when we include the variables for individual religious affiliation. However, for those specifications which include 'Religiously active C+P' instead we find weakly significant positive parameters for 'SPD' (see Table 33). Hence, in line with Dastrup et al. (2012) or Costa and Kahn (2013), we find a positive relationship between individual political left-wing orientation and pro-environmental behavior. Additionally, we find at least weak support for additional regional effects, as we find significant effects of 'Left Party share' and 'Green Party share' on the 'Eco index', and particularly persons living in regions with a larger share of Green Party supporters are more likely to consider ecological criteria in their investment decisions, which confirms hypothesis 2d. However, we also find highly significant negative effects of 'Share of SPD' on the consideration of ecological criteria in purchase decisions, which contradicts hypothesis 2b, and is as surprising as the result by Hood et al. (2014) who show that

[41] Note that we have to drop about 100 observations as several persons did not answer the question on how many times they actively pursue their religion per week.

investors from Democratic tilt counties are less likely to invest in stocks with environmental strengths.

Regarding the relationship between religion and pro-social behavior, we find no significant parameters for any model specification that comprises measures for individual and regional religious confessions (see Table 32). However, 'Religiously active C+P' is again highly significant and positively related to the 'Social purchases index' and 'Dummy: Social invest'. Hence, in line with Andorfer (2013), we see that religious persons tend to more strongly consider social criteria in purchase decisions, which supports hypothesis 3a. Further, our findings suggest that this also holds for investment decisions confirming hypothesis 3c, as previously shown by Hood et al. (2014) for stock holdings of individual investors from the USA. However, we do not find any significant regional effects and thus no support for the hypotheses 3b and 3d.

In case of pro-social purchase behavior, we see that Left Party and Green Party supporters consider social criteria in significantly more consumption fields than persons that prefer conservative parties, which confirms hypothesis 4a. We find the same patterns when we include 'Religiously active C+P' instead, but now we also find significantly positive parameters for 'SPD' (though only at the 10% significance level). In line with hypothesis 4c, Left Party supporters are also more likely so consider social criteria in investment decisions. Generally, we find rather support for a positive relationship between individual left-wing political orientation and pro-social behavior than regional effects. Regional effects are only revealed for 'Green Party shares' in case of investment decisions. This finding, however, is interesting, as investment decisions have a low degree of observability and thus cannot be easily imitated by others. Thus word-of-mouth communication is one potential explanation for this effect, as suggested by Hong et al. (2004) in context of sociability, which might enhance pro-social investment behavior in these regions.

Besides the effects of the main variables, we find highly significant estimates for 'Voluntarily active' and 'Environmental organization'. These findings are in line with previous studies, and might indicate either that these people express their pro-social or pro-environmental identity by making purchase or investment decisions in line with their personal views. It could also be another indicator for the word-of-mouth communication channel. Lastly, due to brevity reasons we decided to drop the estimation results for the remaining control variables from the output as

their influence seems to be of minor importance. We only find a significant negative effect for female on 'Dummy: Eco invest' in Table 32 (at the 10% significance level). With respect to the models shown in Table 33, age has a significant positive effect on 'Eco purchases index' (10%), female a negative effect on 'Dummy: Social invest' (10%), and 'University degree' a negative effect on 'Eco purchases index' and 'Social purchases' (5%).

5.4.2 Comparison across different behaviors

In order to examine which consumption fields or activities drive the aforementioned aggregate measures, we now consider the disaggregated behaviors. Based on SML estimates in multivariate ordered probit models, Table 34 through to Table 36 report estimated average marginal (in case of all continuous variables) and discrete (for all dummy variables) probability effects for the main explanatory variables with respect to the different behaviors. Therefore, each table has the same structure: By way of example, the first column in the upper part of Table 34 shows the estimated average marginal and discrete effects on the estimated probability that a person rather strongly considers ecological criteria when purchasing electronic devices, i.e. that the variable takes the value four.[42] The other columns analogously refer to 'Eco clothes', 'Eco car', 'Eco food', or 'Eco invest'. The lower part of this table refers to the average estimated probability that the respective variable takes the value five. Table 35 and Table 36 are constructed and to be interpreted in the same manner.

Table 34 shows that, as before, there is no significant relationship between having a Catholic or Protestant affiliation and the consideration of ecological criteria in purchase decisions, but obviously in case of investment decisions. The estimated average probability that a person rather strongly considers ecological criteria in investment decisions is five (eight) percentage points larger if the person is Catholic (Protestant) compared to a person with no religious affiliation (significant at the 10% significance level). Both results support hypothesis 1e. However, hypothesis 1c is supported by significant and positive discrete probability effects for 'Religiously active C+P', which range between three and six percentage points in case of category four (three and seven percentage points for category five). Further, we find significant positive marginal

[42] For reasons of brevity and redundancy, we do not report the parameter estimates of the underlying models nor the estimated probability effects for the categories one, two, or three. The estimates are available on request. The highly significant and positively estimated correlations coefficients of the error terms of the underlying latent variables reveal that it is very appropriate to use multivariate models instead of estimating each equation separately.

effects of the share of Catholics on the estimated probability to rather as well as very strongly consider ecological criteria when purchasing clothes or food, and also when making investment decisions. This also holds for 'Share of Protestants', except for the probability that 'Eco invest' takes the value five. Interestingly, the estimated marginal probability effects for Protestants regions tend to be around 0.1 percentage points larger compared to the regional effects of Catholic religion. Further, except for 'Eco invest', we observe that the estimated marginal effects for Protestant regions are larger than those for Catholic regions. Additionally, Table 35 reveals statistically strong positive estimates of religious affiliation, but also 'Religiously active' on all activities and behaviors, i.e. strong support for hypothesis 1c. Regional religion is particularly important in case of travel behavior (i.e. 'Freq. travel', 'Freq. flights', and 'Choice destinations'), but also positively related to the frequency of meat and dairy product consumption. The latter result is in line with those for 'Eco food' reported in Table 34. In sum, we find strong support for the stewardship hypothesis in almost all fields of consumption and activities, which is rather in line with Martin and Bateman (2014) or Axsen et al. (2012).

With respect to the impact of political orientation on pro-ecological purchase behavior, we find significant positive discrete probability effects for 'SPD' when we include 'Religiously active'. Further positive effects in line with hypothesis 2a can be found for 'Left Party' on purchase decisions with respect to electronic devices, clothes (only on category four), and food (on both categories). The estimated effects for 'Green Party' are even stronger in terms of significance, but also nearly twice as much as, for example, in case of food. This is comparable with the results made by Costa and Kahn (2013) who find that left-party voters generally consume less energy, but Green Party voters even less than Democrats. Apart from these individual effects, we find regional effects for the Left Party in case of clothes, food, and investments. This also holds for 'Green Party shares', except for purchase decisions in context of clothes. Contrarily, we now see that the negative results for 'SPD share' in Table 32 and Table 33 are mainly driven by negative effects on clothes, car, and food, which severely contradict hypothesis 2b. Thus, we observe negative effects across very different consumption fields in terms of observability and degree of irreversibility (for example, car versus food). The negative effects on pro-ecological food consumption are further underlined by the robust negative effects on the frequency of meat and milk consumption (see Table 35).

We finally focus on the in-depth analysis of pro-social behavior in Table 36. In contrast to the results with respect to the aggregated 'Social purchases index', these results support hypotheses 3a and 3c, i.e. religious persons are more likely to consider social aspects in purchase and investment decisions than non-religious persons. Religious affiliation seems to be less important. However, Protestants are more likely to consider rather or very strongly social/ethical criteria in investment decisions, while there is no significant effect for Catholics. Further, we find significant regional effects for Catholics and Protestants with respect to purchases of cars and food (for both categories), while the marginal probability effects for Protestant regions seem to be larger than those for Catholics. However, in contrast with former studies (e.g. Salaber, 2013; Hood et al., 2014; Kumar and Page, 2014), we find no regional effects for 'Social invest', i.e. no support for hypothesis 3d.

With respect to political orientation, 'SPD' is again only positively significant when we include the measure for religiously activity. Left Party supporters are significantly more likely to rather strongly consider social criteria in all listed purchase decisions, but also in investment decisions. This also applies for the fifth category in case of electronic devices and food. We also find positive effects of 'Green Party' for all purchase behaviors, and also investment decisions (category four), which at least holds for all fields except cars in case of the fifth category. Hence, the degree of observability and irreversibility seems to be less important. The only variable that does not support the hypotheses is 'SPD share', which again significantly negatively affects the consideration of social criteria when purchasing electronic devices, cars, and food. This shows that it is appropriate to distinguish between different parties, at least in the context of the German party system.

5.4.3 Robustness checks

Additional to the above mentioned different model specifications and dependent variables, we further considered several different model specifications and conducted a wide range of robustness checks. First, instead of using multivariate ordered probit models, we applied univariate ordered probit models, but also multivariate and univariate binary probit models. Corresponding (test) statistics clearly underline the superiority of multivariate models. Further, if we would consider binary dependent variables instead, which could be similarly defined as in case of 'Dummy: Eco invest' and 'Dummy: Social invest', we would lose important information,

and the results severely depend on the base group, i.e. particularly how we handle the middle group (category three). We further considered different specifications of the independent variables on the basis of previous studies. With respect to the measurement of religion, we included a count variable capturing the number of days per week a person attends its religion instead of the corresponding dummy variables that we used in the main analysis. However, the results were qualitatively similar and other independent variables remained robust. The same applied when we included a dummy variable that takes the value one if the share of Catholics in a region exceeds the share of Protestants. In this context, we also included a variable that measured the ratio of Catholics to Protestants in a region as used by Kumar et al. (2011). Finally, we used similar specifications with respect to political orientation, and, for example, included a dummy variable that takes the value one if the regional share of left-wing parties is larger than 0.5. However, the estimation results based on these changes revealed no further information than the results reported in the main analysis. Regarding sociability, we considered two further variables in the robustness checks. First, we included a variable capturing the self-stated hours a respondent is engaged in voluntarily activities per month. Hence, similar to the measurement of individual religiosity we also tried to measure the degree of sociability by measuring how often a person attends this kind of activity. However, the results revealed no further information and we excluded it due to multicollinearity issues. We also considered different variable combinations, definitions (for example, a secondary education instead of 'University degree'), or just additional control variables (for example, a variable capturing individual wealth). Anyway, the main results remain stable in all considered specifications. Finally, in order to analyze the unexpected negative relationship between 'SPD share' and several sustainable behaviors more deeply, we additionally controlled for the population size in each district as (admittedly rough) proxy for urban areas, which was further not congruent with the zip code areas. However, the estimation results remained robust. Due to a lack of availability of further data, such as regional income or rural versus urban areas, we were not able to test for further underlying effects.

5.5 Conclusion and discussion

This paper empirically analyzes the relationship between Christian religion, religiosity, and political orientation and various sustainable behaviors, especially investment decisions, of

financial decisions makers in German households, i.e. important actors of the largest economy in Europe. The empirical analysis is based on data from a broad (online) representative survey, which are combined with information on regional political orientations and proportions of religious affiliations. Hence, to the best of our knowledge, we are the first considering not only these two factors in one empirical analysis, but also both the individual and regional dimension. Thereby, we contribute to the literature on sustainable behavior, especially SRI, but also on the role of social identity and categories for individual behavior in general. Thus, we help to close several research gaps, as only very few studies analyze the relationship between religion (and political orientation) and individual pro-environmental investment decisions, or between political orientation and pro-social behaviors in general.

The core results indicate that Catholic or Protestant religion and religiosity as well as a political left-wing or green party orientation are positively related to several sustainable behaviors, for example, pro-environmental or pro-social purchases of food, clothes, cars, or in investment decisions. Hence, persons express their religious or political identity through sustainable behaviors. This implies that these factors positively affect different behaviors independently of their degree of observability or importance in terms of irreversibility. This further indicates that religious values are also important in a country like Germany, where in contrast to the USA the number of members of Christian churches have decreased over the last decades.

Our findings can be used for targeted information campaigns for enhancing individuals' sustainable behaviors by, for example, making their religion or political orientation more salient to them. Particularly, this also allows policy makers to directly address certain regions to enhance sustainable behaviors of persons living in these areas. Hence, these results are important from a practical perspective as it is simple to identify religious and non-religious regions. This is particularly interesting, as our empirical findings imply that regional religion or political orientation are related to sustainable behaviors of persons living in these areas even if they have different political views or are adherents of another (or no) religion. However, as it would be beyond the scope of this study, we do not consider the potential interaction effects between regional and individual religion or political orientation. However, this might be a promising path for future research as for example supporters of the Christian Democratic Party in Germany

might share both conservative views, which is obviously negatively associated with sustainable behavior, but might also try to live in conformity with Christian values.

However, we also find unexpected results, i.e. the negative relationship between the share of votes for the SPD and pro-environmental purchase decisions. Hood et al. (2014)'s empirical analysis reveals a similar negative relationship as investors from Democratic counties in the USA are less likely to invest in a pro-environmentally manner. Yet, we have no explanation for this finding. Unfortunately, due to data limitations, we were only able to control for the population size in the administrative district. However, it could be possible that these regional variables are contaminated by other underlying regional factors. Hence, it would be interesting to consider other variables, such as regional income or whether the persons live in a rural or urban regions. The last point might be interesting for at least two reasons: First, this should be important in terms of transport or travel behavior, as people from rural areas rely more heavily on having an own car whilst having less opportunities to use public transport modes. Further, Social Democrats are particularly strongly represented in large German cities. Second, it could also be caused by crowding-out effects as persons living in these areas expect the local government to support a sustainable development. We leave this question open for future research.

With respect to the measurement of individual political orientation, it is further interesting to analyze whether our results hold, when we consider different measures for political orientation as for example proposed by Ziegler (2015) who considers questions on general political directions, such as a conservative, social, green, or liberal orientation. This approach could be promising particularly in Germany, as it allows to combine and compare several political orientations, such as conservative-green versus social-liberal persons. Additionally, one could also focus more deeply on the role of other relevant persons in the social context by, for example, including measures that capture the regional degree of sociability. The number of members of clubs in a certain region would be conceivable in this context.

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Appendix A: Tables

Table 1: Frequencies of SRI shares among all investments for the 1001 respondents

SRI shares	0%	More than 0% to 20%	More than 20% to 40%	More than 40% to 60%	More than 60% to 80%	More than 80% to less than 100%	100%	Total
Frequencies	794 (79.32%)	55 (5.49%)	59 (5.89%)	48 (4.80%)	29 (2.90%)	16 (1.60%)	0 (0%)	1001 (100%)

Table 2: Descriptive statistics of explanatory variables

Variables	Number of observations	Mean
Higher perceived returns SRI	752	0.06
Higher perceived fees SRI	743	0.36
Higher perceived risk SRI	782	0.35
Female	1001	0.49
Age	1001	43.91
High education	997	0.62
Living together or married	995	0.67
Western Germany	1001	0.82
Warm glow	938	0.46
No contribution social environment	836	0.41
Expectation social environment	955	0.10
Expectation society	952	0.14
Membership environmental organization	942	0.10
Catholic affiliation	901	0.26
Protestant affiliation	901	0.30
Affiliation other religious groups	901	0.04
Christian religiosity	729	0.23
Affinity left-wing parties	778	0.49

Table 3: ML estimates (robust z-statistics) in ordered probit models, dependent variables: Share of SRI among all investments

Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Higher perceived returns SRI	0.52** (2.34)	0.40 (1.64)	0.57** (2.51)	0.58** (2.34)	0.46* (1.68)	0.38 (1.32)	0.32 (1.12)
Higher perceived fees SRI	-0.36*** (-3.29)	-0.31** (-2.52)	-0.35*** (-2.92)	-0.39*** (-2.97)	-0.41*** (-3.39)	-0.37** (-2.53)	-0.29* (-1.84)
Higher perceived risk SRI	-0.39*** (-3.47)	-0.27** (-2.07)	-0.42*** (-3.42)	-0.30** (-2.25)	-0.38*** (-3.05)	-0.29* (-1.93)	-0.16 (-0.99)
Female	-0.02 (-0.16)	-0.02 (-0.21)	-0.06 (-0.52)	-0.01 (-0.08)	-0.03 (-0.26)	-0.08 (-0.62)	-0.15 (-1.03)
Age	-0.00 (-0.62)	0.00 (0.02)	-0.00 (-0.60)	-0.00 (-0.81)	-0.01 (-1.51)	-0.00 (-0.33)	-0.00 (-0.57)
High education	0.05 (0.40)	0.03 (0.24)	0.02 (0.20)	0.15 (1.04)	0.06 (0.45)	0.02 (0.12)	0.19 (1.09)
Living together or married	0.15 (1.33)	0.22* (1.71)	0.13 (1.06)	0.07 (0.54)	0.13 (1.08)	0.28** (1.97)	0.18 (1.20)
Western Germany	0.14 (1.02)	0.19 (1.14)	0.13 (0.82)	0.13 (0.77)	0.20 (1.29)	0.35* (1.74)	0.42** (2.12)
Warm glow	--	0.59*** (4.77)	--	--	--	0.64*** (4.51)	0.58*** (3.66)
No contribution social environment	--	-0.30*** (-2.60)	--	--	--	-0.28** (-2.12)	-0.32** (-2.20)
Expectation social environment	--	0.72*** (4.40)	--	--	--	0.71*** (4.06)	0.64*** (3.36)
Expectation society	--	0.29* (1.92)	--	--	--	0.40** (2.41)	0.33* (1.73)
Membership environmental organization	--	0.41*** (2.64)	--	--	--	0.44** (2.47)	0.55*** (2.84)
Catholic affiliation	--	--	0.34** (2.54)	--	--	0.20 (1.22)	--
Protestant affiliation	--	--	0.10 (0.73)	--	--	-0.01 (-0.04)	--
Affiliation other religious groups	--	--	0.56* (1.65)	0.59* (1.80)	--	0.50 (1.42)	0.50 (1.49)
Christian religiosity	--	--	--	0.46*** (3.53)	--	--	0.16 (0.97)
Affinity left-wing parties	--	--	--	--	-0.14 (-1.22)	-0.30** (-2.12)	-0.18 (-1.15)
Number of observations	697	582	631	510	573	474	390

Note: * (**, ***) means that the appropriate parameter is different from zero at the 10% (5%, 1%) significance level, respectively.

