

Individual and Regional Christian Religion and the Consideration of Sustainable Criteria in Consumption and Investment Decisions: An Exploratory Econometric Analysis

Gunnar Gutsche¹

Received: 20 December 2016 / Accepted: 8 August 2017 / Published online: 23 August 2017
© Springer Science+Business Media B.V. 2017

Abstract This study aims to shed light on the relationship between individual and regional Christian religion (and religiosity) and individual sustainable behaviors in an exploratory manner, with a special focus on sustainable consumption and investment decisions. To this end, we econometrically analyze online representative survey data that contains information on the self-reported importance of the consideration of ecological and social/ethical criteria in the context of a large variety of individual behaviors. The target group are financial decisions makers in German households, i.e., important actors in the largest economy in Europe. Results of the econometric analysis suggest that Christian religion is positively related to a variety of (self-reported) ecological and social/ethical activities. Our findings empirically support explanations postulating a positive relationship between Christian religion and environmental behavior, such as the stewardship hypothesis, rather than opposite theories like White's (Science 155 (3767):1203–1207, 1967) dominion hypothesis. Particularly, we find that both individual and regional measures for Christian religion positively affect various behaviors emphasizing the importance of individual and contextual norms for individual behavior. Hence, we provide empirical evidence for the importance of Christian religion for another country than the USA, which is typically in the focus of similar studies. Our 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 · Consumption and investment decisions · Household behavior · Christian religion · Political orientation

JEL Classification D12 · D14 · G11 · Q56 · Z12

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 in 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 (SRIs). 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 comprises various and often related factors (e.g., Bénabou and

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

¹ Department of Economics, University of Kassel, Nora-Platiel-Str. 5, 34109 Kassel, Germany

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 socioeconomic or sociodemographic 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, 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 (e.g., Akerlof and Kranton 2000; Axsen et al. 2012; Stern et al. 1995). 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; Benjamin et al. 2016). 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 and 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, nonconforming persons might feel guilty, which decreases their utility (Delmas and Lessem 2014). These concepts were also transferred to individual contributions to a public good. Influenced by Akerlof and Kranton (2000), Benjamin et al. (2010, 2016) formally consider how individual affiliation to a social category, such as a religious affiliation, influences the amount an individual contributes to a public good. Again, deviation from the prevailing norms of the social category yields disutility. Similarly, the formal model by Czajkowski et al. (2017) captures how one's own self-image and the expectation of others influence individual consumption of a private and a public good. Hence, this model assumes that both the deviation from one's own norms and the deviation from other's expectations lead to

utility loss due to cognitive dissonance. In their subsequent empirical analysis, they indeed find that a moral motivation influences individuals' recycling behavior. Also, several previous empirical studies on sustainable behavior support the importance of social norms within categories or communities, 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). One 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).

One potentially important, but often neglected mean of enforcing social norms, is religion (Arruñada 2010), which can be defined 'as any shared set of beliefs, activities, and institutions premised upon faith in supernatural forces' (Iannaccone 1998, p. 1466). As enforcing social norms by religion can be conducted via first- and second-party (and also third) enforcement (Arruñada 2010), it can be well connected to the above-mentioned framework. Hence, according to the framework, different religions or religious affiliations represent different categories, which are connected with specific social norms influencing individual behavior. In that sense, non-compliance with the prevailing values and norms of a certain religion would lead to utility loss due to, for example, cognitive dissonance. Accordingly, one can argue that one's personal religious identity (Benjamin et al. 2016) and also the predominant local religion which influences personal cultural values and norms (e.g., Welch et al. 1991; Kumar et al. 2011; Salaber 2013) affect individual behavior and decisions.

Notwithstanding the role of religion, this paper focuses on Christian religion,¹ is not well examined, and is only seldom considered in the context of environmental and social behaviors, particularly when it comes to consumption and investment decisions. This is surprising as empirical studies show that Christian religion strongly affects a variety of individuals' economic attitudes and behaviors (e.g., Arruñada 2010; Iannaccone 1998; Kumar et al. 2011), pro-environmental behavior (e.g., Cui et al.

¹ 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.

2015), pro-social behavior (e.g., Andorfer 2013; Andreoni et al. 2016; Doran and Natale 2011), and SRI or socially controversy investments (e.g., Salaber 2013), while it particularly has played an important role in the development of, for example, the fair trade movement or SRI (Doran and Natale 2011; Renneboog et al. 2008). Thus, gaining knowledge of the relationship between religion and sustainable consumption or investment behavior could help to implement adequate policy measures in order to solve the problems mentioned in the beginning. Further, as shown in “Literature Review and Hypotheses: Christian Religion and Individual Behavior” section, most studies are conducted based on US data and it is an empirical question whether these results are externally valid, i.e., hold in other Western countries with a different religious structure (Pepper and Leonard 2016; Renneboog and Spaenjers 2012). Empirically analyzing the role of religion on the connection of religion and environmental or social behaviors, and particularly consumption and investment decisions, is also interesting as previous empirical studies revealed ambiguous effects (e.g., Sherkat and Ellison 2007; Martin and Bateman 2014). Hence, it is yet not clear whether Christian religion positively or negatively influences sustainable consumption or investment decisions, and both kinds of results could be explained by opposing approaches, such as the stewardship hypothesis (e.g., Sherkat and Ellison) or White’s (1967) dominion hypothesis, as discussed later. Even more importantly, Christian religion naturally allows examining the effect of personal, but also contextual values on individual sustainable behavior. So far, empirical studies have been mainly considered measures for individual religion or religiosity, and only used regional measures in the case that no individual data were available, i.e., as proxy for individual measures (see, e.g., Borgers et al. 2015). Further, these studies considered neither various behaviors nor different regional and individual measures of religion (or religiosity) in the same empirical analysis, or omitted important control variables, such as political orientation, though these issues appear 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 and Sherkat and Ellison (2007) highlight the relationship between individual religion and political orientation.

To this end, our rather exploratory study empirically analyzes 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 information on the self-reported importance of ecological and social/ethical criteria in 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. Individuals were additionally asked about their religious confession and attendance in religious services, political orientation, voluntary activities, and a large set of socioeconomic and sociodemographic variables. We merge this dataset with regional information on religiosity (and also political preferences) at the zip code level, in order to identify both the importance of regional context and individual values on individual pro-environmental and pro-social behavior.

Indeed, our econometric analysis reveals that Christian religion is positively related to a variety of (self-reported) ecological and social/ethical activities. With respect to the relationship between Christian religion and environmental activities, we thus rather find empirical support for the stewardship hypothesis (or alternative explanations for a positive relationship) than for White’s (1967) dominion hypothesis. Particularly, we find that both individual and regional measures for Christian religion positively affect various behaviors emphasizing the importance of individual and contextual norms for individual behavior. Hence, we provide empirical evidence for the importance of Christian religion for another country than the US, which is typically in the focus of similar studies. Hence, we see that contextual factors affect the importance of the consideration of sustainability criteria in a variety of behaviors, even if they differ in terms of observability.

This study thus contributes to academic literature in several ways. First, our empirical results contribute to the literature on the importance of individual and contextual effects for economic decisions of individuals in general, and particularly in the case of environmental and social consumption and investment decisions. Thereby, this paper is also related to the research field on non-financial motives for SRI. Secondly, we contribute to the role of Christian religion in economic relevant decisions in general, and environmental and ethical consumption and investment decisions in particular. Here, we provide new empirical evidence on the importance of religion in economics for a large Western country, which has a different religious background than the USA that is usually in the focus of these kinds of studies.