Table 4: ML estimates (robust z-statistics) in binary probit models, dependent variables: Shares of SRI among all investments greater than zero

Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Higher perceived returns SRI	0.44** (1.98)	0.25 (1.04)	0.51** (2.25)	0.51** (2.07)	0.31 (1.17)	0.21 (0.75)	0.20 (0.66)
Higher perceived fees SRI	-0.31*** (-2.65)	-0.25* (-1.92)	-0.29** (-2.31)	-0.32** (-2.29)	-0.35*** (-2.69)	-0.29* (-1.85)	-0.21 (-1.21)
Higher perceived risk SRI	-0.37*** (-3.10)	-0.26* (-1.88)	-0.43*** (-3.26)	-0.32** (-2.21)	-0.36*** (-2.72)	-0.31* (-1.92)	-0.19 (-1.08)
Female	-0.04 (-0.35)	-0.02 (-0.16)	-0.04 (-0.38)	-0.01 (-0.11)	-0.04 (-0.33)	-0.01 (-0.07)	-0.08 (-0.51)
Age	-0.00 (-0.36)	0.00 (0.32)	-0.00 (-0.37)	-0.00 (-0.72)	-0.00 (-1.06)	0.00 (0.17)	-0.00 (-0.13)
High education	0.07 (0.61)	0.09 (0.66)	0.04 (0.32)	0.19 (1.31)	0.10 (0.79)	0.08 (0.54)	0.27 (1.56)
Living together or married	0.13 (1.15)	0.20 (1.45)	0.14 (1.12)	0.08 (0.60)	0.08 (0.60)	0.26 (1.64)	0.17 (0.98)
Western Germany	0.14 (0.97)	0.20 (1.18)	0.13 (0.77)	0.13 (0.75)	0.20 (1.25)	0.31 (1.45)	0.42** (2.03)
Warm glow	--	0.55*** (4.12)	--	--	--	0.58*** (3.84)	0.55*** (3.22)
No contribution social environment	--	-0.32** (-2.58)	--	--	--	-0.29** (-2.07)	-0.30** (-1.97)
Expectation social environment	--	0.75*** (4.07)	--	--	--	0.79*** (3.93)	0.78*** (3.60)
Expectation society	--	0.20 (1.20)	--	--	--	0.33* (1.76)	0.31 (1.47)
Membership environmental organization	--	0.43** (2.49)	--	--	--	0.47** (2.34)	0.57*** (2.58)
Catholic affiliation	--	--	0.32** (2.20)	--	--	0.18 (0.99)	--
Protestant affiliation	--	--	0.02 (0.13)	--	--	-0.11 (-0.62)	--
Affiliation other religious groups	--	--	0.27 (0.86)	0.30 (1.01)	--	0.16 (0.47)	0.15 (0.46)
Christian religiosity	--	--	--	0.41*** (2.91)	--	--	0.08 (0.44)
Affinity left-wing parties	--	--	--	--	-0.19 (-1.63)	-0.35** (-2.33)	-0.25 (-1.52)
Constant	-0.65** (-2.43)	-1.32*** (-3.85)	-0.76*** (-2.58)	-0.79** (-2.47)	-0.42 (-1.41)	-1.39*** (-3.49)	-1.52*** (-3.53)
Number of observations	697	582	631	510	573	474	390

Table 5: ML estimates (robust z-statistics) in ordered and binary probit models, dependent variables: Share of SRI among all investments or shares of SRI among all investments greater than zero, robustness checks

	Ordered probit models				Binary probit models	
Explanatory variables	Alternative dependent variable	Alternative dependent variable	Inclusion of missing values	Inclusion of missing values	Inclusion of missing values	Inclusion of missing values
Higher perceived returns SRI	0.40 (1.38)	0.32 (1.14)	--	--	--	--
Higher perceived returns SRI with missing values	--	--	0.51** (2.18)	0.44* (1.77)	0.36 (1.53)	0.30 (1.16)
Missing values perceived returns SRI	--	--	-0.09 (-0.37)	-0.32 (-1.06)	-0.10 (-0.41)	-0.38 (-1.21)
Higher perceived fees SRI	-0.38*** (-2.73)	-0.30* (-1.93)	--	--	--	--
Higher perceived fees SRI with missing values	--	--	-0.34** (-2.57)	-0.29** (-1.96)	-0.28** (-1.98)	-0.22 (-1.39)
Missing values perceived fees SRI	--	--	-0.54** (-2.12)	-0.29 (-1.16)	-0.49* (-1.79)	-0.21 (-0.79)
Higher perceived risk SRI	-0.29** (-1.98)	-0.16 (-1.02)	--	--	--	--
Higher perceived risk SRI with missing values	--	--	-0.32** (-2.39)	-0.24 (-1.64)	-0.33** (-2.29)	-0.26 (-1.63)
Missing values perceived risk SRI	--	--	0.07 (0.22)	0.21 (0.56)	0.07 (0.21)	0.26 (0.73)
Female	-0.09 (-0.71)	-0.16 (-1.13)	-0.04 (-0.62)	-0.07 (-0.57)	0.00 (0.01)	-0.04 (-0.30)
Age	-0.00 (-0.36)	-0.00 (-0.59)	-0.00 (-0.39)	-0.00 (-0.04)	0.00 (0.84)	0.00 (0.19)
High education	0.02 (0.16)	0.19 (1.12)	-0.08 (-0.69)	0.04 (0.30)	-0.05 (-0.39)	0.10 (0.70)
Living together or married	0.32** (2.34)	0.22 (1.48)	0.16 (1.31)	0.08 (0.64)	0.17 (1.29)	0.09 (0.62)
Western Germany	0.33 (1.62)	0.39* (1.93)	0.17 (1.00)	0.19 (1.12)	0.15 (0.82)	0.19 (1.08)
Warm glow	0.65*** (4.63)	0.59*** (3.76)	0.66*** (5.47)	0.61*** (4.54)	0.63*** (4.88)	0.61*** (4.21)
No contribution social environment	-0.28** (-2.14)	-0.33** (-2.33)	-0.34*** (-2.98)	-0.37*** (-2.95)	-0.36*** (-3.08)	-0.38*** (-2.96)
Expectation social environment	0.64*** (3.86)	0.58*** (3.15)	0.72*** (4.55)	0.62*** (4.54)	0.75*** (4.25)	0.70*** (3.62)
Expectation society	0.39** (2.45)	0.32* (1.74)	0.33** (2.19)	0.28* (1.69)	0.21 (1.29)	0.20 (1.14)
Membership environmental organization	0.41** (2.37)	0.54*** (2.80)	0.37** (2.40)	0.47*** (2.75)	0.39** (2.25)	0.46** (2.42)
Catholic affiliation	0.22 (1.31)	--	0.13 (0.90)	--	0.13 (0.84)	--
Protestant affiliation	0.01 (0.05)	--	0.08 (0.54)	--	0.02 (0.10)	--
Affiliation other religious groups	0.37 (1.19)	0.39 (1.29)	0.53* (1.89)	0.50* (1.86)	0.26 (0.94)	0.22 (0.83)
Christian religiosity	--	0.16 (0.98)	--	0.13 (0.97)	--	0.09 (0.63)
Affinity left-wing parties	-0.26* (-1.83)	-0.13 (-0.87)	--	--	--	--
Affinity left-wing parties with missing values	--	--	-0.41*** (-3.13)	-0.27* (-1.94)	-0.46*** (-3.38)	-0.33** (-2.27)
Missing values party affinity	--	--	-0.20 (-1.14)	-0.16 (-0.78)	-0.20 (-1.09)	-0.22 (-1.06)
Number of observations	474	390	720	588	720	588

Note: * (**, ***) means that the appropriate parameter is different from zero at the 10% (5%, 1%) significance level, respectively.

Table 6: Estimates (robust z-statistics) of average discrete and marginal (for "age") probability effects in ordered and binary probit models, only inclusion of variables for perceived financial performance of SRI and control variables

Explanatory variables	Ordered probit model			Binary probit model
	Category 1	Category 2	Category 5	
Higher perceived returns SRI	-0.18** (-2.17)	0.02*** (3.12)	0.08* (1.74)	0.15* (1.85)
Higher perceived fees SRI	0.11*** (3.42)	-0.02*** (-3.00)	-0.04*** (-3.32)	-0.09*** (-2.75)
Higher perceived risk SRI	0.11*** (3.65)	-0.02*** (-3.01)	-0.04*** (-3.48)	-0.11*** (-3.27)
Female	n.s.	n.s.	n.s.	n.s.
Age	n.s.	n.s.	n.s.	n.s.
High education	n.s.	n.s.	n.s.	n.s.
Living together or married	n.s.	n.s.	n.s.	n.s.
Western Germany	n.s.	n.s.	n.s.	n.s.
Number of observations		697		697

Notes: * (**, ***) means that the appropriate effect is different from zero at the 10% (5%, 1%) significance level, respectively; n.s. means that the appropriate effect is not significant.

Table 7: Estimates (robust z-statistics) of average discrete and marginal (for "age") probability effects in ordered and binary probit models, full model specifications without missing values

	Ordered probit models						Binary probit models	
Explanatory variables	Cate-gory 1	Cate-gory 2	Cate-gory 5	Cate-gory 1	Cate-gory 2	Cate-gory 5		
Higher perceived returns SRI	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Higher perceived fees SRI	0.09*** (2.60)	-0.01** (-2.31)	-0.03*** (-2.60)	0.07* (1.88)	-0.01* (-1.74)	-0.02* (-1.91)	-0.07* (-1.90)	
Higher perceived risk SRI	0.07** (1.97)	-0.01* (-1.73)	-0.03** (-2.03)	0.04 (1.00)	-0.01 (-0.95)	-0.01 (-1.02)	-0.08** (-1.97)	-0.05 (-1.09)
Female	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Age	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
High education	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Living together or married	-0.07** (-2.02)	0.01* (1.87)	0.02** (2.00)	n.s.	n.s.	n.s.	0.07* (1.69)	n.s.
Western Germany	-0.08* (-1.87)	n.s.	0.03** (1.99)	-0.10** (-2.30)	0.02* (1.93)	0.03** (2.40)	n.s.	0.10** (2.21)
Warm glow	-0.17*** (-4.58)	0.03*** (3.49)	0.05*** (4.09)	-0.15*** (-3.73)	0.03*** (2.99)	0.05*** (3.47)	0.15*** (3.90)	0.15*** (3.27)
No contribution social environment	0.07** (2.14)	-0.01** (-1.97)	-0.03** (-2.18)	0.08** (2.24)	-0.01** (-2.01)	-0.03** (-2.25)	-0.07** (-2.09)	-0.08** (-1.98)
Expectation social environment	-0.21*** (-3.65)	0.02*** (3.47)	0.09*** (3.05)	-0.19*** (-3.04)	0.02*** (2.99)	0.08*** (2.60)	0.24*** (3.55)	0.24*** (3.27)
Expectation society	-0.11** (-2.25)	0.01** (2.37)	0.04** (2.12)	n.s.	0.01* (1.74)	n.s.	0.09* (1.65)	n.s.
Membership environmental organization	-0.12** (-2.32)	0.01** (2.51)	0.05** (2.09)	-0.16*** (-2.63)	0.02*** (2.82)	0.06** (2.26)	0.13** (2.18)	0.17** (2.37)
Catholic affiliation	n.s.	n.s.	n.s.	--	--	--	n.s.	--
Protestant affiliation	n.s.	n.s.	n.s.	--	--	--	n.s.	--
Affiliation other religious groups	n.s.	0.01* (1.77)	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Christian religiosity	--	--	--	n.s.	n.s.	n.s.	--	n.s.
Affinity left-wing parties	0.08** (2.15)	-0.01* (-1.95)	-0.03** (-2.11)	n.s.	n.s.	n.s.	-0.09** (-2.36)	n.s.
Number of observations		474			390		474	390

Notes: * (**, ***) means that the appropriate effect is different from zero at the 10% (5%, 1%) significance level, respectively; n.s. means that the appropriate effect is not significant.

Table 8: Estimates (robust z-statistics) of average discrete and marginal (for "age") probability effects in ordered and binary probit models, full model specifications including missing values

	Ordered probit models						Binary probit models	
Explanatory variables	Cate-gory 1	Cate-gory 2	Cate-gory 5	Cate-gory 1	Cate-gory 2	Cate-gory 5		
Higher perceived returns SRI with missing values	-0.12** (-2.19)	0.02** (2.12)	0.04** (2.03)	-0.10* (-1.77)	0.02* (1.74)	0.04* (1.66)	n.s.	n.s.
Missing values perceived returns SRI	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Higher perceived fees SRI with missing values	0.08*** (2.59)	-0.01** (-2.48)	-0.03** (-2.42)	0.07** (1.98)	-0.01* (-1.95)	-0.02* (-1.90)	-0.07** (-1.99)	n.s.
Missing values perceived fees SRI	0.12** (2.14)	-0.02** (-2.10)	-0.04** (-2.03)	n.s.	n.s.	n.s.	-0.11* (-1.81)	n.s.
Higher perceived risk SRI with missing values	0.07** (2.38)	-0.01** (-2.26)	-0.03** (-2.28)	n.s.	n.s.	n.s.	-0.08** (-2.28)	n.s.
Missing values perceived fees SRI	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Female	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Age	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
High education	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Living together or married	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Western Germany	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Warm glow	-0.16*** (-5.36)	0.03*** (4.21)	0.05*** (4.61)	-0.15*** (-4.46)	0.03*** (3.57)	0.04*** (3.94)	0.16*** (4.78)	0.15*** (4.12)
No contribution social environment	0.08*** (3.03)	-0.01*** (-2.67)	-0.03*** (-3.04)	0.08*** (3.00)	-0.02*** (-2.59)	-0.03*** (-2.94)	-0.08*** (-3.13)	-0.09*** (-3.00)
Expectation social environment	-0.20*** (-3.96)	0.03*** (3.91)	0.08*** (3.37)	-0.17*** (-3.15)	0.03*** (3.14)	0.07*** (2.77)	0.22*** (3.72)	0.20*** (3.17)
Expectation society	-0.08** (-2.03)	0.01** (2.12)	0.03* (1.92)	n.s.	0.01* (1.66)	n.s.	n.s.	n.s.
Membership environmental organization	-0.09** (-2.22)	0.01** (2.36)	0.04** (2.02)	-0.13** (-2.50)	0.02*** (2.65)	0.05** (2.21)	0.10** (2.07)	0.12** (2.20)
Catholic affiliation	n.s.	n.s.	n.s.	--	--	--	n.s.	--
Protestant affiliation	n.s.	n.s.	n.s.	--	--	--	n.s.	--
Affiliation other religious groups	-0.14* (-1.71)	0.02** (2.16)	n.s.	-0.12* (-1.88)	0.02* (1.87)	0.04* (1.82)	n.s.	n.s.
Christian religiosity	--	--	--	n.s.	n.s.	n.s.	--	n.s.
Affinity left-wing parties with missing values	0.10*** (3.21)	-0.02*** (-2.81)	-0.03*** (-3.03)	0.06** (1.96)	-0.01* (-1.83)	-0.02* (-1.89)	-0.11*** (-3.44)	-0.08** (-2.30)
Missing values party affinity	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Number of observations		720			588		720	588

Notes: * (**, ***) means that the appropriate effect is different from zero at the 10% (5%, 1%) significance level, respectively; n.s. means that the appropriate effect is not significant.