The remainder of this paper is structured as follows: “Literature Review and Hypotheses: Christian Religion and Individual Behavior” section provides a literature review of theories and empirical studies on the relationship between religion and pro-environmental (“Religion and Pro-environmental Behavior” section) and pro-social behavior (“Religion and Pro-social Behavior” section) and derives several hypotheses. The “Data, Variables, and Econometric Approaches” section describes the datasets and explains the construction of variables as well as the econometric approaches used in the empirical analysis. The

“**Econometric Results**” section reports the empirical results: While the “**Estimation Results for Aggregate Measures**” section presents the main results, the “**Relationship Between Individual and Regional Religion**” section sheds light on the interrelation between individual and regional religion and self-reported sustainable behaviors, the “**Comparison Across Different Behaviors**” section considers different self-reported behaviors separately, and the “**Robustness Checks**” section provides robustness checks. The “**Conclusion and Discussion**” section concludes, discusses the results, and makes proposals for further research.

Literature Review and Hypotheses: Christian Religion and Individual Behavior

Theory and particularly empirical studies considering the relationship between Christian religion and economically relevant individual behaviors have grown slowly, but today they address a wide variety of economic topics (Arruñada 2010; Iannaccone 1998). Most empirical studies in this field are carried out on the basis of data from the USA, where religion plays a very special role and seems to be more important than in other Western regions, such as Europe (Hood et al. 2014; Iannaccone 1998). For example, membership rates in American Churches have risen over the past two hundred years (Iannaccone 1998), while they rather have decreased in other large Western economies such like Germany during the last decades. Further, the US structure of Christian denominations differs from Germany: While in the USA, Evangelical Protestants represent an important and large share within Christian denominations, Germany is dominated by moderate Protestants and Catholics. Hence, it is questionable whether empirical results from the USA are externally valid in other Western countries, as Renneboog and Spaenjers (2012) already argue in the case of their empirical study on individual investment behavior, which was conducted in the Netherlands.

Empirical studies generally support the notion that Christian religion influences economic relevant behaviors, such as consumption (e.g., Andorfer 2013) or financial decisions (e.g., Hong et al. 2004; Renneboog and Spaenjers 2012; Hood et al. 2014), and economic attitudes, such as risk aversion (e.g., Kumar et al. 2011; Salaber 2013). By way of example, Andorfer (2013) find that religious households are more likely to consume fair trade products. Hong et al. (2004) empirically find that households that attend church more often are more likely to hold stocks, while Renneboog and Spaenjers (2012) find a higher propensity to save among Dutch religious households and

that Catholics are less likely to invest in stocks than persons with no religious confession.

Differences in economic behavior of various Christian denominations, and especially between Catholics and Protestants, have been analyzed since Weber’s (1930) hypothesis postulating harder and more efficient work of Protestants compared to Catholics due to diverging developments with respect to, for example, organizational structures and moral rules after the Reformation (Arruñada 2010). Though, empirically evidence rather contradicts Weber’s (1930) perspective (e.g., Arruñada 2010; Benjamin et al. 2016), nevertheless, empirical studies generally support the notion that Catholics and Protestants behave differently in many economically relevant fields. By way of example, Arruñada (2010) empirically finds a stronger social ethic for Protestants compared to Catholics, which, among others, means that Protestant values are more homogenous than those of Catholics and that social interactions and second- or third-party enforcement is stronger among Protestants than Catholics, as discussed below. Further, he empirically finds that Catholics are less likely to voluntarily work than Protestants. These differences are explained by diverse mechanisms of salvation and the position of the Church within each confession leading to different enforcement mechanisms of social norms (Arruñada 2010). Benjamin et al. (2016) also refer to the organizational structure of Catholicism compared to Protestantism and argue that the horizontal structure of Protestant Churches fosters trust and contributions to a public good (as opposed to the centralized and vertical structure in Catholic Churches). In an experimental approach, they empirically show that making religious identity salient to Protestants positively affects their contributions to a public good, whereas they find a negative effect for Catholics. They further theoretically summarize and empirically show that differences and similarities in the beliefs of afterlife and moral teaching of Catholics and Protestants affect their economic choices. Empirical evidence for the latter case is also provided by other studies. Kumar et al. (2011), for example, find that Protestant are less likely to invest in lottery-type stocks and explain this by different norms regarding gambling and risk aversion. A more detailed and extensive overview on differences in economic relevant behaviors between Catholics and Protestants is provided by Arruñada (2010).

The former paragraph shows that Christian religion, the organizational structure within the different Churches, different moral norms, but also interactions between the members of the churches may affect individual behavior and illustrates what Iannaccone (1998) means when stating that ‘religious behavior is anything but an individual matter’ (Iannaccone 1998, p. 1482). Hence, individual economic

actions and decisions are constrained by certain social norms, as set by religion, and can be enforced and influenced by interactions with other church members (Arruñada 2010; Sherkat and Ellison 2007). In this context, Hong et al. (2004), for example, find that social interaction measured by church attendance positively affects stock market participation and explain their findings by lower information costs and the joy of chatting about a certain topic. Hence, shedding more light and disentangling the relationship between religion and environmental or social behaviors could help to solve the problems mentioned in the very beginning of this study, while this should be particularly promising in more religious areas. However, the choice of adequate measures to solve these problems obviously depends on whether Christian religion positively or negatively influences individual pro-environmental or pro-social behaviors.

Religion and Pro-environmental Behavior

With respect to environmental behavior, theory generally provides arguments for both a negative and positive effect of Christian religion on pro-environmental behavior. The dominating explanation for a negative relationship between Christian religion and pro-environmental behavior is the so-called dominion hypothesis introduced by White (1967). It postulates 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 based on narratives in the first Book of Genesis in Christian Old Testament, particularly Genesis 1:28 (e.g., Martin and Bateman 2014; Cui et al. 2015; Pepper and Leonard 2016).² Empirical sociological studies show that this view is positively related to conservative religious views (e.g., Pepper and Leonard 2016). However, also other beliefs, such as end-time thinking by fundamentalists, believing that God already cares about nature, or that living on earth is just temporary, could lead to negative effects on environmental concerns (Farrell 2013; Wolkomir et al. 1997).

However, Sherkat and Ellison (2007) argue that the large variety in the structure of Christian denominations does not allow the simple explanation that Christianity has always a negative impact on pro-environmental behavior. Particularly, for moderate denominations it can be argued that they rather feel responsible for the environment and thus try to preserve God's creation instead of exploiting it. The belief that nature is sacred or God is present in nature could also positively affect environmental behavior (e.g.,

Farrell 2013; Pepper and Leonard 2016; Sherkat and Ellison 2007) and depend on the individuals' level of conservatism (Pepper and Leonard 2016).³ The stewardship hypothesis, which has also roots in the Old Testament (e.g., Sherkat and Ellison 2007), consequently demands individuals to preserve the environment, because it was created by God and thus a positive effect of (Christian) religion on pro-environmental behavior (e.g., Cui et al. 2015; Pepper and Leonard 2016).

Related sociological and psychological empirical studies usually consider environmental concerns or other environmentally friendly behaviors, which are not directly related to purchase or investment decisions (such as the frequency of car usage, recycling activities, or political activism), and provide ambiguous evidence, i.e., some support the dominion hypothesis, whereas others find evidence for the stewardship hypothesis (for extensive overviews, see, e.g., Martin and Bateman 2014; Pepper and Leonard 2016; Sherkat and Ellison 2007). 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, and watching TV about environmental issues) in the past. Contrary to the dominion hypothesis, they find that Judeo-Christians⁴ 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 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.⁵ However, they do not consider different religious affiliations

² In Genesis 1:28, it is written: 'God blessed them and said to them, "Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground.'"

³ Christian conservatism is not necessarily positively associated with dominion beliefs. For further discussion, see Pepper and Leonard (2016).

⁴ We use the term 'Judeo-Christian' as it was used in the corresponding study.

⁵ Analogously to footnote 4, we use the same expression as it is used in the study quoted.

or other dimensions of religiosity, since religion was not the core of this paper. With respect to investment decisions, there are several studies examining the relationship between religion and investment decisions in general (as mentioned above) or the consideration of social/ethical criteria in investment decisions in particular (as discussed in “[Religion and Pro-social Behavior](#)” section), but we are not aware of any study analyzing the link between religion and the importance of environmental issues in investment decisions.⁶ Hence, in sum there is obviously a relationship between Christian religion or religiosity and pro-environmental behavior in the USA. However, it is empirically unclear whether this is externally valid and, if so, whether they are positively or negatively related to each other. Consequently, based on these theoretical arguments and empirical findings, we state the following opposing hypotheses:

Hypothesis 1a (Religious) Catholics or Protestants are less likely to consider ecological criteria in (self-reported) purchase, consumption, and investment decisions than non-religious persons.

Hypothesis 1b (Religious) Catholics or Protestants are more likely to consider ecological criteria in (self-reported) purchase, consumption, and investment decisions than non-religious persons.

Additionally, according to the model by Czajkowski et al. (2017) discussed above, we would expect that individuals try to act not only in conformity with their personal norms, i.e., personal religious values, but also care about that what others think of them, i.e., thus try to live in conformity with the prevailing norms in the community. Thus, we state the following hypotheses:

Hypothesis 2a An increasing regional share of Catholics or Protestants negatively influences the propensity to consider ecological criteria in (self-reported) purchase, consumption, and investment decisions among persons living in these areas.

Hypothesis 2b An increasing regional share of Catholics or Protestants positively influences the propensity to

consider ecological criteria in (self-reported) purchase, consumption, and investment decisions among persons living in these areas.

In sum, Christian teaching, worldviews, and norms can theoretically both facilitate or hamper pro-environmental behavior (e.g., Farrell 2013; Pepper and Leonard 2016), and it is an empirical question whether Christian religion positively or negatively affects pro-environmental consumption and investment decisions. Explanations for a negative relationship, such as White’s (1967) dominion hypothesis, are captured by our hypotheses 1a and 2a, while opposing approaches, like the stewardship hypothesis, are reflected by our hypotheses 1b and 2b.

Religion and Pro-social Behavior

Theoretical expectations and empirical findings are more intuitive with respect to the consideration of social or ethical criteria in individuals’ purchase or investment decisions. Purchase and consumption of fair trade products, as typical example of ethical purchase behavior (Doran and Natale 2011), may be strongly associated with personal values that are congruent to the goals of the fair trade movement. Accordingly, individuals sharing these values should be more likely to purchase these kinds of products as they try to avoid cognitive dissonance (Andorfer 2013). This again shows that behaving in conformity with one’s own values, but also with the prevailing social norms as outlined in the model by Czajkowski et al. (2017) could strongly influence individual consumption decisions in this context. Hence, it seems natural that Christian religion, with its values of benevolence or charity, has been a strong driver for the development of fair trade products (e.g., Andorfer 2013; Doran and Natale 2011). Doran and Natale (2011) particularly refer to the Golden Rule that, for example, can be found in Matthew 7:12: ‘So in everything, do to others what you would have them do to you, for this sums up the Law and the Prophets.’ Similarly, the growth of SRI has been strongly driven by religious groups (see, e.g., Renneboog et al. (2008) for a historic overview).

Empirical studies investigating the effect of religion on pro-social behavior in context of consumption decisions are rather scarce, though its historical connection to fair trade consumption (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

⁶ The Evangelical Church in Germany (EKD 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. This might highlight the official position of the German Churches regarding the inclusion of sustainability criteria in investment decisions, but that does not necessarily mean that Christian religion positively or negatively affects individual investment decisions in context of SRI in Germany (particularly, as the guidelines of the Central Committee of German Catholics were published after our survey was conducted).

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 that underlying fair trade consumption and thus religiosity should positively influence the willingness to pay for these products. Indeed, the empirical analysis reveals that religiosity positively affects 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 rises. However, they mention themselves that their results have to be interpreted with caution due to data issues.

In context of individual investment behavior, the vast majority of studies on socially controversy 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 lead 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 toward sin stock industries than Protestants. For the USA, 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 lead to a reduction in sin stock investment by the fund manager. Hence, these studies suggest a positive effect of Christian religiosity, but also that Catholics are more tolerant toward social controversy behavior than Protestants, for example with respect to consumption of alcohol or tobacco.

Though Doran and Natale (2011) find negative effects, we follow the theoretical expectations and most other empirical findings. Thus, we expect a positive relationship between Christian religion or religiosity on both the individual and regional levels and the consideration of social/ethical criteria in purchase, consumption, and investment decisions. These expectations are summarized under hypotheses 3 and 4.

Hypothesis 3 (Religious) Catholics or Protestants are more likely to consider social/ethical criteria in (self-reported) purchase, consumption, and investment decisions than non-religious persons.

Hypothesis 4 An increasing regional share of Catholics or Protestants positively influences the propensity to consider social/ethical criteria in (self-reported) purchase, consumption, and investment decisions among persons living in these areas.

Data, Variables, and Econometric Approaches

The exploratory empirical analysis is based on two data sources. First, we use information on individuals' self-reported consumption, travel, transportation, and investment behavior, which stem from a broad (online) representative (with respect to age, gender, and region)⁷ 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

⁷ Comparing sample statistics with respect to age, gender, and place of religion at the federal state level with figures published by the Federal Statistical Office in Germany shows that we can speak of representativeness with good conscience. Sample statistics of religious affiliation and political orientation are also very similar to official figures. Solely in case of Catholics, our sample only contains a share of 26% of persons with a Catholic denomination compared official shares of 30 and 29% in Germany in 2013 and 2014, respectively.

for the household's financial decisions, and hold at least a savings account (or a more complex investment product). Using the quality saving system TIGO 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.

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 purchases, investments, but also other consumption areas and activities, such as the choice of transportation modes or travel behavior. 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.⁸ The corresponding descriptive statistics are reported in Tables 1 and 2. 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 questions 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 a person chose either 'rather strongly' or 'very strongly.'⁹ 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 such as '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.¹⁰ The descriptive statistics presented in Table 1 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 2). Only in case of clothes people put more weight on social/ethical than on ecological criteria (40 vs. 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).

⁸ We conducted a confirmatory factor analysis that indeed supported the way we constructed our ecological indices. Further, in case of this index Cronbach's alpha is 0.8482 and the average inter-item covariance amounts to 0.59. A correlation matrix for all items is presented in Table 13 in the Appendix.

⁹ In case of this index, Cronbach's alpha is 0.8012 and the average inter-item covariance amounts to 0.57.

¹⁰ In case of this index, Cronbach's alpha is 0.8943 and the average inter-item covariance amounts to 0.73.

Table 1 Relative frequencies for dependent variables with ordinal scale

Dependent variable	1 (in %)	2 (in %)	3 (in %)	4 (in %)	5 (in %)	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 2 Descriptive statistics for further dependent variables

Dependent variables	No. of observations	Mean	SD	Minimum	Maximum
Eco activity index	882	1.97	1.84	0	6
Eco purchases index	970	1.97	1.35	0	4
Social purchases index	967	1.35	1.47	0	4

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.' Here, the corresponding descriptive measures in Table 1 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. We also asked the respondents whether they were currently invested in SRI, and about 20% of the respondents stated that they were currently invested in these kinds of investments.¹¹ However, we do not consider this question for our analysis for two reasons: First, the wording was different and not comparable with the previous questions about other (consumption) activities. Secondly, we indeed have information about whether (and how strongly) they are invested in SRI, but do not know

¹¹ We also have information on the investment experiences of the respondents as we asked them to indicate which kinds of investment products they had in their portfolio (they could choose between savings account, stocks, equity funds, and twelve other products). Further information and descriptive statistics are available upon request.

whether they hold investments with a focus on ecological or social/ethical criteria. Hence, we refer to the two questions outlined above throughout this paper.