Table 9: Attributes and attribute levels in the SC experiments

First SC experiment on three-year fixed interest investment products	
Attributes	Attribute levels
Provider	Big bank, municipal savings bank, co-operative bank, direct bank, sustainability bank
Yearly nominal interest rate	1.30%, 1.50%, 1.70%, 1.90%, 2.10%
Sustainability criteria	No consideration, consideration without sustainability certificate, consideration with sustainability certificate
Transparency logo	No transparency logo, transparency logo issued by NGO, transparency logo issued by the state
Second SC experiment on equity funds	
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 yearly 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 NGO, transparency logo issued by the state

Table 10: Exemplary choice set for the first SC experiment on three-year fixed-interest rate investment products

Please indicate which of the following four investment products you would most likely purchase.				
Attribute	Three year fixed-interest rate investment product A	Three year fixed-interest rate investment product B	Three year fixed-interest rate investment product C	Three year fixed-interest rate investment product D
Provider	Direct bank	Direct bank	Big bank	Municipal savings bank
Yearly nominal interest	1.30%	1.70%	1.50%	1.30%
Sustainability criteria	No consideration	Consideration with certificate	Consideration without certificate	No consideration
Transparency logo	No transparency logo	Transparency logo issued by NGO	Transparency logo issued by the state	No transparency logo
	□	□	□	□

Table 11: Exemplary choice set for the second SC experiment on equity funds

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 yearly net returns in the last five years	3.00%	7.00%	5.00%	9.00%
Sustainability criteria	Consideration without certificate	No consideration	Consideration with certificate	No consideration
Transparency logo	Transparency logo issued by the state	No transparency logo	Transparency logo issued by NGO	Transparency logo issued by NGO
	□	□	□	□

Table 12: Descriptive statistics of individual characteristics

Social values and norms		
Variables	Number of observations	Mean
Warm glow	936	0.46
Expectation social environment	955	0.10
Membership environmental organization	942	0.10
Affinity left-wing parties	778	0.49
Socio-demographic and socio-economic variables		
Variables	Number of observations	Mean
Female	1001	0.49
Age	1001	43.91
Older respondent	1001	0.53
High education	997	0.62
Living together or married	995	0.67
Western Germany	1001	0.82

Table 13: SML estimation results in mixed logit models for the choice among four equity funds

Explanatory variables	Parameter estimates (robust z-statistics) Mean	Standard deviation	Mean	Standard deviation
Value of the subscription fee	-0.20*** (-8.25)	--	-0.21*** (-8.28)	--
Net return in the last year	0.20*** (14.40)	--	0.21*** (14.70)	--
Average yearly net return in the last five years	0.34*** (23.35)	--	0.36*** (23.30)	--
Consideration of sustainability criteria	0.85*** (16.38)	1.00*** (18.29)	--	--
Consideration of sustainability criteria without certificate	--	--	0.52*** (11.42)	-0.39*** (-4.07)
Consideration of sustainability criteria with certificate	--	--	0.99*** (16.13)	1.09*** (15.84)
Transparency logo	0.84*** (15.01)	0.96*** (15.57)	--	--
Transparency logo issued by NGO	--	--	0.62*** (11.77)	0.62*** (8.58)
Transparency logo issued by the state	--	--	0.82*** (13.94)	0.85*** (11.96)

	Mean WTP estimates Value of the subscription fee	Net return in the last year	Average yearly net return in the last five years	Value of the subscription fee	Net return in the last year	Average yearly net return in the last five years
Consideration of sustainability criteria	4.27	-4.36	-2.52	--	--	--
Consideration of sustainability criteria without certificate	--	--	--	2.45	-2.51	-1.45
Consideration of sustainability criteria with certificate	--	--	--	4.67	-4.78	-2.76
Transparency logo	4.22	-4.31	-2.49	--	--	--
Transparency logo issued by NGO	--	--	--	2.93	-3.00	-1.73
Transparency logo issued by the state	--	--	--	3.88	-3.97	-2.29

Note: For the SML estimation 1000 Halton draws were used. The basis of the estimation results in this table are data from the second SC experiment with N = 801 respondents, M = 8 choice sets, and thus 6408 observations. The upper part of the table reports for each explanatory variable the parameter estimates and the corresponding robust z-statistics in parentheses. * (**, ***) means that the appropriate parameter is different from zero at the 10% (5%, 1%) significance level, respectively. The lower part of the table reports for each combination of non-financial and financial performance variables the mean WTP estimates. The values are calculated by dividing the estimated mean of the random parameters of the non-financial performance variables by the estimated parameters of the financial performance variables. While the left side of the table refers to the model specification that includes the two aggregated dummy variables for sustainability criteria and transparency logo, the right side refers to the model specification that includes the corresponding disaggregated dummy variables, respectively.

Table 14: SML estimation results in mixed logit models for the choice among four three-year fixed-interest rate investment products

Explanatory variables	Parameter estimates (robust z-statistics)			
	Mean	Standard deviation	Mean	Standard deviation
Yearly nominal interest rate	3.97*** (26.17)	--	4.12*** (25.85)	--
Consideration of sustainability criteria	0.83*** (14.19)	1.07*** (14.46)	--	--
Consideration of sustainability criteria without certificate	--	--	0.46*** (8.25)	-0.04 (-0.13)
Consideration of sustainability criteria with certificate	--	--	1.02*** (14.36)	1.24*** (14.61)
Transparency logo	1.03*** (16.54)	1.05*** (12.88)	--	--
Transparency logo issued by NGO	--	--	0.77*** (13.42)	-0.33* (-1.84)
Transparency logo issued by the state	--	--	0.97*** (14.61)	0.84*** (10.59)
Municipal savings bank	0.49*** (6.55)	1.29*** (12.06)	0.46*** (6.02)	1.35*** (12.40)
Co-operative bank	0.50*** (7.05)	1.07*** (10.30)	0.50*** (6.84)	1.13*** (10.61)
Direct bank	0.11* (1.79)	0.51** (3.35)	0.11* (1.73)	0.46** (2.17)
Sustainability bank	0.22*** (2.82)	1.14*** (10.95)	0.20** (2.50)	1.33*** (12.50)
	Mean WTP estimates (on the basis of the yearly nominal interest rate)			
Consideration of sustainability criteria	-0.21		--	
Consideration of sustainability criteria without certificate	--		-0.11	
Consideration of sustainability criteria with certificate	--		-0.25	
Transparency logo	-0.26		--	
Transparency logo issued by NGO	--		-0.19	
Transparency logo issued by the state	--		-0.24	
Municipal savings bank	-0.12		-0.11	
Co-operative bank	-0.13		-0.12	
Direct bank	--		-0.03	
Sustainability bank	-0.05		-0.05	

Note: For the SML estimation 1000 Halton draws were used. The basis of the estimation results in this table are data from the first SC experiment with N = 1001 respondents, M = 6 choice sets, and thus 6006 observations. The upper part of the table reports for each explanatory variable the parameter estimates and the corresponding robust z-statistics in parentheses. * (**, ***) means that the appropriate parameter is different from zero at the 10% (5%, 1%) significance level, respectively. The lower part of the table reports the mean WTP estimates for each non-financial variable if the corresponding mean of the random parameters is significantly different from zero. The values are calculated by dividing the estimated mean of the random parameters of the non-financial variables by the estimated

parameters of the yearly nominal interest rates. While the left side of the table refers to the model specification that includes the two aggregated dummy variables for sustainability criteria and transparency logo, the right side refers to the model specification that includes the corresponding disaggregated dummy variables, respectively.

Table 15: SML estimation results in mixed logit models for the choice among four three-year fixed-interest rate investment products, robustness checks with aggregated variables for sustainability criteria and transparency logo

	Parameter estimates (robust z-statistics)					
Explanatory variables	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Yearly nominal interest rate	4.21*** (24.37)	--	4.52*** (17.03)	--	4.55*** (15.43)	--
Consideration of sustainability criteria	0.85*** (12.99)	1.07*** (12.91)	1.20*** (11.00)	1.32*** (9.20)	1.19*** (9.95)	1.33*** (8.60)
Transparency logo	1.04*** (15.10)	1.00*** (10.70)	1.25*** (11.54)	0.97*** (6.38)	1.22*** (10.61)	0.88*** (5.50)
Municipal savings bank	0.50*** (6.15)	1.27*** (10.94)	0.48*** (3.46)	1.72*** (9.38)	0.59*** (4.00)	1.72*** (9.16)
Co-operative bank	0.49*** (6.21)	1.03*** (8.33)	0.38*** (2.94)	1.50*** (7.39)	0.39*** (2.75)	1.43*** (7.00)
Direct bank	0.10 (1.54)	0.36 (1.50)	0.00 (0.00)	0.52* (0.31)	0.09 (0.73)	0.37 (0.78)
Sustainability bank	0.29*** (3.58)	1.23*** (9.99)	0.38*** (3.12)	0.98*** (4.87)	0.50*** (3.93)	0.89*** (4.45)
	Estimated average WTP (fixed yearly interest rate)					
Consideration of sustainability criteria	-0.20		-0.27		-0.26	
Transparency logo	-0.25		-0.28		-0.27	
Municipal savings bank	-0.12		-0.11		-0.13	
Co-operative bank	-0.12		-0.08		-0.09	
Direct bank	-		-		-	
Sustainability bank	-0.07		-0.08		-0.11	

Note: For all SML estimations 1000 Halton draws were used. The basis of the estimation results in this table are data from the first SC experiment with $M = 6$ choice sets and different numbers of respondents and thus observations. The upper part of the table reports for each explanatory variable the parameter estimates and the corresponding robust z-statistics in parentheses. * (**, ***) means that the appropriate parameter is different from zero at the 10% (5%, 1%) significance level, respectively. The lower part of the table reports the mean WTP estimates for each non-financial variable if the corresponding mean of the random parameters is significantly different from zero. The values are calculated by dividing the estimated mean of the random parameters of the non-financial variables by the estimated parameters of the yearly nominal interest rates. All model specifications include the two aggregated dummy variables for sustainability criteria and transparency logo. The left part of the table refers to estimations results that only include respondents who stated after the experiments that the description of the choice situations was understandable (N = 837). The middle part of the table refers to estimations results that only include participants who stated separately for each choice set they are rather or very sure that they would purchase the investment product in reality (possible response categories were "very unsure", "rather unsure", "neither sure nor unsure", "rather sure", and "very sure"). The right part of the table refers to estimations results that only include respondents who stated after the experiments both that the description of the choice situations was understandable and separately for each choice set that they are rather or very sure that they would purchase the investment product in reality.

Table 16: SML estimation results in mixed logit models for the choice among four three-year fixed-interest rate investment products, robustness checks with disaggregated variables for sustainability criteria and transparency logo

	Parameter estimates (robust z-statistics)					
Explanatory variables	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Yearly nominal interest rate	4.42***	--	4.83***	--	4.82***	--
	(23.55)		(15.91)		(13.02)	
Consideration of sustainability criteria without certificate	0.47***	-0.10	0.64***	-0.19	0.59***	-0.19
	(7.61)	(-0.33)	(6.38)	(-0.32)	(5.52)	(-0.11)
Consideration of sustainability criteria with certificate	1.06***	1.24***	1.48***	1.51***	1.45***	1.53***
	(13.28)	(13.34)	(10.99)	(9.74)	(9.32)	(8.04)
Transparency logo issued by NGO	0.80***	-0.38**	1.00***	-0.033	1.00***	0.01
	(12.61)	(-2.56)	(10.41)	(-0.07)	(9.20)	(0.18)
Transparency logo issued by the state	1.02***	0.82***	1.26***	0.82***	1.24***	0.70***
	(13.82)	(9.11)	(11.42)	(5.28)	(9.97)	(3.47)
Municipal savings bank	0.48***	1.33***	0.48***	1.82***	0.63***	1.74***
	(5.77)	(11.16)	(3.30)	(9.49)	(3.92)	(8.70)
Co-operative bank	0.48***	1.09***	0.43***	1.57***	0.44***	1.50***
	(5.93)	(8.76)	(3.13)	(7.31)	(2.91)	(5.97)
Direct bank	0.09	0.41**	-0.05	0.61**	0.14	0.54
	(1.35)	(1.96)	(-0.37)	(2.16)	(0.30)	(1.34)
Sustainability bank	0.30***	1.31***	0.44***	1.30***	0.57***	1.22***
	(3.39)	(11.16)	(3.20)	(6.73)	(4.03)	(5.22)
	Estimated average WTP (fixed yearly interest rate)					
Consideration of sustainability criteria without certificate	-0.11		-0.13		-0.12	
Consideration of sustainability criteria with certificate	-0.24		-0.31		-0.30	
Transparency logo issued by NGO	-0.18		-0.21		-0.21	
Transparency logo by issued the state	-0.23		-0.26		-0.26	
Municipal savings bank	-0.11		-0.10		-0.13	
Co-operative bank	-0.11		-0.09		-0.09	
Direct bank	-		-		-	
Sustainability bank	-0.07		-0.09		-0.12	

Note: For all SML estimations 1000 Halton draws were used. The basis of the estimation results in this table are data from the first SC experiment with $M = 6$ choice sets and different numbers of respondents and thus observations. The upper part of the table reports for each explanatory variable the parameter estimates and the corresponding robust z-statistics in parentheses. * (**, ***) means that the appropriate parameter is different from zero at the 10% (5%, 1%) significance level, respectively. The lower part of the table reports the mean WTP estimates for each non-financial variable if the corresponding mean of the random parameters is significantly different from zero. The values are calculated by dividing the estimated mean of the random parameters of the non-financial variables by the estimated parameters of the yearly nominal interest rates. All model specifications include the disaggregated dummy variables for sustainability criteria and transparency logo. The left part of the table refers to estimations results that only include respondents who stated after the experiments that the description of the choice situations was understandable (N = 837). The middle part of the table refers to estimations results that only include participants who stated separately for each choice set they are rather or very sure that they would purchase the investment product in reality (possible response categories were “very unsure”, “rather unsure”, “neither sure nor unsure”, “rather sure”, and “very sure”). The right part of the table refers to estimations results that only include respondents who stated after the experiments both that the description of the choice situations was understandable and separately for each choice set that they are rather or very sure that they would purchase the investment product in reality.

Table 17: Mean WTP estimates for sustainability criteria sustainable investments in the choice among four three-year fixed-interest rate investment products in different investor groups

	Consideration of sustainability criteria	Consideration of sustainability criteria without certificate	Consideration of sustainability criteria with certificate
All *N* = 1001 respondents	-0.21	-0.11	-0.25
Warm glow =1 (428 respondents)	-0.34	-0.17	-0.40
Warm glow = 0 (508 respondents)	-0.13	-0.08	-0.16
Expectation social environment =1 (92 respondents)	-0.38	-0.23	-0.44
Expectation social environment = 0 (863 respondents)	-0.20	-0.10	-0.24
Membership environmental organization =1 (95 respondents)	-0.40	-0.18	-0.47
Membership environmental organization = 0 (847 respondents)	-0.20	-0.11	-0.23
Affinity left-wing parties = 1 (380 respondents)	-0.34	-0.20	-0.38
Affinity left-wing parties = 0 (398 respondents)	-0.16	-0.08	-0.21
Female = 1 (488 respondents)	-0.23	-0.12	-0.27
Female = 0 (513 respondents)	-0.20	-0.11	-0.23
Older respondent = 1 (527 respondents)	-0.21	-0.10	-0.23
Older respondent = 0 (474 respondents)	-0.22	-0.12	-0.26
High education = 1 (607 respondents)	-0.21	-0.11	-0.25
High education = 0 (390 respondents)	-0.22	-0.13	-0.25
Living together or married = 1 (662 respondents)	-0.21	-0.10	-0.25
Living together or married = 0 (333 respondents)	-0.21	-0.13	-0.25
Western Germany = 1 (825 respondents)	-0.21	-0.11	-0.25
Western Germany = 0 (176 respondents)	-0.25	-0.13	-0.26

Table 18: Simulated ML estimates (z-statistics) in a latent class model with two classes and individual characteristics explaining the class membership

	Class 1		Class 2	
Variables	Parameter estimate (z-statistic)	Estimated average WTP	Parameter estimate (z-statistic)	Estimated average WTP
Yearly nominal interest rate	1.71***	--	10.76***	--
	(15.40)		(14.69)	
Consideration of sustainability criteria	0.90***	-0.53	0.67***	-0.06
	(16.37)		(4.81)	
Transparency logo	0.87***	-0.51	0.94***	-0.09
	(15.67)		(7.07)	
Municipal savings bank	0.68***	-0.40	0.15	-
	(8.58)		(0.84)	
Co-operative bank	0.67***	-0.39	0.33*	-0.03
	(8.34)		(1.85)	
Direct bank	0.27***	-0.16	-0.20	-
	(3.32)		(-1.08)	
Sustainability bank	0.49***	-0.29	-0.53**	0.05
	(5.99)		(-2.52)	
Female	0.41**		-	
	(1.99)			
Age	0.01*		-	
	(1.83)			
High education	-0.41*		-	
	(-1.95)			
Living together or married	-0.04		-	
	(-0.18)			
Western Germany	-0.72***		-	
	(-2.64)			
Warm glow	1.05***		-	
	(4.75)			
Expectation social environment	0.74*		-	
	(1.71)			
Membership environmental organization	1.32***		-	
	(2.88)			
Affinity left-wing parties	0.60***		-	
	(3.01)			
Constant	-0.19			
	(-0.37)			
Estimated class share	0.647		0.353	

Table 19: Simulated ML estimates (z-statistics) in a latent class model with three classes and individual characteristics explaining the class membership

	Class 1		Class 2		Class 3	
Variables	Parameter estimate (z-statistic)	Estimated average WTP	Parameter estimate (z-statistic)	Estimated average WTP	Parameter estimate (z-statistic)	Estimated average WTP
Yearly nominal interest rate	2.88*** (14.43)	--	0.82*** (4.41)	--	11.23*** (13.19)	--
Consideration of sustainability criteria	1.64*** (13.76)	-0.57	0.20** (2.00)	-0.24	0.64*** (4.32)	-0.06
Transparency logo	1.40*** (13.88)	-0.49	0.41*** (3.69)	-0.50	1.01*** (6.78)	-0.09
Municipal savings bank	0.56*** (4.04)	-0.19	0.79*** (5.84)	-0.96	0.20 (1.02)	-
Co-operative bank	0.62*** (4.51)	-0.22	0.76*** (5.75)	-0.93	0.26 (1.39)	-
Direct bank	0.51*** (3.66)	-0.18	0.00 (0.03)	-	-0.22 (-1.13)	-
Sustainability bank	0.93*** (6.56)	-0.32	-0.31* (-1.75)	0.38	-0.61*** (-2.78)	0.05
Female	0.49 (1.53)		0.41* (1.68)		-	
Age	0.02 (1.60)		0.01 (1.38)		-	
High education	-0.16 (-0.60)		-0.69*** (-2.76)		-	
Living together or married	0.09 (0.33)		-0.12 (-0.45)		-	
Western Germany	-0.72** (-2.28)		-0.55* (-1.74		-	
Warm glow	1.72*** (6.58)		0.18 (0.64)		-	
Expectation social environment	0.45 (0.90)		1.27*** (2.59)		-	
Membership environmental organization	1.47*** (2.85)		1.31** (2.49)		-	
Affinity left-wing parties	0.99*** (3.98)		0.18 (0.73)		-	
Constant	-1.46** (-2.18)		-0.52 (-0.67)			
Estimated class share	0.413		0.250		0.336	

Table 20: Descriptive statistics of all variables

Variables	# of observations	Mean	Variance	Minimum	Maximum
		Dependent variables			
Investor type	801	-	-	1	4
Current SRI investor	801	0.2397	0.42	0	1
Potential SRI investor	801	0.4457	0.50	0	1
		Explanatory variables			
Perceived information costs					
Too little knowledge	765	0.4967	0.50	0	1
Poorly informed	781	0.6133	0.49	0	1
No offer by bank	739	0.6211	0.49	0	1
Number of information sources	768	2.5273	1.29	1	8
Distrust	734	0.3787	0.49	0	1
Perceived (relative) financial performance					
Lower return	646	0.5898	0.49	0	1
Higher risk	665	0.3308	0.47	0	1
Higher fees	635	0.3559	0.48	0	1
Sociodemographic and socioeconomic variables					
Age	801	44.7116	12.70	19	78
Female	801	0.4395	0.50	0	1
University degree	799	0.3717	0.48	0	1
Income	645	0.4992	0.50	0	1
Wealth	560	0.2893	0.45	0	1

Table 21: Attributes used to describe the different alternative funds and their corresponding levels

Attributes	Levels: conventional equity fund	Levels: sustainable equity fund
Return last year	4.00%, 5.00%, 6.00%, 7.00%, 8.00%	4.00%, 5.00%, 6.00%, 7.00%, 8.00%
Average return p.a. in the last five years	3.00%, 5.00%, 6.00%, 7.00%, 9.00%	3.00%, 5.00%, 6.00%, 7.00%, 9.00%
Subscription fee	3.00%, 4.00%, 5.00%	3.00%, 4.00%, 5.00%
Sustainability criteria	No consideration	Consideration without sustainability certificate Consideration with sustainability certificate
Transparency logo	No transparency logo Transparency logo by NGO Transparency logo by state	No transparency logo Transparency logo by NGO Transparency logo by state

Table 22: Exemplary choice set

Attribute	Fund A	Fund B	Fund C	Fund D
Return last year	4.00%	8.00%	7.00%	5.00%
Average return p.a. in the last five years	3.00%	7.00%	5.00%	9.00%
Subscription fee	3.00%	5.00%	5.00%	4.00%
Transparency logo	Transparency logo by state	No transparency logo	Transparency logo by NGO	Transparency logo by NGO
Sustainability criteria	Consideration without certificate	No consideration	Consideration with certificate	No consideration
	□	□	□	□

Table 23: Descriptive analysis of the different statements

Variables		SR		SK		INT		CONV		χ^2 test p values	SR vs. SK	SR vs. INT	SR vs. CONV	SK vs. INT	SK vs. CONV	INT vs. CONV
		[%]	N	[%]	N	[%]	N	[%]	N							
Too little knowledge	0	81.7	104	58.8	80	48.3	244	40.1	337	0.000***	(<)***	(<)***	(<)***	(<)*	(<)***	(<)**
	1	18.3		41.2		51.7		59.9			0.00	0.00	0.00	0.05	0.00	0.02
Poorly informed	0	63.2	106	46.3	82	30.2	245	35.3	348	0.000***	(<)**	(<)***	(<)***	(<)***	(<)**	(<)
	1	36.8		53.6		69.8		64.7			0.01	0.00	0.00	0.00	0.03	0.90
No offer by bank	0	57.3	103	57.1	77	27.2	239	35.0	320	0.000***	(<)	(<)***	(<)***	(<)***	(<)***	(<)
	1	42.7		42.9		72.8		65.0			0.49	0.00	0.00	0.00	0.00	0.98
Distrust	0	71.8	103	55.8	77	68.2	239	55.9	315	0.002***	(<)**	(<)	(<)***	(<)	(<)	(<)***
	1	28.2		44.2		31.8		44.1			0.01	0.25	0.00	0.98	0.50	0.00
Lower return	0	51.0	100	36.5	74	43.8	226	35.8	246	0.041**	(<) **	(<)	(<)***	(<)	(<)	(<)**
	1	49.0		63.5		56.2		64.2			0.03	0.11	0.00	0.87	0.46	0.04
Higher risk	0	80.4	102	68.4	76	71.1	228	57.5	259	0.000***	(<)**	(<)**	(<)***	(<)	(<)**	(<)***
	1	19.6		31.6		29.0		42.5			0.03	0.04	0.00	0.67	0.04	0.00
Higher fees	0	72.0	100	75.00	72	64.5	217	58.1	246	0.016**	(<)	(<)*	(<)***	(<)*	(<)***	(<)*
	1	28.0		25.00		35.5		41.9			0.67	0.09	0.01	0.05	0.00	0.08

This table reports the descriptive analysis of the different statements across all investors that took part in the DCE and answered the respective questions. Direction of the alternative hypothesis: > "greater"; ≠ "two-sided"; < "less"; *, **, *** indicate significance at the ten percent, five percent, and one percent level, respectively.

Table 24: ML estimates of parameters and estimates of average marginal and discrete probability effects

Explanatory variables	(1) ML estimates of parameters	(2) Estimated average marginal and discrete probability effects	(3) ML estimates of parameters	(4) Estimated average marginal and discrete probability effects
Perceived information costs				
Too little knowledge	-0.447***	-0.134***	-0.498***	-0.179***
	(0.146)	(0.044)	(0.137)	(0.048)
Poorly informed	-0.176	-0.053	0.190	0.066
	(0.144)	(0.044)	(0.135)	(0.047)
No offer by bank	-0.648***	-0.207***	0.217*	0.076*
	(0.137)	(0.045)	(0.130)	(0.045)
Number of information sources	0.032	0.009	0.183***	0.064***
	(0.047)	(0.014)	(0.047)	(0.016)
Distrust	0.289**	0.086**	-0.459***	-0.166***
	(0.138)	(0.041)	(0.125)	(0.045)
Perceived (relative) financial performance				
Lower return	0.038	0.011	-0.213*	-0.076*
	(0.131)	(0.038)	(0.121)	(0.043)
Higher risk	-0.394***	-0.113***	-0.363***	-0.130***
	(0.139)	(0.038)	(0.126)	(0.045)
Higher fees	-0.317**	-0.092**	0.047	0.017
	(0.141)	(0.040)	(0.129)	(0.045)
Sociodemographic variables				
Age	-0.001	-0.000	-0.008*	-0.003*
	(0.005)	(0.001)	(0.004)	(0.002)
Female	0.195	0.058	-0.149	-0.053
	(0.131)	(0.039)	(0.122)	(0.044)
University degree	0.209*	0.063	0.183	0.065
	(0.126)	(0.038)	(0.118)	(0.042)
Constant	-0.038		0.320	
	(0.285)		(0.276)	

This table reports ML estimates of parameters and estimates of average marginal and discrete probability effects in two binary probit models, dependent variables: Being a current investor in SRI (column 1 and 2) and being a potential future investor in SRI (column 3 and 4), number of observations = 530. *** (**, *) means that the corresponding parameter estimates are significantly different from zero on a 1% (5%, 10%) significance level.

Table 25: Estimates of average marginal and discrete probability effects in a multinomial logit model

Explanatory variables	(1) SR	(2) SK	(3) INT	(4) CONV
Perceived information costs				
Too little knowledge	-0.136***	0.005	-0.049	0.180***
	(0.035)	(0.034)	(0.048)	(0.047)
Poorly informed	-0.050	0.000	0.117**	-0.067
	(0.035)	(0.033)	(0.046)	(0.046)
No offer by bank	-0.079**	-0.132***	0.157***	0.053
	(0.034)	(0.036)	(0.044)	(0.045)
Number of information sources	0.032***	-0.025**	0.032**	-0.039**
	(0.011)	(0.012)	(0.015)	(0.016)
Distrust	0.009	0.080**	-0.173***	0.084*
	(0.036)	(0.033)	(0.042)	(0.044)
Perceived (relative) financial performance				
Lower return	-0.015	0.028	-0.060	0.047
	(0.032)	(0.029)	(0.043)	(0.041)
Higher risk	-0.084***	-0.026	-0.048	0.158***
	(0.031)	(0.030)	(0.044)	(0.044)
Higher fees	-0.034	-0.053*	0.050	0.036
	(0.034)	(0.029)	(0.045)	(0.043)
Sociodemographic variables				
Age	0.001	-0.001	-0.003**	0.003**
	(0.001)	(0.001)	(0.002)	(0.002)
Female	0.013	0.047*	-0.067	0.007
	(0.034)	(0.029)	(0.043)	(0.041)
University degree	0.075**	-0.018	-0.011	-0.047
	(0.032)	(0.027)	(0.042)	(0.040)

This table reports estimates of average marginal and discrete probability effects in a multinomial logit model, dependent variable: 'Investor type' that takes the value 1 (= "SR", sustainable and responsible) for respondents that are currently invested SRI and plan to invest in SRI in the future, 2 (= "SK", skeptical) for respondents that are currently invested in SRI and do not plan to invest in SRI in the future, 3 (= "INT", interested) for respondents that are currently not invested in SRI and plan to invest in SRI in the future, and 4 (= "CONV", conventional) for respondents that are currently not invested in SRI and do not plan to invest in SRI in the future, number of observations = 530. *** (**, *) means that the corresponding parameter estimates are significantly different from zero on a 1% (5%, 10%) significance level.

Table 26: ML estimates of parameters in conditional logit models

Explanatory variables	(1) All	(2) SR	(3) SK	(4) INT	(5) CONV
Panel A					
Return last year	0.189***	0.171***	0.156***	0.178***	0.217***
	(0.012)	(0.032)	(0.034)	(0.021)	(0.018)
Return last five years	0.326***	0.258***	0.226***	0.299***	0.399***
	(0.009)	(0.025)	(0.026)	(0.016)	(0.015)
Subscription fee	-0.208***	-0.155***	-0.090	-0.214***	-0.257***
	(0.020)	(0.054)	(0.059)	(0.036)	(0.031)
Transparency label	0.650***	0.785***	0.311***	0.893***	0.563***
	(0.038)	(0.108)	(0.105)	(0.072)	(0.055)
Sustainable fund	-0.436***	-0.545***	-0.398***	-0.489***	-0.376***
	(0.040)	(0.106)	(0.120)	(0.069)	(0.064)
Conventional fund	-0.976***	-1.297***	-0.840***	-1.330***	-0.666***
	(0.038)	(0.108)	(0.114)	(0.071)	(0.058)
Panel B					
Return last year	0.188***	0.167***	0.150***	0.180***	0.217***
	(0.012)	(0.032)	(0.034)	(0.021)	(0.018)
Return last five years	0.323***	0.251***	0.220***	0.293***	0.399***
	(0.009)	(0.024)	(0.026)	(0.016)	(0.014)
Subscription fee	-0.208***	-0.151***	-0.092	-0.209***	-0.259***
	(0.020)	(0.053)	(0.059)	(0.035)	(0.031)
Transparency label	0.611***	0.635***	0.229*	0.836***	0.592***
	(0.046)	(0.133)	(0.132)	(0.088)	(0.068)
Certified sustainable fund	0.664***	0.671***	0.496**	0.846***	0.606***
	(0.070)	(0.192)	(0.201)	(0.130)	(0.104)
Transparency label * Certified sustainable fund	0.141*	0.431*	0.246	0.174	-0.063
	(0.084)	(0.231)	(0.258)	(0.153)	(0.128)
No. of observations	21536	2880	2144	6880	9632

This table reports ML estimates of parameters in CL models, dependent variable: 'Investor choice'. Panel A comprises the estimated parameters for 'Sustainable fund' and 'Conventional fund' and hence 'Certified sustainable fund' serves as base category for the corresponding attribute (Sustainability criteria). Panel B reports the estimation results needed to check hypothesis H4c and thus includes the estimates of an interaction term between 'Transparency label' and 'Certified sustainable fund'. Consequently, the estimated parameter of 'Certified sustainable fund' has to be interpreted relatively to both 'Sustainable fund' and 'Conventional fund'. All eight choice sets of the participants who stated that they understood the experimental task are considered, number of individuals = 673. *** (**, *) means that the corresponding parameter estimates are significantly different from zero on a 1% (5%, 10%) significance level.