Explanatory 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 with more religious countries like the USA, we follow analysis by Renneboog and Spaenjers (2012) 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, and we asked all persons with an affiliation for the number of days per week they actively pursue their religion (for example, pray).¹² We included the second question as religious affiliation alone might not sufficiently and only indirectly measure individual religiosity (e.g., Renneboog and

¹² See, for example, Hong et al. (2004) who use a similar question.

Spaenjers 2012).¹³ 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 3 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 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 901 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.¹⁴ Table 3 shows that the average regional shares of Catholics (31%) and Protestants (31%) are nearly equal.¹⁵

Sherkat and Ellison (2007) state that the complex relationship between religious and political orientation in context of environmental issues has to be considered and that this relationship was neglected by many previous studies. In this context, already Greeley (1993) argues that empirical results indicating a negative relationship between religion and environmental orientations could stem from an underlying conservative political orientation instead of religious values. Consistent with that idea, Hong and Kostovetsky (2012) state that religious persons tend to vote the Republican party. Pepper and Leonard (2016) argue the estimation will be improved by controlling for individual political orientation,

¹³ 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 “Robustness Checks” section.

¹⁴ 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.

¹⁵ 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 “Robustness Checks” section). However, ‘Share of Catholics’ and ‘Share of Protestants’ reveal the most informative estimation results in our case.

while the effects of religion should not be affected. 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).¹⁶ Hence, in order to mitigate potential bias due to omitted variables, we also include measures of political orientation at the individual and regional levels. By doing so, we not only consider important control variables, but can provide empirical evidence for the relevance of another contextual variable.

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.¹⁷ 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 US 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).¹⁸ On average, 36% of

¹⁶ Further 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. Generally, previous studies in the field of pro-environmental or pro-social consumption find clear differences between left- and right-aligned voters (see, e.g., Costa and Kahn 2013; Dastrup et al. 2012; Kahn 2007), while empirical studies on this issue are rare in context of investment decisions and even reveal unexpected results. For example, Hood et al. (2014) analyze individuals’ stock holdings of US firms and find that investors from Democratic counties are less likely to invest in stocks with environmental strengths in terms of KLD ratings.

¹⁷ 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”.

¹⁸ 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).

Table 3 Descriptive statistics for all explanatory variables

Explanatory variables	No. of observations	Mean	SD	Minimum	Maximum
<i>Individual religiosity</i>					
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 ^a	716	0.03	0.16	0	1
<i>Regional religiosity</i>					
Share of Catholics	984	0.31	0.21	0.02	0.89
Share of Protestants	984	0.31	0.15	0.05	0.72
Share of others ^b	984	0.28	0.11	0	0.56
<i>Individual political orientation</i>					
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 ^c	778	0.12	0.33	0	1
<i>Regional political orientation</i>					
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 ^d	984	0.11	0.02	0.05	0.19
<i>Controls</i>					
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
West	1001	0.82	0.38	0	1

^a 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

^b This is a very heterogeneous group, which is included as we want to ensure that the share of non-adherents represents the base group

^c Thus, the base group contains persons that generally prefer the Christian Democratic Party or the Liberal Party

^d 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

the respondents are left-wing voters (SPD: 26%, Left Party: 10%), while 13% support the Green Party (see Table 3).¹⁹ 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).²⁰ The regional variables are defined similarly to the individual definitions above: The variables 'SPD share,' 'Left Party share,' and 'Green Party share'

¹⁹ These figures are very close to those published by the German opinion research institute Infratest Dimap for December 2013 (see infratest dimap 2013).

²⁰ 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).

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 other social interactions²¹ (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 3 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 sociodemographic variables. The sample mean of age is 43.91 years (variable ‘Age’), 49% of the respondents are female (‘Female’),

Thirty-five percentage have at university degree (‘University degree’), 51% are married (‘Married’), and 31% have children under 18 years of age living in their household (‘Kids’). We also 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). In order to control for regional discrepancies, we also consider whether the respondent lives in Western or Eastern Germany. Accordingly, we construct the dummy variable ‘West’ and find that 82% of the respondents live in Western Germany.

Econometric Approaches

We first analyze general pro-environmental and pro-social behavior by considering the different index variables ‘Eco activity index,’ ‘Eco purchases index,’ and ‘Social purchases index’ as dependent variables. As these variables count how often 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

²¹ 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.

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.²²

Nonetheless, as these results only provide a general look on pro-environmental and pro-social behavior and determinants might vary across different behaviors, we additionally make use of ordered 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.²³

Econometric Results

Estimation Results for Aggregate Measures

The parameter estimates in the different count data models with respect to the three different indices are reported in Table 4. 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 ‘Eco activity index’ and

²² 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.

²³ We also considered multivariate ordered probit and a variety of (bivariate) binary probit models in an earlier version of this study in order to take the strong correlation between the different behaviors into account [see, e.g., Ziegler (2013) for the case of process and product innovations]. However, the results are very similar and we report the results in the less sophisticated ordered probit models to increase the readability of this study.

Table 4 ML estimates for parameters in Negbin regression and Poisson regression models for the relevance of individual and regional Christian religion on various aggregated measures for self-reported behaviors

Explanatory variables	Eco activity index		Eco purchases index		Social purchases index	
	(4a)	(4b)	(4c)	(4d)	(4e)	(4f)
<i>Individual and regional religiosity</i>						
Catholic	0.32*** (0.11)	–	0.02 (0.08)	–	0.15 (0.13)	–
Protestant	0.23** (0.10)	–	–0.01 (0.07)	–	0.07 (0.12)	–
Other religions	0.08 (0.26)	–	0.06 (0.16)	–	0.14 (0.27)	–
Religiously active C+P	–	0.43*** (0.10)	–	0.17** (0.07)	–	0.47*** (0.12)
Religiously active others	–	–0.28 (0.23)	–	–0.12 (0.18)	–	–0.43 (0.29)
Share of Catholics	2.71** (1.07)	2.90** (1.16)	1.03 (0.79)	1.36 (0.83)	0.47 (1.52)	0.56 (1.74)
Share of Protestants	3.10*** (1.14)	2.99** (1.28)	1.31 (0.82)	1.60* (0.88)	1.01 (1.57)	1.11 (1.83)
Share of others	3.88*** (1.35)	4.03*** (1.44)	1.33 (1.01)	1.83* (1.03)	0.97 (1.90)	1.19 (2.16)
<i>Controls: individual and regional political orientation</i>						
SPD	0.11 (0.10)	0.20* (0.11)	0.03 (0.07)	0.14* (0.08)	0.14 (0.12)	0.29** (0.14)
Left Party	0.43*** (0.14)	0.42*** (0.15)	0.21** (0.10)	0.26** (0.11)	0.44*** (0.16)	0.54*** (0.17)
Green Party	0.52*** (0.12)	0.65*** (0.13)	0.24*** (0.09)	0.34*** (0.09)	0.35** (0.14)	0.55*** (0.16)
Other parties	0.03 (0.13)	0.08 (0.15)	–0.05 (0.10)	0.03 (0.11)	–0.11 (0.17)	0.05 (0.19)
SPD share	–0.09 (0.84)	0.45 (0.93)	–1.92*** (0.57)	–1.98*** (0.63)	–0.66 (1.02)	–0.94 (1.18)
Left Party share	3.03 (2.68)	3.02 (3.17)	1.65 (1.79)	2.27 (2.07)	0.22 (3.38)	1.88 (4.01)
Green Party share	2.36 (1.49)	2.96* (1.68)	1.65 (1.02)	1.76 (1.11)	1.35 (1.80)	1.78 (2.11)
Other party shares	0.18 (2.03)	1.44 (2.26)	0.78 (1.52)	0.39 (1.65)	3.52 (2.66)	1.24 (3.06)
<i>Controls: social interactions</i>						
Voluntarily active	0.17** (0.08)	0.17** (0.09)	0.17*** (0.06)	0.16*** (0.06)	0.34*** (0.09)	0.34*** (0.10)
Environmental organization	0.20* (0.11)	0.21* (0.11)	0.24*** (0.07)	0.23*** (0.08)	0.26** (0.12)	0.23* (0.13)
Constant	–1.01*** (0.18)	–1.17*** (0.21)	–1.22 (0.86)	–1.36 (1.45)	–2.08 (1.86)	–0.57 (1.90)
Further controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	542	444	540	489	598	491