Table 27: ML estimates of parameters in conditional logit models with interactions

Explanatory variables	(1) Base: SR	(2) Base: SK	(3) Base: INT	(4) Base: CONV
Return last year	0.191***	0.191***	0.191***	0.191***
	(0.012)	(0.012)	(0.012)	(0.012)
Return last five years	0.330***	0.330***	0.330***	0.330***
	(0.009)	(0.009)	(0.009)	(0.009)
Subscription fee	-0.211***	-0.211***	-0.211***	-0.211***
	(0.020)	(0.020)	(0.020)	(0.020)
Transparency label	0.816***	0.347***	0.912***	0.523***
	(0.114)	(0.113)	(0.073)	(0.052)
Transparency label * SR	-	0.470***	-0.096	0.293**
	-	(0.160)	(0.135)	(0.125)
Transparency label * SK	-0.470***	-	-0.565***	-0.176
	(0.160)	-	(0.134)	(0.124)
Transparency label * INT	0.096	0.565***	-	0.389***
	(0.135)	(0.134)	-	(0.090)
Transparency label * CONV	-0.293**	0.176	-0.389***	-
	(0.125)	(0.124)	(0.090)	-
Sustainable fund	-0.590***	-0.430***	-0.506***	-0.349***
	(0.111)	(0.130)	(0.070)	(0.060)
Sustainable fund * SR	-	-0.159	-0.084	-0.241*
	-	(0.171)	(0.131)	(0.127)
Sustainable fund * SK	0.159	-	0.076	-0.082
	(0.171)	-	(0.148)	(0.144)
Sustainable fund * INT	0.084	-0.076	-	-0.157*
	(0.131)	(0.148)	-	(0.093)
Sustainable fund * CONV	0.241*	0.082	0.157*	-
	(0.127)	(0.144)	(0.093)	-
Conventional fund	-1.379***	-0.924***	-1.360***	-0.629***
	(0.111)	(0.124)	(0.071)	(0.054)
Conventional fund * SR	-	-0.455***	-0.019	-0.750***
	-	(0.165)	(0.131)	(0.123)
Conventional fund * SK	0.455***	-	0.436***	-0.295**
	(0.165)	-	(0.142)	(0.135)
Conventional fund * INT	0.019	-0.436***	-	-0.731***
	(0.131)	(0.142)	-	(0.089)
Conventional fund * CONV	0.750***	0.295**	0.731***	-
	(0.123)	(0.135)	(0.089)	-

This table reports ML estimates of parameters in CL models, dependent variable: 'Investor choice'. The dummy variables 'Transparency label', 'Sustainability fund', and 'Conventional fund' are interacted with dummy variables for the different investor groups. Only investors stating that they understood the experimental task and all eight choice sets are considered, number of individuals = 673. *** (**, *) means that the corresponding parameter estimates are significantly different from zero on a 1% (5%, 10%) significance level.

Table 28: Overview of hypotheses

Pro-environmental behavior and religion	
1a	(Religious) Catholics or Protestants are ***less*** likely to consider ecological criteria in purchase and consumption decisions than non-religious persons.
1b	An increasing regional share of Catholics or Protestants ***negatively*** influences the propensity to consider ecological criteria in purchase and consumption decisions among persons living in these areas.
1c	(Religious) Catholics or Protestants are ***more*** likely to consider ecological criteria in purchase and consumption decisions than non-religious persons.
1d	An increasing regional share of Catholics or Protestants ***positively*** influences the propensity to consider ecological criteria in purchase and consumption decisions among persons living in these areas.
1e	(Religious) Catholics or Protestants are ***more*** likely to consider ecological criteria in investment decisions than non-religious persons.
1f	An increasing regional share of Catholics or Protestants ***positively*** influences the propensity to consider ecological criteria in investment decisions among persons living in these areas.
Pro-environmental behavior and political orientation	
2a	Persons generally preferring the Green Party or left-wing parties are ***more*** likely to consider ecological criteria in purchase and consumption decisions than persons preferring conservative parties.
2b	An increasing regional share of the Green Party or left-wing parties ***positively*** influences the propensity to consider ecological criteria in purchase and consumption decisions among persons living in these areas.
2c	Persons generally preferring the Green Party or left-wing parties are ***more*** likely to consider ecological criteria in investment decisions than persons preferring conservative parties.
2d	An increasing regional share of the Green Party or left-wing parties ***positively*** influences the propensity to consider ecological criteria in investment decisions among persons living in these areas.
Pro-social behavior and religion	
3a	(Religious) Catholics or Protestants are ***more*** likely to consider social or ethical criteria in purchase and consumption decisions than non-religious persons.
3b	An increasing regional share of Catholics or Protestants ***negatively*** influences the propensity to consider social or ethical criteria in purchase and consumption decisions among persons living in these areas.
3c	(Religious) Catholics or Protestants are ***more*** likely to consider social or ethical criteria in investment decisions than non-religious persons.
3d	An increasing regional share of Catholics or Protestants ***positively*** influences the propensity to consider social or ethical criteria in investment decisions among persons living in these areas.

Pro-social behavior and political orientation	
4a	Persons generally preferring the Green Party or left-wing parties are ***more*** likely to consider social or ethical criteria in purchase and consumption decisions than persons preferring conservative parties.
4b	An increasing regional share of the Green Party or left-wing parties ***positively*** influences the propensity to consider social or ethical criteria in purchase and consumption decisions among persons living in these areas.
4c	Persons generally preferring the Green Party or left-wing parties are ***more*** likely to consider social or ethical criteria in investment decisions than persons preferring conservative parties.
4d	An increasing regional share of the Green Party or left-wing parties ***positively*** influences the propensity to consider social or ethical criteria in investment decisions among persons living in these areas

Table 29: Relative frequencies for dependent variables with ordinal scale

Dependent variable	1 [%]	2 [%]	3 [%]	4 [%]	5 [%]	No. of observations
Eco electronic	5.81	9.22	22.14	38.38	24.45	998
Eco clothes	8.82	20.44	40.28	25.75	4.71	998
Eco car	5.86	9.26	28.60	41.56	14.71	972
Eco food	8.02	13.83	30.46	36.27	11.42	998
Eco invest	13.40	18.25	49.38	16.60	2.27	970
Social electronic	8.97	19.46	42.84	21.88	6.85	992
Social clothes	7.14	16.68	36.18	31.76	8.24	995
Social car	10.65	18.20	44.36	20.68	6.10	967
Social food	7.74	16.98	34.67	32.36	8.24	995
Social invest	11.81	16.84	50.31	18.58	2.46	974
Choice transport	8.57	18.85	31.45	28.43	12.70	992
Freq. car	7.35	17.62	33.62	31.46	9.95	925
Freq. travel	12.16	23.20	40.63	19.25	4.76	987
Freq. flights	11.99	21.48	34.83	20.13	11.57	959
Choice destinations	11.44	23.89	38.06	20.75	5.87	988
Freq. meat and milk	10.56	19.22	33.20	26.16	10.87	994

Table 30: Descriptive statistics for further dependent variables

Dependent variables	No. of observations	Mean	Standard deviation	Minimum	Maximum
Eco activity index	882	1.97	1.84	0	6
Eco purchases index	970	1.97	1.35	0	4
Eco index	877	3.96	2.76	0	10
Social purchases index	967	1.35	1.47	0	4
Dummy: Eco invest	970	0.19	0.39	0	1
Dummy: Social invest	974	0.21	0.41	0	1

Table 31: Descriptive statistics for all explanatory variables

Explanatory variables	No. of observations	Mean	Variance	Minimum	Maximum
Individual religiosity					
Catholic	901	0.26	0.44	0	1
Protestant	901	0.30	0.46	0	1
Other religions	901	0.04	0.20	0	1
Religiously active C+P	716	0.26	0.44	0	1
Religiously active others[i)]	716	0.03	0.16	0	1
Regional religiosity					
Share of Catholics	984	0.30	0.21	0.02	0.89
Share of Protestants	984	0.31	0.15	0.05	0.72
Share of others[ii)]	984	0.28	0.11	0	0.56
Individual political orientation					
SPD	778	0.26	0.44	0	1
Left Party	778	0.10	0.30	0	1
Green Party	778	0.13	0.34	0	1
Other parties[iii)]	778	0.12	0.33	0	1
Regional political orientation					
SPD share	984	0.26	0.07	0.11	0.49
Left Party share	984	0.08	0.06	0.03	0.27
Green Party share	984	0.09	0.03	0.03	0.22
Other parties' share[iv)]	984	0.11	0.02	0.05	0.19
Controls					
Voluntarily active	960	0.40	0.49	0	1
Environmental organization	942	0.10	0.30	0	1
Age	1001	43.91	12.97	18	78
Female	1001	0.49	0.50	0	1
University degree	997	0.36	0.48	0	1
Income	808	0.46	0.50	0	1
Married	995	0.51	0.50	0	1
Kids	1001	0.31	0.46	0	1

i) Hence the reference group is very heterogeneous and contains both persons with a religious affiliation who stated that they do not actively pursue their religion at least one day per week and those with no religious affiliation. ii) This is a very heterogeneous group, which is included as we want to ensure that the share of non-adherents represents the base group. iii) Thus, the base group contains persons that generally prefer the Christian Democratic Party or the Liberal Party. iv) This is a very heterogeneous group, which is included as we want to ensure that the share of the Christian Democratic Party represents the base group.

Table 32: ML estimates for parameters in Negbin II regression, Poisson regression, and bivariate probit models

Explanatory variables	(1) Eco activity index	(2) Eco purchases index	(3) Eco index	(4) Social purchases index	(5) Dummy: Eco invest	(6) Dummy: Social invest
Individual and regional religiosity						
Catholic	0.32***	0.02	0.21**	0.15	0.48***	0.26
	(0.11)	(0.08)	(0.08)	(0.13)	(0.17)	(0.17)
Protestant	0.23**	-0.01	0.13*	0.07	0.44***	0.18
	(0.10)	(0.07)	(0.07)	(0.11)	(0.16)	(0.15)
Other religions	0.08	0.06	0.12	0.14	0.31	0.15
	(0.23)	(0.15)	(0.17)	(0.25)	(0.34)	(0.34)
Share of Catholics	2.64**	1.08	1.89**	0.44	-0.73	-1.12
	(1.09)	(0.79)	(0.84)	(1.41)	(1.80)	(1.84)
Share of Protestants	3.04***	1.35	2.27**	0.98	-0.61	-1.64
	(1.18)	(0.83)	(0.89)	(1.47)	(1.92)	(2.00)
Share of others	3.81***	1.38	2.63**	0.93	-0.98	-2.58
	(1.38)	(0.99)	(1.06)	(1.78)	(2.23)	(2.37)
Individual and regional political orientation						
SPD	0.12	0.03	0.06	0.14	0.08	-0.05
	(0.10)	(0.07)	(0.08)	(0.12)	(0.17)	(0.16)
Left Party	0.43***	0.21**	0.33***	0.44***	0.59***	0.51**
	(0.14)	(0.10)	(0.11)	(0.16)	(0.21)	(0.21)
Green Party	0.52***	0.24***	0.35***	0.35**	0.55***	0.30
	(0.12)	(0.09)	(0.09)	(0.14)	(0.20)	(0.20)
Other parties	0.03	-0.05	-0.03	-0.11	0.15	-0.15
	(0.13)	(0.10)	(0.11)	(0.17)	(0.20)	(0.21)
SPD share	-0.15	-1.88***	-1.11*	-0.69	1.48	1.46
	(0.82)	(0.56)	(0.64)	(0.98)	(1.26)	(1.29)
Left Party share	3.42*	1.40	2.46*	0.44	2.02	2.22
	(1.95)	(1.30)	(1.43)	(2.32)	(3.19)	(2.94)
Green Party share	2.35	1.65	2.01*	1.35	5.72**	5.83**
	(1.47)	(1.01)	(1.12)	(1.74)	(2.41)	(2.35)
Other party shares	0.22	0.74	0.46	3.55	4.82	2.22
	(1.99)	(1.47)	(1.52)	(2.57)	(3.32)	(3.27)
Controls						
Voluntarily active	0.17**	0.17***	0.17***	0.34***	0.26**	0.46***
	(0.08)	(0.06)	(0.06)	(0.09)	(0.13)	(0.12)
Environmental organization	0.20*	0.24***	0.22***	0.26**	0.33*	0.49***
	(0.11)	(0.07)	(0.08)	(0.12)	(0.19)	(0.18)
Constant	-2.98***	-0.69	-1.22	-1.36	-2.08	-0.57
	(1.12)	(0.83)	(0.86)	(1.45)	(1.86)	(1.90)
Further controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	542	597	540	598	605	
LR test statistic	78.52***	84.26***	79.37***	51.35***	75.17***	

This table reports the ML parameter estimates in Negbin II regression models (column 1, 3, and 4), a Poisson regression model (column 2), and a bivariate probit model (column 5 and 6), dependent variables: 'Eco activity index', 'Eco purchases index', 'Eco index', and 'Social purchases index' are count data variables, while 'Dummy: Eco invest' and 'Dummy: Social invest' are binary variables, number of observations = 542, 597, 540, 598, and 605, respectively. Heteroscedasticity-robust estimates of the standard deviations are reported in parentheses. '*' ('**', '***') means that the corresponding estimates are significantly different from zero on a 10% (5%, 1%) significance level.

Table 33: ML estimates for parameters in Negbin II regression, Poisson regression, and bivariate probit models

Explanatory variables	(1) Eco activity index	(2) Eco purchases index	(3) Eco index	(4) Social purchases index	(5) Dummy: Eco invest	(6) Dummy: Social invest
Individual and regional religiosity						
Religiously active C+P	0.44***	0.17**	0.32***	0.47***	0.69***	0.41***
	(0.10)	(0.07)	(0.07)	(0.11)	(0.17)	(0.15)
Religiously active others	0.16	0.05	0.13	0.04	0.50	0.29
	(0.22)	(0.18)	(0.19)	(0.29)	(0.43)	(0.43)
Share of Catholics	2.84**	1.37	2.22**	0.59	-1.30	-2.30
	(1.21)	(0.84)	(0.91)	(1.60)	(2.10)	(2.15)
Share of Protestants	2.94**	1.61*	2.40**	1.13	-1.08	-2.83
	(1.34)	(0.89)	(1.00)	(1.69)	(2.24)	(2.38)
Share of others	3.95***	1.84*	3.06***	1.22	-2.41	-4.45
	(1.49)	(1.02)	(1.14)	(2.00)	(2.48)	(2.77)
Individual and regional political orientation						
SPD	0.20*	0.14*	0.16*	0.29**	0.42**	0.27
	(0.11)	(0.08)	(0.08)	(0.14)	(0.20)	(0.18)
Left Party	0.42***	0.26**	0.35***	0.54***	0.70***	0.64***
	(0.15)	(0.10)	(0.11)	(0.17)	(0.23)	(0.23)
Green Party	0.65***	0.34***	0.47***	0.55***	0.75***	0.45**
	(0.13)	(0.09)	(0.09)	(0.16)	(0.23)	(0.22)
Other parties	0.07	0.03	0.05	0.05	0.14	-0.12
	(0.15)	(0.11)	(0.12)	(0.19)	(0.24)	(0.25)
SPD share	0.39	-1.97***	-0.78	-0.91	1.05	1.75
	(0.90)	(0.61)	(0.69)	(1.11)	(1.49)	(1.50)
Left Party share	3.41	2.16	2.80*	1.71	2.57	1.54
	(2.22)	(1.49)	(1.60)	(2.76)	(4.00)	(3.50)
Green Party share	2.96*	1.75	2.15*	1.78	8.32***	7.85***
	(1.67)	(1.09)	(1.24)	(2.03)	(2.83)	(2.71)
Other party shares	1.49	0.37	1.04	1.22	4.06	1.79
	(2.21)	(1.58)	(1.65)	(2.89)	(3.89)	(3.76)
Controls						
Voluntarily active	0.17*	0.16***	0.17**	0.34***	0.33**	0.56***
	(0.09)	(0.06)	(0.07)	(0.11)	(0.15)	(0.15)
Environmental organization	0.21*	0.23***	0.22**	0.23*	0.25	0.54***
	(0.11)	(0.08)	(0.09)	(0.13)	(0.23)	(0.20)
Constant	-3.50***	-1.18	-1.82*	-1.72	-1.69	0.22
	(1.26)	(0.90)	(0.95)	(1.66)	(2.18)	(2.20)
Further controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	444	489	442	491	497	
LR test statistic	93.52***	96.65***	102.1***	68.14***	84.61***	

This table reports the ML parameter estimates in Negbin II regression models (column 1, 3, and 4), a Poisson regression model (column 2), and a bivariate probit model (column 5 and 6), dependent variables: 'Eco activity index', 'Eco purchases index', 'Eco index', and 'Social purchases index' are count data variables, while 'Dummy: Eco invest' and 'Dummy: Social invest' are binary variables, number of observations = 444, 489, 442, 491, and 497, respectively. Heteroscedasticity-robust estimates of the standard deviations are reported in parentheses. '*' ('**', '***') means that the corresponding estimates are significantly different from zero on a 10% (5%, 1%) significance level.