The ML parameter estimates in Negbin II regression models (columns 1, 2, 5, and 6), and two Poisson regression models (columns 2 and 3), dependent variables: 'Eco activity index,' 'Eco purchases index,' and 'Social purchases index' are count data variables, number of observations = 542, 444, 540, 489, 598, and 491, respectively. Cluster-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

the ‘Social purchases index,’ but not in the case of the ‘Eco purchases index’. Thus, we present the estimation results for Negbin II regression models in columns 1, 2, 5, and 6 and parameter estimates in Poisson regression models for the second and third models.

The ML estimates in model 4a and 4b of Table 4 reveal that Catholics and Protestants significantly more often report to strongly consider ecological criteria in context of behaviors captured by the ‘Eco activity index’ than individuals with no religious affiliation. We additionally find that ‘Religiously active C + P’ is significantly positively related to the ‘Eco activity index,’ indicating that religiously active Catholics and Protestants tend to state more often that they consider ecological criteria in their activities than their counterparts.²⁴ For this variable, we find similar patterns for both purchases indices, whereas the estimations reveal no hint for a significant relationship between individual religious affiliation and these indices. Hence, we rather find empirical support for hypothesis 1b, i.e., the stewardship hypothesis or other explanations for a positive relationship between Christian religion and pro-environmental behavior, and hypothesis 3 and particularly no hints for a negative relationship between individual Christian religion and ecological or social activities or purchase decisions. That is, we find no empirical evidence for the dominion hypothesis reflected by hypothesis 1a.

With regard to the contextual influence of Christian religion, we further see that the ‘Eco activity index’ is also significantly positively influenced by the share of Catholics and Protestants in the region a financial decision maker lives in. This means 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 (independently of one’s own religious affiliation). Hence, for these activities, but not for purchase decisions, we again find empirical support for the stewardship hypothesis (or alternative explanations). In case of the aggregated measures for purchase decisions, the only (weakly) significant (but positive) effects are revealed in model 4d, indicating that an increasing regional share of Protestants is positively related to the number of times a person states that he/she considers ecological criteria in purchases decisions. However, we find no empirical support for hypothesis 4. In sum, we mainly find hints for a positive relationship between individual and regional Christian religion and our indices and thus indirect empirical evidence for the stewardship hypothesis or other concepts postulating a positive relationship between Christian religion and environmental

behavior. However, it is clear that we cannot identify the underlying channel as we have no information on more detailed religious attitudes or beliefs of the respondents. Further, the influence of Christian religion obviously varies across behaviors and is strongest in cases of activities captured by the ‘Eco activity index’ (we discuss the issue in more detail in “[Comparison Across Different Behaviors](#)” section). Generally, we find clear evidence for our hypotheses that both individual and regional effects affect sustainable behaviors and purchase decisions, which we interpret as empirical support for theoretical models highlighting the influence of individual and social norms on individual behavior.

These findings are at least partially supported as we additionally find weak empirical evidence for an effect of regional political orientation on self-reported ecological behaviors (see models 4b, 4c, and 4d). With respect to individual political orientation, we further find expected results, i.e., persons with a left-aligned political orientation tend to report more often that they consider ecological or social issues in their activities or consumption decisions. We also find highly significant estimates for ‘Voluntarily active’ and ‘Environmental organization.’ These findings are in line with previous studies and may indicate 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 word-of-mouth communication channel as described by Hong et al. (2004). 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.

Table 5 reports the ML parameter estimates in four ordered probit models considering the self-reported importance of ecological and social/ethical criteria in investment decisions. The estimates show that Protestants are significantly more likely to very strongly consider ecological or social/ethical criteria in their investment decisions than persons with no religious affiliation (see models 5a and 5c). However, these effects are only significant at significance levels of 5 or 10%, respectively. We find no significant results for Catholics. The estimated coefficients for ‘Religiously active C + P’ in models 5b and 5d are significant and positive, indicating that religious Catholics and Protestants are more likely to report that they strongly consider ecological or social/ethical criteria in their investment decisions. Hence, as in the case of activities and purchase decisions, we find empirical support for hypotheses 1b and 3. Thus, with respect to the consideration of ecological criteria, we again find support for the stewardship hypothesis or alternative explanations rather than for the dominion hypothesis. However, except for one case (namely ‘Share of Catholics’ in model 5a, which is

²⁴ 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.

Table 5 ML estimates for parameters in ordered probit models for the relevance of individual and regional Christian religion on the self-reported consideration of ecological and social criteria in investment decisions

Explanatory variables	Eco invest		Social invest	
	(5a)	(5b)	(5c)	(5d)
<i>Individual and regional religiosity</i>				
Catholic	0.16 (0.13)	– –	0.11 (0.13)	– –
Protestant	0.28** (0.12)	– –	0.20* (0.11)	– –
Other religions	0.20 (0.29)	– –	0.15 (0.29)	– –
Religiously active C+P	– –	0.43*** (0.10)	– –	0.17** (0.07)
Religiously active others	– –	–0.28 (0.23)	– –	–0.12 (0.18)
Share of Catholics	2.45* (1.31)	1.71 (1.55)	–0.03 (1.29)	–1.01 (1.55)
Share of Protestants	2.27 (1.40)	1.82 (1.67)	–0.52 (1.39)	–1.39 (1.70)
Share of others	2.66 (1.69)	1.82 (1.97)	–0.40 (1.70)	–1.61 (2.01)
<i>Controls: individual and regional political orientation</i>				
SPD	0.01 (0.11)	0.20* (0.12)	0.08 (0.11)	0.27** (0.13)
Left Party	0.24 (0.18)	0.29 (0.19)	0.27 (0.17)	0.39** (0.19)
Green Party	0.28* (0.15)	0.42** (0.16)	0.22 (0.15)	0.41** (0.16)
Other parties	0.01 (0.15)	–0.03 (0.17)	–0.12 (0.15)	–0.12 (0.17)
SPD share	0.18 (1.05)	0.02 (1.26)	0.24 (1.05)	0.24 (1.27)
Left Party share	6.10** (3.07)	6.96* (3.57)	3.69 (2.97)	4.90 (3.45)
Green Party share	3.75** (1.72)	5.22*** (1.91)	2.46 (1.79)	4.02* (2.06)
Other party shares	0.89 (2.24)	1.39 (2.55)	–0.90 (2.42)	–0.47 (2.87)
<i>Controls: social interactions</i>				
Voluntarily active	0.26*** (0.09)	0.30*** (0.10)	0.35*** (0.10)	0.39*** (0.11)
Environmental organization	0.46*** (0.14)	0.46*** (0.16)	0.39*** (0.15)	0.43*** (0.15)
Further controls	Yes	Yes	Yes	Yes
Observations	601	494	604	497

The ML parameter estimates in four ordered probit models, dependent variables: ‘Eco invest’ (columns 1 and 2), ‘Social invest’ (columns 3 and 4), number of observations = 601, 494, 604 and 497, respectively. Cluster-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

only significant at the 10% significance level), we find no support for the relationship between regional religion and the probability to report very strong consideration of ecological and social/ethical criteria investment decisions. Hence, again we find no empirical support for hypothesis 4. One potential explanation could be that individual investment decisions are hardly observable by other community members and typical enforcement mechanisms do not apply in this case. Czajkowski et al. (2017) also make this argument in their formal model by stating that the individuals' contribution to a public good equals zero in case that others cannot observe the corresponding behavior. Contrarily, also non-observable behavior could be influenced by peers if other channels exist, such as word-to-mouth communication (e.g., Hong et al. 2004). The results also reveal significantly positive effects of an increasing share of regional left-aligned political orientation on the consideration of ecological criteria in investment decisions (see models 5a and 5b). This rather indicates that the degree of observability is not an issue here, but that regional religion is less important than regional political values in case of investments. In sum, however, we find no empirical support for hypotheses 2a, 2b, or 4 in case of investment decisions.

In-Depth Analyses

Relationship Between Individual and Regional Religion

In order to shed more light on the relationship between individual and regional Christian religion, we compare the estimation results based on different subsamples in an explorative manner in this section. An alternative approach would be the inclusion of interaction terms between individual and regional measures for Christian religion. However, we apply the first approach as the interpretation of interaction terms and effects in nonlinear models is often complicated and not straightforward (see, e.g., Ai and Norton 2003; Greene 2010).

Table 6 reports estimation results for the three aggregated indices. The first, third, and fifth columns report the parameter estimates in count data regression models on the basis of a subsample that only contains religiously active Catholics and Protestants, i.e., 'Religiously active C + P' takes the value one. In contrast, the second, fourth, and sixth models only include persons that are not religiously active, i.e., both 'Religiously active C + P' and 'Religiously active others' equal zero. The estimation results for models 6a and 6c clearly indicate that contextual effects of Christian religion are significantly positive and thus relevant for religiously active Catholics and Protestants (we find no such effects in case of self-reported social purchase decisions). However, there are no hints that regional Christian religion

has a significant influence on self-reported ecological behaviors for persons who are not religiously active (expect a weakly significant positive effects for 'Share of Protestants' in model 6b). These findings might indicate that contextual religious norms might particularly affect religious persons and are further supported by the finding that political values or the variables capturing other social interactions are found to be highly relevant in case of non-religious persons. We interpret this as indication that these non-religious people rather express their ecological or social/ethical attitudes via these attending voluntary activities, while religiously active persons do this via attending religious services (though there are of course also religiously active respondents who conduct volunteer work).

In case of investment decisions (see Table 7), we find no significant effects of regional religion in any of the models, regardless of the degree of religiosity of the persons. Thus, regional Christian religion seems to affect neither the behavior of religiously active nor non-religiously active persons in the case of the self-reported consideration of ecological and social/ethical criteria in investment decisions. However, we again see that particularly political orientation is important for non-religious people.

Tables 8 and 9 examine different subsamples with respect to different individual confessions. The first column for each dependent variable refers to the estimation results for Catholics, i.e., 'Catholic' takes the value one, and the second column analogously reports results for Protestants, i.e., 'Protestant' is equal to one. Generally, we find no significant qualitative differences regarding the impact of regional Christian religion for Catholics and Protestants, except for model 8a and model 9b. Results in model 8a reveal that regional religion significantly increases the number of self-reported ecological activities among Catholics. Similarly, we find a significant positive effect for the regional share of Catholics on the self-reported consideration of ecological criteria in investment decisions among Protestants. This shows that the regional religious context may affect individuals, even if they have a different denomination. However, we are not able to identify underlying channels in order to explain these differences. Hence, we leave this for future research.

Finally, we also considered the possibility to construct subsamples on the basis of regional variables, such as comparing the case where the share of Catholics exceeds the share of Protestants with its opposite. However, this was not applicable due to underlying regional patterns: By way of example, the regional share of Catholics exceeded the regional share of Protestants only in Western Germany. Accordingly, we are able to distinguish between effects due to different religious shares and those which stem from regional differences between Western and Eastern Germany. However, this highlights that it is important to

Table 6 ML estimates for parameters in Negbin regression and Poisson regression models for the relevance of regional Christian religion on various aggregated measures for self-reported behaviors by individual religious activity

Explanatory variables	Eco activity index		Eco purchases index		Social purchases index	
	(6a)	(6b)	(6c)	(6d)	(6e)	(6f)
<i>Individual and regional religiosity</i>						
Share of Catholics	2.45* (1.48)	2.57 (1.58)	2.65** (1.32)	0.66 (0.99)	0.73 (2.91)	0.15 (2.13)
Share of Protestants	2.31 (1.83)	2.84* (1.68)	2.92** (1.44)	0.86 (1.05)	0.99 (2.95)	0.82 (2.24)
Share of others	4.98*** (1.56)	3.02 (2.15)	3.80*** (1.44)	0.65 (1.28)	2.57 (3.53)	0.02 (2.47)
<i>Controls: individual and regional political orientation</i>						
SPD	0.02 (0.16)	0.30* (0.15)	0.17 (0.13)	0.13 (0.10)	0.16 (0.20)	0.42** (0.19)
Left Party	0.14 (0.24)	0.45** (0.19)	0.12 (0.21)	0.30** (0.12)	0.28 (0.32)	0.63*** (0.21)
Green Party	0.18 (0.20)	0.75*** (0.17)	0.16 (0.15)	0.38*** (0.12)	0.04 (0.28)	0.70*** (0.20)
Other parties	0.19 (0.23)	0.10 (0.19)	0.05 (0.17)	0.02 (0.14)	-0.17 (0.29)	0.23 (0.24)
SPD share	2.30 (1.45)	-0.27 (1.32)	-0.85 (1.14)	-2.15** (0.85)	0.42 (1.95)	-1.62 (1.60)
Left Party share	-6.67 (5.78)	5.22 (3.87)	-4.59 (4.43)	3.66 (2.35)	-3.84 (7.71)	2.78 (5.14)
Green Party share	-2.74 (3.34)	4.71** (2.04)	2.53 (2.40)	1.75 (1.34)	-1.00 (3.97)	2.65 (2.57)
Other party shares	3.11 (2.81)	0.68 (3.41)	0.70 (2.47)	0.26 (2.36)	6.72* (3.95)	-2.38 (4.58)
<i>Controls: social interactions</i>						
Voluntarily active	-0.16 (0.13)	0.33*** (0.11)	0.04 (0.10)	0.21*** (0.07)	0.06 (0.17)	0.44*** (0.13)
Environmental organization	0.13 (0.18)	0.29* (0.16)	0.22 (0.14)	0.22** (0.11)	0.31 (0.20)	0.29 (0.18)
Constant	-1.28 (1.98)	-3.43** (1.65)	-1.08 (1.57)	-0.85 (1.06)	-1.38 (3.13)	-0.88 (2.23)
Further controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	121	323	131	358	132	359

The ML parameter estimates in Negbin II regression models (columns 1, 2, 5, and 6), and two Poisson regression models (columns 2 and 3) based on different subsamples: Columns 1, 3, and 5 refer to observations for which 'Religiously active C + P' equals one. Columns 2, 4, and 6 refer to observations for which 'Religiously active C + P' and 'Religiously active others' equal zero. Dependent variables: 'Eco activity index,' 'Eco purchases index,' and 'Social purchases index' are count data variables, number of observations = 121, 323, 131, 358, 132, and 359, respectively. Cluster-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

include the West dummy in the original estimations in order to control for this problem.