Table 34: Estimated average discrete and marginal probability effects of religion and political orientation on pro-ecological purchase and investment decisions

#	Explanatory variables	Eco electronic		Eco clothes		Eco car		Eco food		Eco invest	
4	Religiously active C+P		-		0.06[b]		0.03[a]		0.06[c]		0.10[c]
	Catholic	-		-		-		-		0.05[a]	
	Protestant	-		-		-		-		0.08[c]	
	Share of Catholics	-	-	0.70[b]	0.61[a]	-	-	0.41[a]	0.44[a]	0.55[a]	-
	Share of Protestants	-	-	0.81[b]	0.71[b]	-	-	0.49[b]	0.55[b]	0.52[a]	-
	SPD	-	0.01[a]	-	-	-	0.03[a]	-	-	-	-
	Left Party	-	0.01[a]	-	0.07[a]	-	-	0.04[a]	0.05[b]	-	-
	Green Party	-	-	-	0.09[b]	0.03[a]	0.03[a]	0.08[c]	0.09[c]	-	0.07[a]
	SPD share	-	-	-0.48[b]	-0.42[b]	-0.35[b]	-0.43[c]	-0.39[b]	-0.41[b]	-	-
	Left Party share	-	-	1.16[b]	1.07[b]	-	-	0.72[a]	0.82[a]	1.26[b]	1.12[b]
	Green Party share	-	-	-	-	-	-	0.58[a]	0.64[a]	0.79[b]	0.98[b]
5	Religiously active C+P		-		0.03[b]		-		0.07[b]		0.01[b]
	Catholic	-		-		-		-		-	
	Protestant	-		-		-		-		0.02[b]	
	Share of Catholics	-	-	0.29[b]	0.28[a]	-	-	0.45[a]	0.47[a]	0.10[a]	-
	Share of Protestants	-	-	0.33[b]	0.33[a]	-	-	0.53[b]	0.59[b]	-	-
	SPD	-	-	-	-	-	-	-	-	-	-
	Left Party	-	-	-	-	-	-	-	0.08[a]	-	-
	Green Party	0.09[a]	0.11[a]	-	0.05[a]	-	-	0.14[c]	0.18[c]	-	-
	SPD share	-	-	-0.19[b]	-0.20[a]	-0.59[b]	-0.68[c]	-0.43[b]	-0.44[b]	-	-
	Left Party share	-	-	0.47[b]	0.49[a]	-	-	0.79[a]	0.89[a]	0.24[b]	0.14[a]
	Green Party share	-	-	-	-	-	-	0.64[a]	0.70[a]	0.15[a]	0.13[a]

This table reports all significant estimated average discrete and marginal effects for the main explanatory variables on the probability that a respondent rather strongly (value 4) or very strongly (value 5) considers ecological criteria when purchasing electronic devices (column 1), clothes (column 2), cars (column 3), food (column 4), or when making an investment decision (column 5), dependent variables: 'Eco electronic', 'Eco clothes', 'Eco car', 'Eco food', and 'Eco invest'. All estimated probability effects are derived on the basis of SML estimates of a multivariate ordered probit model, number of observations = 585 (when considering individual religious affiliation) and 479 (when considering religious activity), respectively. 'a' ('b', 'c') means that the corresponding estimates are significantly different from zero on a 10% (5%, 1%) significance level.

Table 35: Estimated average discrete and marginal probability effects of religion and political orientation on pro-ecological activities and behaviors

#	Explanatory variables	Choice transport		Freq. car		Freq. travel		Freq. flights		Choice destinations		Freq. meat and milk	
4	Religiously active C+P		0.10^{c}		0.05^{b}		0.06^{b}		0.05^{c}		0.07^{c}		0.07^{c}
	Catholic	0.05^{b}		-		0.06^{b}		0.04^{b}		0.06^{c}		0.03^{a}	
	Protestant	0.04^{a}		-		-		0.03^{a}		-		0.06^{c}	
	Share of Catholics	-	-	-	-	0.56^{b}	0.58^{b}	0.48^{b}	0.46^{b}	0.42^{a}	0.54^{a}	0.39^{a}	0.39^{a}
	Share of Protestants	-	-	-	-	0.66^{b}	0.60^{b}	0.50^{b}	0.44^{b}	0.57^{b}	0.66^{b}	0.49^{b}	0.50^{b}
	SPD	-	-	-	0.04^{a}	-	0.04^{a}	-	-	-	-	-	0.04^{b}
	Left Party	0.05^{a}	0.05^{a}	-	-	0.07^{b}	0.06^{b}	-	-	0.08^{c}	0.09^{c}	0.06^{b}	0.08^{c}
	Green Party	0.08^{c}	0.10^{c}	0.09^{c}	0.10^{c}	0.09^{c}	0.12^{c}	0.05^{c}	0.06^{c}	0.07^{b}	0.09^{c}	0.05^{b}	0.07^{c}
	SPD share	-	-	-	-	-	-	-	-	-0.38^{b}	-	-0.41^{b}	-0.32^{a}
	Left Party share	-	-	-	-	-	-	-	-	-	-	-	-
	Green Party share	0.83^{b}	0.70^{a}	-	-	-	-	-	-	-	-	-	-
5	Religiously active C+P		0.11^{c}		0.05^{b}		0.04^{b}		0.10^{c}		0.05^{c}		-
	Catholic	0.05^{a}		-		0.04^{b}		0.06^{b}		0.05^{b}		-	
	Protestant	-		-		-		0.05^{a}		-		0.07^{b}	
	Share of Catholics	-	-	-	-	0.36^{b}	0.36^{b}	0.70^{b}	0.77^{b}	0.30^{a}	0.35^{a}	0.43^{a}	0.44^{a}
	Share of Protestants	-	-	-	-	0.42^{b}	0.37^{b}	0.72^{b}	0.74^{b}	0.40^{b}	0.43^{b}	0.54^{b}	0.57^{b}
	SPD	-	-	-	0.04^{a}	-	-	-	-	-	-	-	0.05^{a}
	Left Party	-	-	-	-	0.06^{a}	0.05^{a}	-	-	0.08^{b}	0.08^{b}	0.09^{a}	0.14^{b}
	Green Party	0.12^{c}	0.14^{c}	0.13^{c}	0.18^{c}	0.08^{b}	0.10^{c}	0.11^{b}	0.15^{c}	0.06^{b}	0.08^{b}	0.06^{a}	0.12^{c}
	SPD share	-	-	-	-	-	-	-	-	-0.27^{b}	-	-0.45^{b}	-0.36^{a}
	Left Party share	-	-	-	-	-	-	-	-	-	-	-	-
	Green Party share	0.79^{b}	0.62^{a}	-	-	-	-	-	-	-	-	-	-

This table reports all significant estimated average discrete and marginal effects for the main explanatory variables on the probability that a respondent rather strongly (value 4) or very strongly (value 5) considers ecological criteria with respect to the choice of means of transport (column 1), frequency of car use (column 2), frequency of private journeys (column 3), frequency of private flights (column 4), choice of holiday destinations (column 5), or frequency of meat and dairy product consumption (column 6), dependent variables: 'Choice transport', 'Freq. car', 'Freq. travel', 'Freq. flights', 'Choice destination', and 'Freq. meat and milk'. All estimated probability effects are derived on the basis of SML estimates of a multivariate ordered probit model, number of observations = 542 (when considering individual religious affiliation) and 444 (when considering religious activity), respectively. 'a' ('b', 'c') means that the corresponding estimates are significantly different from zero on a 10% (5%, 1%) significance level.

Table 36: Estimated average discrete and marginal probability effects of religion and political orientation on pro-social purchase and investment decisions

#	Explanatory variables	Social electronic		Social clothes		Social car		Social food		Social invest	
4	Religiously active C+P		0.07[c]		0.06[c]		0.08[c]		0.07[c]		0.07[c]
	Catholic	0.04[a]		-		-		-		-	
	Protestant	-		-		-		-		0.05[b]	
	Share of Catholics	-	-	-	-	0.41[a]	0.48[a]	0.69[c]	0.77[c]	-	-
	Share of Protestants	0.45[a]	0.53[a]	-	-	0.54[b]	0.62[b]	0.81[c]	0.91[c]	-	-
	SPD	-	0.05[b]	-	0.05[b]	-	0.05[b]	-	0.04[b]	-	0.05[a]
	Left Party	0.06[b]	0.07[b]	-	0.06[a]	-	0.06[a]	0.05[a]	0.06[b]	0.06[a]	0.08[a]
	Green Party	-	0.05[a]	0.05[a]	0.07[c]	-	0.06[a]	0.05[a]	0.08[c]	-	0.08[b]
	SPD share	-0.37[b]	-0.47[c]	-0.20	-	-	-0.33[a]	-0.39[b]	-0.55[c]	-	-
	Left Party share	-	-	-	-	-	-	0.86[b]	0.96[b]	-	-
	Green Party share	-	-	-	-	-	-	-	0.10	-	0.74[a]
5	Religiously active C+P		0.07[c]		0.05[b]		0.06[c]		0.07[c]		0.02[b]
	Catholic	-		-		-		-		-	
	Protestant	-		-		-		-		0.02[a]	
	Share of Catholics	-	-	-	-	0.30[a]	0.33[a]	0.59[c]	0.65[c]	-	-
	Share of Protestants	0.41[a]	0.43[a]	-	-	0.40[b]	0.43[b]	0.70[c]	0.77[c]	-	-
	SPD	-	0.04[b]	-	0.04[a]	-	0.04[b]	-	0.04[a]	-	-
	Left Party	0.07[a]	0.07[b]	-	-	-	-	-	0.06[a]	-	-
	Green Party	-	0.04	-	0.07[b]	-	-	-	0.10[b]	-	0.03[a]
	SPD share	-0.33[b]	-0.38[c]	-	-	-	-0.23[a]	-0.33[b]	-0.47[c]	-	-
	Left Party share	-	-	-	-	-	-	0.74[b]	0.80[a]	-	-
	Green Party share	-	-	-	-	-	-	-	-	-	-

This table reports all significant estimated average discrete and marginal effects for the main explanatory variables on the probability that a respondent rather strongly (value 4) or very strongly (value 5) considers social/ethical criteria when purchasing electronic devices (column 1), clothes (column 2), cars (column 3), food (column 4), or when making an investment decisions (column 5), dependent variables: 'Social electronic', 'Social clothes', 'Social car', 'Social food', and 'Social invest'. All estimated probability effects are derived on the basis of SML estimates of a multivariate ordered probit model, number of observations = 588 (when considering individual religious affiliation) and 483 (when considering religious activity), respectively. 'a' ('b', 'c') means that the corresponding estimates are significantly different from zero on a 10% (5%, 1%) significance level.

Appendix B: Figures

Figure 1: Exemplary choice set for the first SC experiment on three-year fixed-interest rate investment products

Appendix C: Questionnaire (original German version)

[Hinweis: Kommentare und Filter werden in () angezeigt.]

Frage 1: Geben Sie bitte an, welche der folgenden Aussagen auf Sie persönlich zutrifft, wenn es um Finanzangelegenheiten, also z.B. Geldanlagen, geht.

- Ich entscheide in meinem Haushalt allein.
- Ich entscheide zusammen mit meinem Partner / meiner Partnerin.
- Ich entscheide nicht, sondern jemand anderes.
- Keine Angabe

Frage 2: Geben Sie bitte an, in welche der folgenden Anlageformen Sie derzeit Ihr Geld angelegt haben. (mehrere Antworten möglich)

- Sparbuch
- Sparplan / Sparvertrag
- Sparbrief
- Festgeld
- Festverzinsliche Wertpapiere (z.B. Pfandbriefe, Schatzbriefe, Obligationen)
- Tagesgeldkonto
- Aktien
- Optionsscheine, spekulative Wertpapiere
- Zertifikate
- Aktienfonds (
- Exchange Traded Funds (ETFs)
- Rentenfonds
- Gemischte Fonds
- Offene Immobilienfonds
- Geschlossene Fonds (z.B. Immobilien, Schiffe, alternative Energien, Film, Flugzeug)
- In keiner der aufgeführten Geldanlageformen
- Keine Angabe

Alter: Geben Sie bitte Ihr Alter in Jahren an. _____ Jahre

Geschlecht: Sind Sie ... ?

□ männlich

□ weiblich

Frage 4: Geben Sie bitte an, in welchem Bundesland Ihr Erstwohnsitz liegt.

□ Baden-Württemberg

□ Bayern

□ Berlin

□ Brandenburg

□ Bremen

□ Hamburg

□ Hessen

□ Mecklenburg-Vorpommern

□ Niedersachsen

□ Nordrhein-Westfalen

□ Rheinland-Pfalz

□ Saarland

□ Sachsen

□ Sachsen-Anhalt

□ Schleswig-Holstein

□ Thüringen

Frage 5: Geben Sie bitte an, wie viele Autos Ihrem Haushalt zur Verfügung stehen. _____ Autos

Frage 6: Geben Sie bitte an, wie viele Kilometer Sie selbst etwa durchschnittlich pro Jahr privat mit diesem/n Auto/s fahren. Wenn Sie es nicht genau wissen, schätzen Sie bitte. _____ Kilometer

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Frage 7: Geben Sie bitte an, wie oft Sie in den letzten 3 Jahren eine Flugreise unternommen haben. Bitte zählen Sie dabei jeweils Hin- und Rückflug zusammengenommen als einen Flug. Wenn Sie es nicht genau wissen, schätzen Sie bitte. _____ Flugreisen

---

Frage 8: Geben Sie bitte an, wie häufig Sie in den letzten 3 Jahren private Reisen (ab zwei Tagen) unternommen haben. Wenn Sie es nicht genau wissen, schätzen Sie bitte. _____ Reisen

---

Frage 9: Geben Sie bitte an, wie stark Sie die folgenden Kriterien mit den Begriffen „Nachhaltigkeit“ oder „nachhaltige Entwicklung“ verbinden.

	Sehr schwach	Eher schwach	Weder stark noch schwach	Eher stark	Sehr stark	Keine Angabe
Ökologische Kriterien	☐	☐	☐	☐	☐	☐
Soziale Kriterien	☐	☐	☐	☐	☐	☐
Ethische Kriterien	☐	☐	☐	☐	☐	☐
Wirtschaftliche Kriterien	☐	☐	☐	☐	☐	☐

Frage 10: Geben Sie bitte an, wie wichtig für Sie das Thema Nachhaltigkeit ist.

Sehr unwichtig	Eher unwichtig	Weder wichtig noch unwichtig	Eher wichtig	Sehr wichtig	Keine Angabe
☐	☐	☐	☐	☐	☐

Frage 11: Geben Sie bitte an, inwiefern sich Ihrer Meinung nach ökologische, soziale oder ethisch motivierte Maßnahmen von Unternehmen langfristig auf den wirtschaftlichen Erfolg dieser Unternehmen auswirken.

	Sehr negativ	Eher negativ	Weder positiv noch negativ	Eher positiv	Sehr positiv	Keine Angabe
Ökologische Maßnahmen	☐	☐	☐	☐	☐	☐
Soziale Maßnahmen	☐	☐	☐	☐	☐	☐
Ethische Maßnahmen	☐	☐	☐	☐	☐	☐

Frage 12: Geben Sie bitte an, wie stark Sie bei folgenden privaten Aktivitäten und Verhaltensweisen ökologische Kriterien beachten.

	Sehr schwach	Eher schwach	Weder stark noch schwach	Eher stark	Sehr stark	Keine Angabe
Wahl eines Verkehrsmittels (z.B. Auto, öffentliche Verkehrsmittel) für eine bestimmte Strecke (z.B. Weg zur Arbeit, Urlaubsreise)	☐	☐	☐	☐	☐	☐
Häufigkeit der Nutzung des/der Autos in Ihrem Haushalt	☐	☐	☐	☐	☐	☐
Häufigkeit von privaten Reisen (ab zwei Tagen)	☐	☐	☐	☐	☐	☐
Häufigkeit von Flügen	☐	☐	☐	☐	☐	☐
Wahl eines Urlaubsziels	☐	☐	☐	☐	☐	☐
Häufigkeit des Konsums von Fleisch- und Milchprodukten	☐	☐	☐	☐	☐	☐

Frage 13: Beziehen Sie in Ihrem Haushalt Ökostrom?

□ Ja

□ Nein

□ Keine Angabe

Frage 14: Geben Sie bitte an, wie stark Sie beim Kauf folgender Produkte ökologische Kriterien bei der Herstellung, dem Gebrauch und der Entsorgung dieser Produkte (z.B. geringer Energieverbrauch, geringe Belastung von Luft und Boden, umweltfreundliche Bestandteile) beachten.

	Sehr schwach	Eher schwach	Weder stark noch schwach	Eher stark	Sehr stark	Keine Angabe
Kauf von Lebensmitteln	□	□	□	□	□	□
Kauf von Kleidung	□	□	□	□	□	□
Kauf von elektronischen Geräten (z.B. Waschmaschine, Kühlschrank, Mobiltelefon)	□	□	□	□	□	□
Kauf eines Autos	□	□	□	□	□	□

Frage 15: Geben Sie bitte an, wie stark Sie beim Kauf folgender Produkte soziale oder ethische Kriterien bei der Herstellung und dem Vertrieb dieser Produkte (z.B. Einhaltung von Arbeitnehmer- und Menschenrechten, fairer Handel, Verzicht von unmoralischen Geschäftsmethoden) beachten.

	Sehr schwach	Eher schwach	Weder stark noch schwach	Eher stark	Sehr stark	Keine Angabe
Kauf von Lebensmitteln	□	□	□	□	□	□
Kauf von Kleidung	□	□	□	□	□	□
Kauf von elektronischen Geräten (z.B. Waschmaschine, Kühlschrank, Mobiltelefon)	□	□	□	□	□	□
Kauf eines Autos	□	□	□	□	□	□

Frage 16: Geben Sie bitte an, in welche der folgenden Anlageformen Sie in der Vergangenheit einmal Ihr Geld angelegt haben. (mehrere Antworten möglich)

- Aktien
- Optionsscheine, spekulative Wertpapiere
- Zertifikate
- Aktienfonds
- Exchange Traded Funds (ETFs)
- Rentenfonds
- Gemischte Fonds
- Offene Immobilienfonds
- Geschlossene Fonds (z.B. Immobilien, Schiffe, alternative Energien, Film, Flugzeug)
- In keiner der aufgeführten Geldanlageformen
- Keine Angabe

Frage 17: Geben Sie bitte an, über welche der folgenden Anlageformen Sie sich schon einmal ausführlich informiert haben. (mehrere Antworten möglich)

- Aktien
- Optionsscheine, spekulative Wertpapiere
- Zertifikate
- Aktienfonds
- Exchange Traded Funds (ETFs)
- Rentenfonds
- Gemischte Fonds
- Offene Immobilienfonds
- Geschlossene Fonds (z.B. Immobilien, Schiffe, alternative Energien, Film, Flugzeug)
- Über keine der aufgeführten Geldanlageformen
- Keine Angabe

Frage 18: Geben Sie bitte an, wie Sie sich informieren, bevor Sie in eine Geldanlage investieren. (mehrere Antworten möglich)

- ☐ Durch Gespräche mit einem Bankberater
- ☐ Durch Gespräche mit einem nicht bei einer Bank tätigen Anlageberater
- ☐ Durch Gespräche bei einer Verbraucherzentrale
- ☐ Durch Gespräche mit Verwandten / Bekannten / Freunden
- ☐ Durch eine Zeitschrift der Stiftung Warentest
- ☐ Durch einschlägige Finanzzeitschriften
- ☐ Durch einschlägige Internetseiten
- ☐ Durch Tageszeitungen
- ☐ Andere Informationsquellen: _____
- ☐ Keine Angabe

Frage 19: Geben Sie bitte an, wie stark Sie bei der Auswahl von Geldanlagen ökologische Kriterien beachten.

Sehr schwach	Eher schwach	Weder stark noch schwach	Eher stark	Sehr stark	Keine Angabe
☐	☐	☐	☐	☐	☐

Frage 20: Geben Sie bitte an, wie stark Sie bei der Auswahl von Geldanlagen soziale oder ethische Kriterien beachten.

Sehr schwach	Eher schwach	Weder stark noch schwach	Eher stark	Sehr stark	Keine Angabe
☐	☐	☐	☐	☐	☐

Frage 21: Geben Sie bitte an, wie sich Ihrer Meinung nach Geldanlagen generell ökologisch auswirken.

Sehr negativ	Eher negativ	Weder positiv noch negativ	Eher positiv	Sehr positiv	Keine Angabe
☐	☐	☐	☐	☐	☐

Frage 22: Geben Sie bitte an, wie sich Ihrer Meinung nach Geldanlagen generell sozial oder ethisch auswirken.

Sehr negativ	Eher negativ	Weder positiv noch negativ	Eher positiv	Sehr positiv	Keine Angabe
☐	☐	☐	☐	☐	☐

Im Folgenden verstehen wir unter nachhaltige Geldanlagen solche Anlagen, bei deren Zusammenstellung oder Konstruktion ökologische, soziale und/oder ethische Kriterien zusätzlich zu finanziellen Kriterien einbezogen werden.

Frage 23: Geben Sie bitte an, wie stark Sie sich für nachhaltige Geldanlagen interessieren.

Sehr schwach	Eher schwach	Weder stark noch schwach	Eher stark	Sehr stark	Keine Angabe
☐	☐	☐	☐	☐	☐

Frage 24: Geben Sie bitte an, welche der folgenden Aussagen zu nachhaltigen Geldanlagen für Sie zutrifft.

☐ Ich besitze derzeit nachhaltige Geldanlagen und werde in den kommenden drei Jahren weiterhin in nachhaltige Geldanlagen investieren

☐ Ich besitze derzeit nachhaltige Geldanlagen, werde aber in den kommenden drei Jahren nicht mehr in nachhaltige Geldanlagen investieren

☐ Ich besitze derzeit keine nachhaltigen Geldanlagen, werde aber in den kommenden drei Jahren in nachhaltige Geldanlagen investieren

☐ Ich besitze derzeit keine nachhaltigen Geldanlagen und werde auch in den kommenden drei Jahren nicht in nachhaltige Geldanlagen investieren

Frage 25: Geben Sie bitte an, wie hoch derzeit der prozentuale Anteil von nachhaltigen Geldanlagen an der Summe aller Ihrer Geldanlagen ist. (nur wenn erste oder zweite Antwort bei Frage 24 gewählt wurde)

Über 0% bis 20%	Über 20% bis 40%	Über 40% bis 60%	Über 60% bis 80%	Über 80% bis unter 100%	100%
☐	☐	☐	☐	☐	☐

Frage 26: Geben Sie bitte an, wie hoch derzeit der prozentuale Anteil der folgenden Formen von nachhaltigen Geldanlagen an der Summe aller Ihrer nachhaltigen Geldanlagen ist. (nur wenn erste oder zweite Antwort bei Frage 24 gewählt wurde. Summe darf nicht 100% übersteigen)

	0%	Über 0% bis 20%	Über 20% bis 40%	Über 40% bis 60%	Über 60% bis 80%	Über 80% bis unter 100%	100%
Nachhaltige Aktienfonds	☐	☐	☐	☐	☐	☐	☐
Nachhaltige festverzinsliche Geldanlagen	☐	☐	☐	☐	☐	☐	☐

Frage 27: Geben Sie bitte an, wie hoch in den kommenden drei Jahren voraussichtlich der prozentuale Anteil der geplanten nachhaltigen Geldanlagen an der Summe aller Ihrer Geldanlagen sein wird.

Über 0% bis 20%	Über 20% bis 40%	Über 40% bis 60%	Über 60% bis 80%	Über 80% bis unter 100%	100%
☐	☐	☐	☐	☐	☐

Frage 28: Geben Sie bitte an, wie hoch in den kommenden drei Jahren voraussichtlich der prozentuale Anteil der folgenden Formen von geplanten nachhaltigen Geldanlagen an der Summe aller Ihrer nachhaltigen Geldanlagen sein wird. (Summe darf nicht 100% übersteigen)

	0%	Über 0% bis 20%	Über 20% bis 40%	Über 40% bis 60%	Über 60% bis 80%	Über 80% bis unter 100%	100%
Nachhaltige Aktienfonds	☐	☐	☐	☐	☐	☐	☐
Nachhaltige festverzinsliche Geldanlagen	☐	☐	☐	☐	☐	☐	☐

Frage 29: Geben Sie bitte an, wie stark Sie den folgenden Aussagen bezüglich nachhaltigen Geldanlagen zustimmen.

	Stimme überhaupt nicht zu	Stimme eher schwach zu	Stimme weder stark noch schwach zu	Stimme eher stark zu	Stimme voll und ganz zu	Keine Angabe
Mein Umfeld (z.B. Familie, Freunde, Kollegen) erwartet von mir, in nachhaltige Geldanlagen anzulegen.	☐	☐	☐	☐	☐	☐
Die Gesellschaft erwartet von mir, in nachhaltige Geldanlagen anzulegen.	☐	☐	☐	☐	☐	☐
Ich fühle mich verantwortlich für eine nachhaltige Entwicklung und möchte durch die Anlage in nachhaltige Geldanlagen dazu beitragen.	☐	☐	☐	☐	☐	☐
Ich lege in nachhaltige Geldanlagen an, um anderen ein Vorbild zu sein.	☐	☐	☐	☐	☐	☐
Es verschafft mir ein gutes Gefühl, wenn ich in nachhaltige Geldanlagen anlege.	☐	☐	☐	☐	☐	☐
Die Politik tut zu wenig für die Förderung von nachhaltigen Geldanlagen.	☐	☐	☐	☐	☐	☐
In meinem Umfeld (z.B. Familie, Freunde, Kollegen) legt niemand in nachhaltige Geldanlagen an.	☐	☐	☐	☐	☐	☐
Ich weiß zu wenig über nachhaltige Geldanlagen.	☐	☐	☐	☐	☐	☐
Durch die Anlage in nachhaltigen Geldanlagen kann ich allein nichts zu einer nachhaltigen Entwicklung beitragen.	☐	☐	☐	☐	☐	☐
Es liegt nicht in meiner Verantwortung, durch die Anlage in nachhaltigen Geldanlagen	☐	☐	☐	☐	☐	☐

etwas für eine nachhaltige Entwicklung zu tun.						
Die Suche nach nachhaltigen Geldanlagen ist sehr zeitaufwändig.	☐	☐	☐	☐	☐	☐
Andere, die selber nichts für eine nachhaltige Entwicklung durch die Anlage in nachhaltigen Geldanlagen tun, würden von meinen Maßnahmen profitieren.	☐	☐	☐	☐	☐	☐

Frage 30: Geben Sie bitte an, wie stark Sie den folgenden Aussagen bezüglich der Gründe, aus denen Sie derzeit oder in den kommenden drei Jahren nicht noch stärker in nachhaltige Geldanlagen investieren, zustimmen. (nur wenn erste, zweite oder dritte Antwort bei Frage 24 gewählt wurde)

	Stimme überhaupt nicht zu	Stimme eher schwach zu	Stimme weder stark noch schwach zu	Stimme eher stark zu	Stimme voll und ganz zu	Keine Angabe
Ich fühle mich zu wenig über nachhaltige Geldanlagen informiert.	☐	☐	☐	☐	☐	☐
Das Angebot an nachhaltigen Geldanlagen reicht mir nicht aus.	☐	☐	☐	☐	☐	☐
Nachhaltige Geldanlagen sind mir zu intransparent.	☐	☐	☐	☐	☐	☐
Nachhaltige Geldanlagen sind mir zu riskant.	☐	☐	☐	☐	☐	☐
Nachhaltige Geldanlagen sind mir nicht rentabel genug.	☐	☐	☐	☐	☐	☐
Die Anlagekriterien für nachhaltige Geldanlagen sind mir nicht klar.	☐	☐	☐	☐	☐	☐
Ich glaube nicht, dass nachhaltige Geldanlagen zur Lösung ökologischer, sozialer oder ethischer Probleme beitragen.	☐	☐	☐	☐	☐	☐
Meine Bank hat mir bisher noch keine nachhaltigen Geldanlagen angeboten.	☐	☐	☐	☐	☐	☐
Ich vertraue nicht darauf, dass	☐	☐	☐	☐	☐	☐

Anbieter von nachhaltigen Geldanlagen den Nachhaltigkeitsrichtlinien folgen, die sie in ihren Anlageinformationen vertreten.	

Frage 31: Geben Sie bitte an, wie sich nachhaltige Geldanlagen verändern müssten, damit Sie noch stärker in diese Geldanlagen investieren würden (Stichpunkte). (nur wenn erste, zweite oder dritte Antwort bei Frage 24 gewählt wurde)

Vorschlag: _____

□ Keine Angabe

Frage 32: Geben Sie bitte an, wie stark Sie den folgenden Aussagen bezüglich der Gründe, aus denen Sie nicht in nachhaltige Geldanlagen investieren, zustimmen. (nur wenn vierte Antwort bei Frage 24 gewählt wurde)

	Stimme überhaupt nicht zu	Stimme eher schwach zu	Stimme weder stark noch schwach zu	Stimme eher stark zu	Stimme voll und ganz zu	Keine Angabe
Ich fühle mich zu wenig über nachhaltige Geldanlagen informiert.	□	□	□	□	□	□
Das Angebot an nachhaltigen Geldanlagen reicht mir nicht aus.	□	□	□	□	□	□
Nachhaltige Geldanlagen sind mir zu intransparent.	□	□	□	□	□	□
Nachhaltige Geldanlagen sind mir zu riskant.	□	□	□	□	□	□
Nachhaltige Geldanlagen sind mir nicht rentabel genug.	□	□	□	□	□	□
Die Anlagekriterien für nachhaltige Geldanlagen sind mir nicht klar.	□	□	□	□	□	□
Ich glaube nicht, dass nachhaltige Geldanlagen zur Lösung ökologischer, sozialer oder ethischer Probleme beitragen.	□	□	□	□	□	□
Meine Bank hat mir bisher noch keine nachhaltigen Geldanlagen	□	□	□	□	□	□

angeboten. Ich vertraue nicht darauf, dass Anbieter von nachhaltigen Geldanlagen den Nachhaltigkeitsrichtlinien folgen, die sie in ihren Anlageinformationen vertreten.	☐	☐	☐	☐	☐	☐

Frage 33: Geben Sie bitte an, wie sich nachhaltige Geldanlagen verändern müssten, damit Sie in nachhaltige Geldanlagen investieren (Stichpunkte). (nur wenn vierte Antwort bei Frage 24 gewählt wurde)
Vorschlag: _____

☐ Keine Angabe

Frage 34: Geben Sie bitte an, wie hoch bei den folgenden Banken Ihr Vertrauen ist, dass die finanziellen Mittel bei nachhaltigen Geldanlagen auch wirklich nachhaltig eingesetzt werden.

	Sehr gering	Eher gering	Weder hoch noch gering	Eher hoch	Sehr hoch	Keine Angabe
Deutsche Bank	☐	☐	☐	☐	☐	☐
Sparkasse	☐	☐	☐	☐	☐	☐
Volks- und Raiffeisenbanken	☐	☐	☐	☐	☐	☐
Commerzbank	☐	☐	☐	☐	☐	☐
ING-DiBa	☐	☐	☐	☐	☐	☐
.comdirect	☐	☐	☐	☐	☐	☐
GLS Bank	☐	☐	☐	☐	☐	☐
Triodos	☐	☐	☐	☐	☐	☐
EthikBank	☐	☐	☐	☐	☐	☐
UmweltBank	☐	☐	☐	☐	☐	☐

Frage 35: Geben Sie bitte Ihre Einschätzung zur durchschnittlichen Höhe der Verzinsung oder Rendite bei nachhaltigen Geldanlagen im Vergleich zu konventionellen Geldanlagen an.