Comparison Across Different Behaviors

Finally, this section considers the disaggregated self-reported behaviors separately. We do this as the

construction of indices might cover certain underlying patterns (e.g., Martin and Bateman 2014) and in order to identify which specific fields of self-reported behavior drive the indices. Further, this approach allows us to examine whether the degree of observability plays a role with respect to different behaviors, as discussed before.

Table 7 ML estimates for parameters in ordered probit models for the importance of regional Christian religion on the self-reported consideration of ecological and social criteria in investment decisions by religious activity

Explanatory variables	Eco invest		Social invest	
	(7a)	(7b)	(7c)	(7d)
<i>Individual and regional religiosity</i>				
Share of Catholics	0.82 (2.93)	1.93 (1.84)	0.09 (3.29)	-1.54 (1.80)
Share of Protestants	0.71 (3.25)	2.23 (1.97)	-1.04 (3.67)	-1.63 (1.94)
Share of others	-0.09 (3.54)	2.54 (2.35)	0.25 (4.28)	-2.88 (2.34)
<i>Controls: individual and regional political orientation</i>				
SPD	0.14 (0.24)	0.26* (0.15)	0.23 (0.25)	0.35** (0.15)
Left Party	0.04 (0.47)	0.34 (0.22)	0.33 (0.43)	0.48** (0.21)
Green Party	-0.21 (0.33)	0.56*** (0.19)	-0.28 (0.35)	0.61*** (0.18)
Other parties	0.32 (0.41)	-0.08 (0.19)	-0.33 (0.36)	-0.00 (0.19)
SPD share	2.16 (2.75)	-0.73 (1.29)	2.60 (2.65)	-0.87 (1.30)
Left Party share	4.97 (7.60)	6.56 (4.24)	2.26 (6.37)	5.85 (4.30)
Green Party share	7.17 (4.40)	4.42** (2.16)	8.52** (4.13)	2.89 (2.40)
Other party shares	6.56 (4.53)	-0.82 (3.31)	9.49** (4.69)	-5.49 (3.80)
<i>Controls: social interactions</i>				
Voluntarily active	0.28 (0.20)	0.32** (0.13)	0.29 (0.22)	0.38*** (0.13)
Environmental organization	0.48 (0.31)	0.61*** (0.20)	0.89*** (0.31)	0.34* (0.18)
Further controls	Yes	Yes	Yes	Yes
Observations	131	363	131	366

The ML parameter estimates in four ordered probit models based on different subsamples: Columns 1 and 3 refer to observations for which 'Religiously active C + P' equals one. Columns 2 and 4 refer to observations for which 'Religiously active C + P' and 'Religiously active others' equal zero. Dependent variables: 'Eco invest' and 'Social invest,' number of observations = 131, 363, 131, and 366, respectively. Cluster-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

Based on ML estimates in ordered probit models, Tables 10, 11, and 12 report estimated parameters with respect to the different behaviors we used to construct the different indices. Table 10 refers to the self-reported importance of ecological criteria in purchase decisions, Table 11 refers to the self-reported importance of social criteria in purchase decisions, and Table 12 refers the self-reported importance of ecological criteria in context of other ecological activities. As before, Table 10 shows that

there is no significant relationship between an individual Catholic or Protestant affiliation and the self-reported importance of the consideration of ecological criteria in purchase decisions, which is in line with the results listed in Table 4 for the 'Eco purchases index.' However, hypothesis 1b is partly supported by significantly positive effects for 'Religiously active C + P' in case of purchases of clothes and food (models 10d and 10h). For the same fields of self-reported behavior, we also find that regional

Table 8 ML estimates for parameters in Negbin regression and Poisson regression models for the importance of regional Christian religion on various aggregated measures for self-reported behaviors by individual confession

Explanatory variables	Eco activity index		Eco purchases index		Social purchases index	
	(8a)	(8b)	(8c)	(8d)	(8e)	(8f)
<i>Individual and regional religiosity</i>						
Share of Catholics	4.29** (1.74)	2.21 (1.93)	-0.52 (1.98)	0.75 (1.68)	0.73 (2.91)	0.15 (2.13)
Share of Protestants	5.11*** (1.89)	1.96 (2.11)	-0.73 (2.04)	0.94 (1.69)	0.99 (2.95)	0.82 (2.24)
Share of others	5.34*** (1.88)	3.40 (2.29)	-0.26 (2.46)	1.92 (2.18)	2.57 (0.73)	0.02 (0.15)
<i>Controls: individual and regional political orientation</i>						
SPD	0.55*** (0.18)	-0.29 (0.18)	0.04 (0.14)	-0.06 (0.13)	0.26 (0.21)	-0.16 (0.20)
Left Party	0.99*** (0.31)	0.25 (0.27)	0.58* (0.32)	0.14 (0.24)	0.78 (0.50)	0.35 (0.31)
Green Party	0.45 (0.33)	0.35** (0.17)	0.15 (0.27)	0.16 (0.14)	0.22 (0.41)	0.10 (0.24)
Other parties	-0.10 (0.31)	0.26 (0.23)	-0.47* (0.25)	0.29* (0.16)	-0.71 (0.52)	-0.08 (0.29)
SPD share	-2.58 (2.47)	-0.60 (1.40)	-0.86 (1.52)	-1.55 (1.01)	-1.00 (2.47)	0.39 (1.75)
Left Party share	1.96 (7.86)	4.05 (5.18)	-3.21 (3.91)	-3.51 (4.09)	-2.51 (7.94)	-3.10 (6.41)
Green Party share	3.90 (3.79)	-1.30 (2.55)	-0.99 (2.91)	1.59 (2.03)	-2.01 (4.14)	2.55 (3.05)
Other party shares	-0.05 (4.13)	-8.04*** (3.10)	1.46 (2.78)	-0.37 (3.01)	5.67 (4.51)	4.02 (5.01)
<i>Controls: social interactions</i>						
Voluntarily active	0.11 (0.16)	0.06 (0.14)	0.15 (0.12)	0.15 (0.11)	0.12 (0.18)	0.17 (0.18)
Environmental organization	-0.23 (0.27)	0.34** (0.16)	0.10 (0.15)	0.30** (0.13)	-0.07 (0.22)	0.34* (0.19)
Constant	-3.28 (2.02)	-1.09 (1.97)	1.79 (1.85)	0.33 (1.81)	5.11 (3.36)	-3.07 (2.47)
Further controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	142	164	159	179	158	181

The ML parameter estimates in Negbin II regression models (columns 1, 2, 5, and 6), and two Poisson regression models (columns 2 and 3) based on different subsamples: Columns 1, 3, and 5 refer to observations for which 'Catholic' equals one. Columns 2, 4, and 6 refer to observations for which 'Protestant' equals one. Dependent variables: 'Eco activity index,' 'Eco purchases index,' and 'Social purchases index' are count data variables, number of observations = 142, 164, 159, 179, 158, and 181, respectively. Cluster-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

religion plays an important and positive role supporting hypothesis 2b. Hence, the aforementioned results for the 'Eco purchases index' are mainly driven by a positive relationship for food and for clothes. With respect to the further control variables, the regional share of the Social Democratic Party ('SPD share') has a surprising negative

effect, which we cannot explain at this point. Hence, we leave also this issue for future research.