☐ Die durchschnittliche Verzinsung oder Rendite ist bei nachhaltigen Geldanlagen viel geringer.

□ Die durchschnittliche Verzinsung oder Rendite ist bei nachhaltigen Geldanlagen eher geringer.

□ Die durchschnittliche Verzinsung oder Rendite ist bei nachhaltigen Geldanlagen weder höher noch geringer.

□ Die durchschnittliche Verzinsung oder Rendite ist bei nachhaltigen Geldanlagen eher höher.

□ Die durchschnittliche Verzinsung oder Rendite ist bei nachhaltigen Geldanlagen viel höher.

□ Keine Angabe

Frage 36: Geben Sie bitte Ihre Einschätzung zur durchschnittlichen Höhe der langfristigen Renditen nach Kosten speziell bei nachhaltigen Aktienfonds im Vergleich zu konventionellen Aktienfonds an.

□ Die durchschnittlichen langfristigen Renditen nach Kosten sind bei nachhaltigen Aktienfonds viel geringer.

□ Die durchschnittlichen langfristigen Renditen nach Kosten sind bei nachhaltigen Aktienfonds eher geringer.

□ Die durchschnittlichen langfristigen Renditen nach Kosten sind bei nachhaltigen Aktienfonds weder höher noch geringer.

□ Die durchschnittlichen langfristigen Renditen nach Kosten sind bei nachhaltigen Aktienfonds eher höher.

□ Die durchschnittlichen langfristigen Renditen nach Kosten sind bei nachhaltigen Aktienfonds viel höher.

□ Keine Angabe

Frage 37: Geben Sie bitte Ihre Einschätzung zur durchschnittlichen Höhe der Gebühren bei nachhaltigen Geldanlagen im Vergleich zu konventionellen Geldanlagen an.

□ Die durchschnittlichen Gebühren sind bei nachhaltigen Geldanlagen viel geringer.

□ Die durchschnittlichen Gebühren sind bei nachhaltigen Geldanlagen eher geringer.

□ Die durchschnittlichen Gebühren sind bei nachhaltigen Geldanlagen weder höher noch geringer.

□ Die durchschnittlichen Gebühren sind bei nachhaltigen Geldanlagen eher höher.

□ Die durchschnittlichen Gebühren sind bei nachhaltigen Geldanlagen viel höher.

□ Keine Angabe

Frage 38: Geben Sie bitte Ihre Einschätzung zur durchschnittlichen Höhe des Risikos bei nachhaltigen Geldanlagen im Vergleich zu konventionellen Geldanlagen an.

□ Das durchschnittliche Risiko ist bei nachhaltigen Geldanlagen viel geringer.

□ Das durchschnittliche Risiko ist bei nachhaltigen Geldanlagen eher geringer.

□ Das durchschnittliche Risiko ist bei nachhaltigen Geldanlagen weder höher noch geringer.

□ Das durchschnittliche Risiko ist bei nachhaltigen Geldanlagen eher höher.

□ Das durchschnittliche Risiko ist bei nachhaltigen Geldanlagen viel höher.

□ Keine Angabe

(Einleitende Erklärung für das Auswahlexperiment in Bezug auf festverzinsliche Geldanlagen)

Auf den folgenden sechs Seiten werden Ihnen jeweils vier verschiedene festverzinsliche dreijährige Geldanlagen gezeigt, die sich hinsichtlich bestimmter Eigenschaften unterscheiden. Geben Sie bitte in jeder dieser sechs Entscheidungssituationen an, welche der vier Geldanlagen Ihnen so attraktiv erscheint, dass Sie sie am ehesten erwerben würden. Dabei ist es möglich, dass einige der angezeigten Geldanlagen mit den angegebenen Eigenschaften derzeit nicht von Banken angeboten werden. Das sollte Sie aber nicht stören. Stellen Sie sich einfach vor, dass es diese Geldanlagen wirklich gibt. Nehmen Sie bei Ihrer Wahlentscheidung bitte zudem an, dass die Geldanlagen jeweils hinsichtlich aller nicht angezeigten Eigenschaften (wie z.B. Anlageform, vollständige Einlagensicherung etc.) vollkommen identisch sind. Nachfolgend werden einige der verwendeten Eigenschaften der festverzinslichen dreijährigen Geldanlagen kurz erläutert:

Jährlicher nominaler Zinssatz:
Die einzelnen Geldanlagen unterscheiden sich in Bezug auf den festgeschriebenen jährlichen nominalen Zinssatz über die Laufzeit von drei Jahren.

Nachhaltigkeitskriterien:
Die einzelnen Geldanlagen unterscheiden sich darin, ob bei deren Konstruktion ökologische, soziale und/oder ethische Kriterien zusätzlich zu finanziellen Kriterien berücksichtigt werden. Solche nachhaltigen Geldanlagen unterscheiden sich zudem darin, ob sie ein Nachhaltigkeitszertifikat erhalten haben. In diesem Fall wird die Berücksichtigung der Nachhaltigkeitskriterien von einer unabhängigen Organisation geprüft und bestätigt.

Transparenzlogo:
Die einzelnen Geldanlagen unterscheiden sich darin, ob sie ein Transparenzlogo erhalten haben. Solche Geldanlagen zeichnen sich dadurch aus, dass ausführliche Informationen über die jeweilige Anlagestrategie (gegebenenfalls inklusive der verwendeten Nachhaltigkeitskriterien) veröffentlicht werden. Geldanlagen mit Transparenzlogo unterscheiden sich zudem darin, ob das Logo von einer staatlichen Behörde oder von einer Nichtregierungsorganisation (NGO) ausgestellt wird.

Anbieter:
Die einzelnen Geldanlagen unterscheiden sich darin, ob sie von einer Großbank, von einer Sparkasse, von einer Volks- oder Raiffeisenbank, von einer Direktbank oder (im Falle der Berücksichtigung von

Nachhaltigkeitskriterien) von einer Nachhaltigkeitsbank angeboten werden. Direktbanken sind Banken, die Bankgeschäfte ohne eigenes Filialnetz anbieten.

(Jeder Teilnehmer trifft im Anschluss sechs aufeinanderfolgende Investitionsentscheidungen.)

Nachfrage: Bitte geben Sie an, wie sicher Sie sich sind, dass Sie die ausgewählte Geldanlage im Fall einer wirklichen Entscheidungssituation tatsächlich erwerben würden. (nach jeder der jeweils sechs Entscheidungen pro Person)

Sehr unsicher	Eher unsicher	Weder sicher noch unsicher	Eher sicher	Sehr sicher	Keine Angabe
☐	☐	☐	☐	☐	☐

(Einleitende Erklärung für das Auswahlexperiment in Bezug auf Aktienfonds)

Nachdem Sie zuvor Wahlentscheidungen zwischen verschiedenen festverzinslichen dreijährigen Geldanlagen getroffen haben, werden Ihnen auf den folgenden acht Seiten jeweils vier verschiedene Aktienfonds gezeigt, die sich hinsichtlich bestimmter Eigenschaften unterscheiden. Geben Sie bitte in jeder dieser acht Entscheidungssituationen an, welcher der vier Aktienfonds Ihnen so attraktiv erscheint, dass Sie ihn am ehesten erwerben würden. Dabei ist es möglich, dass einige der angezeigten Aktienfonds mit den angegebenen Eigenschaften derzeit nicht auf dem Kapitalmarkt angeboten werden. Das sollte Sie aber erneut nicht stören. Stellen Sie sich einfach vor, dass es diesen Aktienfonds wirklich gibt. Nehmen Sie bei Ihrer Wahlentscheidung bitte zudem an, dass die Aktienfonds jeweils hinsichtlich aller nicht angezeigten Eigenschaften (wie z.B. Fondsvolumen, Fondsalter etc.) vollkommen identisch sind. Nachfolgend werden einige der verwendeten Eigenschaften der Aktienfonds kurz erläutert:

Nettorendite im letzten Jahr:
Die einzelnen Aktienfonds unterscheiden sich in Bezug auf die Nettorendite (Rendite abzüglich aller Kosten und Gebühren bis auf Ausgabeaufschläge) im letzten Jahr.

Durchschnittliche jährliche Nettorendite in den letzten fünf Jahren:
Die einzelnen Aktienfonds unterscheiden sich in Bezug auf die Nettorendite (Rendite abzüglich aller Kosten und Gebühren bis auf Ausgabeaufschläge) in den letzten fünf Jahren.

Höhe des Ausgabeaufschlags:
Die einzelnen Aktienfonds unterscheiden sich in Bezug auf die Höhe der einmaligen Ausgabegebühr, gemessen in Prozent der angelegten Geldsumme.

Nachhaltigkeitskriterien:
Die einzelnen Aktienfonds unterscheiden sich darin, ob bei deren Konstruktion ökologische, soziale und/oder

ethische Kriterien zusätzlich zu finanziellen Kriterien berücksichtigt werden. Solche nachhaltigen Aktienfonds unterscheiden sich zudem darin, ob sie ein Nachhaltigkeitszertifikat erhalten haben. In diesem Fall wird die Berücksichtigung der Nachhaltigkeitskriterien von einer unabhängigen Organisation geprüft und bestätigt.

Transparenzlogo:
Die einzelnen Aktienfonds unterscheiden sich darin, ob sie ein Transparenzlogo erhalten haben. Solche Aktienfonds zeichnen sich dadurch aus, dass ausführliche Informationen über die jeweilige Anlagestrategie (gegebenenfalls inklusive der verwendeten Nachhaltigkeitskriterien) veröffentlicht werden. Aktienfonds mit Transparenzlogo unterscheiden sich zudem darin, ob das Logo von einer staatlichen Behörde oder von einer Nichtregierungsorganisation (NGO) ausgestellt wird.

(Jeder Teilnehmer trifft im Anschluss acht aufeinanderfolgende Investitionsentscheidungen.)

Nachfrage: Bitte geben Sie an, wie sicher Sie sich sind, dass Sie den ausgewählten Aktienfonds im Fall einer wirklichen Entscheidungssituation tatsächlich erwerben würden. (nach jeder der jeweils acht Entscheidungen pro Person)

Sehr unsicher	Eher unsicher	Weder sicher noch unsicher	Eher sicher	Sehr sicher	Keine Angabe
□	□	□	□	□	□

Verständnisfrage: Bitte geben Sie an, ob Sie die vorhergehenden Auswahlsituationen bzw. die Beschreibung der Ausgangssituation verständlich fanden. Falls nein, schreiben Sie bitte Ihre Anmerkungen in das folgende Kommentarfeld: _____

□ Ich fand alles verständlich.

Frage 39: Geben Sie bitte an, wie viele Personen derzeit in Ihrem Haushalt leben. _____ Personen

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Frage 41: Geben Sie bitte Ihren Familienstand an.

□ Ledig

□ Zusammenlebend

□ Verheiratet

□ Geschieden oder getrennt lebend

□ Verwitwet

□ Keine Angabe

Frage 42: Geben Sie bitte Anzahl der in Ihrem Haushalt lebenden Kinder unter 18 Jahren an. _____ Kinder

Frage 43: Geben Sie bitte Ihren höchsten Bildungsabschluss an.

- Kein Schulabschluss
- Haupt- / Volksschulabschluss
- Mittlere Reife, Realschulabschluss
- Fachhochschulreife, Abitur
- Bachelor Abschluss / Fachhochschulabschluss
- Master Abschluss / Diplom
- Promotion / Habilitation
- Anderer Schulabschluss (Eingabe): _____
- Keine Angabe

Frage 44: Geben Sie bitte an, welche berufliche Tätigkeit Sie ausüben. (Mehrfachangabe möglich)

- Schüler / Lehrling
- Student
- Auszubildender
- Vorübergehend ohne Beschäftigung
- Leitender Angestellter
- Hausmann/-frau
- Angestellter
- Arbeiter
- Beamter
- Selbständiger / Unternehmensinhaber
- Renter / Pensionär
- Andere Tätigkeit, und zwar: _____
- Keine Angabe

Frage 45: Geben Sie bitte das monatliche Nettoeinkommen Ihres Haushalts an (Einkommen nach Steuern und Sozialversicherungsbeiträgen):

- Unter 500 €
- 500 € bis unter 1.000 €
- 1.000 € bis unter 1.500 €
- 1.500 € bis unter 2.000 €
- 2.000 € bis unter 3.000 €
- 3.000 € bis unter 4.500 €
- 4.500 € bis unter 6.000 €
- 6.000 € bis unter 7.500 €
- 7.500 € bis unter 10.000 €
- 10.000 € oder mehr
- Keine Angabe

Frage 46: Geben Sie bitte für Ihren Haushalt die Höhe des Geldvermögens an.

- Unter 500 €
- 500 € bis unter 2.000 €
- 2.000 € bis unter 5.000 €
- 5.000 € bis unter 10.000 €
- 10.000 € bis unter 20.000 €
- 20.000 € bis unter 50.000 €
- 50.000 € bis unter 100.000 €
- 100.000 € bis unter 250.000 €
- 250.000 € oder mehr
- Keine Angabe

Frage 47: Geben Sie bitte an, welcher Partei Sie generell am ehesten zuneigen (auch wenn Sie gelegentlich eine andere Partei wählen sollten).

- CDU / CSU
- SPD
- FDP
- Bündnis 90 / Die Grünen
- Die Linke
- AfD
- Piratenpartei
- Andere Partei
- Keine Angabe

Frage 49: Geben Sie bitte an, welcher Religionsgemeinschaft Sie angehören.

- Römisch-katholische Kirche
- Evangelische Kirchen
- Islam
- Orthodoxe Kirchen
- Neuapostolische Kirche
- Buddhismus
- Judentum
- Zeugen Jehovas
- Hinduismus
- Andere Religionsgemeinschaft
- Konfessionslos
- Keine Angabe

Frage 48: Geben Sie bitte an, als wie stark religiös Sie sich einschätzen. (nur wenn Konfession gewählt wurde)

Sehr schwach	Eher schwach	Weder stark noch	Eher stark	Sehr stark	Keine Angabe

		schwach			
□	□	□	□	□	□

Frage 50: Geben Sie bitte an, an wie vielen Tagen in der Woche Sie durchschnittlich Ihrer Glaubensrichtung aktiv nachgehen (z.B. beten). _____ (nur wenn Konfession gewählt wurde)

□ Keine Angabe

Frage 51: Sind Sie Mitglied in einer Gruppe oder Organisation, die sich für die Erhaltung und den Schutz von Umwelt und Natur einsetzt?

□ Ja

□ Nein

□ Keine Angabe

Frage 52: Engagieren Sie sich ehrenamtlich?

□ Ja

□ Nein

□ Keine Angabe

Frage 53: Geben Sie bitte an, wie viele Stunden Sie im Monat durchschnittlich in diese ehrenamtliche Tätigkeit investieren. _____

□ Keine Angabe

Frage 54: Geben Sie bitte an, in welchen Bereichen Sie ehrenamtlich tätig sind.

□ Freizeit

□ Kinder / Jugend

□ Kirche

□ Sport

□ Soziales

□ Kultur

□ Lokales

□ Engagement für Ältere

□ Politik

□ Umwelt- und Tierschutz

□ Sonstiges

□ Keine Angabe

Frage 55: Geben Sie bitte die Postleitzahl Ihres Wohnortes an: _____

Frage 56: Zum Schluss möchten wir Sie noch nach Ihrer Zufriedenheit mit Ihrem Leben insgesamt fragen. Antworten Sie bitte anhand der folgenden Skala, bei der "0" ganz und gar unzufrieden, "10" ganz und gar zufrieden bedeutet. Wie zufrieden sind Sie gegenwärtig, alles in allem, mit Ihrem Leben?

Ganz und gar unzufrieden 0	1	2	3	4	5	6	7	8	9	Ganz und gar zufrieden 10
□	□	□	□	□	□	□	□	□	□	□

Und was glauben Sie, wie wird es wohl in einem Jahr sein?

Ganz und gar unzufrieden 0	1	2	3	4	5	6	7	8	9	Ganz und gar zufrieden 10
□	□	□	□	□	□	□	□	□	□	□