The in-depth analysis of self-reported pro-social behavior in Table 11 shows that 'Religiously active C + P' significantly positively affects all four fields of behaviors. Thus, we find support for hypothesis 3, although we find no

Table 9 ML estimates for parameters in ordered probit models for the importance of regional Christian religion on the self-reported consideration of ecological and social criteria in investment decisions by individual confession

Explanatory variables	Eco invest		Social invest	
	(9a)	(9b)	(9c)	(9d)
<i>Individual and regional religiosity</i>				
Share of Catholics	1.86 (2.56)	5.74** (2.50)	0.37 (2.78)	4.19 (2.67)
Share of Protestants	1.35 (2.80)	4.18 (2.68)	-1.36 (2.83)	2.92 (2.94)
Share of others	0.99 (3.26)	8.00** (3.31)	0.44 (3.48)	6.48* (3.63)
<i>Controls: individual and regional political orientation</i>				
SPD	0.14 (0.22)	-0.59*** (0.21)	0.32 (0.22)	-0.59*** (0.20)
Left Party	0.14 (0.56)	-0.28 (0.39)	1.11** (0.44)	-0.35 (0.38)
Green Party	0.26 (0.32)	0.00 (0.25)	0.74** (0.37)	-0.21 (0.26)
Other parties	0.20 (0.36)	-0.46 (0.29)	-0.27 (0.34)	-0.34 (0.31)
SPD share	1.94 (2.69)	0.19 (1.83)	1.10 (2.73)	0.13 (1.96)
Left Party share	2.40 (6.98)	6.40 (6.83)	-3.92 (6.58)	3.91 (6.45)
Green Party share	-1.80 (5.24)	3.50 (3.53)	-2.05 (4.91)	-0.55 (3.32)
Other party shares	7.57* (4.52)	-8.00* (4.26)	4.96 (4.48)	-6.82 (4.69)
<i>Controls: social interactions</i>				
Voluntarily active	0.38** (0.18)	0.12 (0.19)	0.23 (0.20)	0.26 (0.19)
Environmental organization	0.46* (0.28)	0.36 (0.26)	0.42 (0.31)	0.29 (0.26)
Further controls	Yes	Yes	Yes	Yes
Observations	155	188	156	187

The ML parameter estimates in four ordered probit models based on different subsamples: Columns 1 and 3 refer to observations for which 'Catholic' equals one. Columns 2 and 4 refer to observations for which 'Protestant' equals one. Dependent variables: 'Eco invest' and 'Social invest,' number of observations = 155, 188, 156, and 187, respectively. Cluster-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

significant effects for the individuals' confession. Additionally, we find rather robust significantly positive effects for the self-reported importance of the consideration of social/ethical criteria in purchase decisions in all areas except clothes, which supports hypothesis 4. Here, particularly the regional share of Protestants seems to be important for these behaviors.

Additionally, Table 12 reveals weakly significantly positive estimates for 'Catholic' in case of three variables that can be interpreted as tourism behavior, namely

'Freq. travel,' 'Freq. flights,' and 'Choice destinations'. Additionally, 'Religiously active C + P' has a significant positive effect on the self-reported importance of ecological criteria of all activities, i.e., strongly supports hypothesis 1b. Regional Christian religion is (like 'Catholic') particularly important in case of travel behavior (i.e., 'Freq. travel,' 'Freq. flights,' and 'Choice destinations'), but also positively related to the self-reported importance of the consideration of ecological criteria in context of the frequency of meat and dairy product

Table 10 ML estimates for parameters in ordered probit models for the importance of individual and regional Christian religion on various disaggregated measures for self-reported ecological behaviors

Explanatory variables	Eco electronic		Eco clothes		Eco car		Eco food	
	(10a)	(10b)	(10c)	(10d)	(10e)	(10f)	(10g)	(10h)
<i>Individual and regional religiosity</i>								
Catholic	0.06 (0.13)	–	0.03 (0.12)	–	0.09 (0.13)	–	0.13 (0.12)	–
Protestant	–0.05 (0.11)	–	–0.03 (0.11)	–	–0.05 (0.12)	–	0.11 (0.11)	–
Other religions	0.23 (0.28)	–	–0.33 (0.24)	–	0.06 (0.29)	–	0.23 (0.22)	–
Religiously active C+P	–	0.11 (0.12)	–	0.25** (0.12)	–	0.17 (0.12)	–	0.30** (0.13)
Religiously active others	–	–0.01 (0.32)	–	–0.60*** (0.21)	–	–0.15 (0.41)	–	0.08 (0.30)
Share of Catholics	1.49 (1.46)	2.17 (1.69)	3.55** (1.46)	3.55** (1.59)	2.40 (1.49)	2.70 (1.73)	2.58* (1.37)	2.71* (1.51)
Share of Protestants	1.38 (1.57)	2.15 (1.84)	3.94** (1.55)	4.01** (1.71)	2.60 (1.61)	2.77 (1.88)	3.02** (1.45)	3.39** (1.59)
Share of others	1.58 (1.88)	2.13 (2.14)	5.04*** (1.94)	5.26** (2.07)	2.49 (1.87)	3.10 (2.16)	3.24* (1.81)	3.16 (1.98)
<i>Controls: individual and regional political orientation</i>								
SPD	0.07 (0.11)	0.23* (0.13)	0.04 (0.11)	0.15 (0.12)	0.09 (0.11)	0.21* (0.12)	0.08 (0.11)	0.17 (0.11)
Left Party	0.06 (0.17)	0.14 (0.18)	0.29* (0.17)	0.38** (0.18)	0.07 (0.18)	0.09 (0.19)	0.27 (0.16)	0.39** (0.17)
Green Party	0.32** (0.15)	0.39** (0.16)	0.27* (0.16)	0.48*** (0.17)	0.24 (0.16)	0.28 (0.19)	0.65*** (0.16)	0.81*** (0.18)
Other parties	–0.02 (0.15)	0.04 (0.16)	–0.07 (0.14)	0.04 (0.16)	–0.13 (0.14)	–0.04 (0.16)	–0.04 (0.15)	0.13 (0.17)
SPD share	–1.34 (0.99)	–1.34 (1.12)	–2.49*** (0.96)	–2.41** (1.04)	–2.54*** (0.96)	–3.01*** (1.06)	–2.70*** (0.94)	–2.81*** (1.02)
Left Party share	1.20 (3.11)	4.30 (3.50)	3.31 (3.11)	3.71 (3.46)	1.70 (3.51)	2.12 (3.88)	3.67 (3.11)	5.25 (3.46)
Green Party share	1.62 (1.68)	1.66 (1.89)	–0.52 (1.81)	–0.35 (2.03)	1.42 (1.71)	0.80 (1.92)	2.80 (1.77)	3.35* (2.02)
Other party shares	0.47 (2.40)	1.22 (2.72)	–2.46 (2.59)	–2.90 (2.87)	–0.69 (2.38)	–1.87 (2.70)	–0.11 (2.49)	–0.04 (2.80)
<i>Controls: social interactions</i>								
Voluntarily active	0.18* (0.09)	0.13 (0.10)	0.21** (0.09)	0.21** (0.11)	0.11 (0.09)	0.11 (0.11)	0.08 (0.09)	0.07 (0.11)
Environmental organization	0.33** (0.15)	0.36** (0.17)	0.25* (0.14)	0.19 (0.16)	0.30** (0.14)	0.34** (0.17)	0.60*** (0.15)	0.57*** (0.17)
Further controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	616	507	617	508	598	490	617	508

The ML parameter estimates in four ordered probit models, dependent variables: ‘Eco electronic’ (columns 1 and 2), ‘Eco clothes’ (columns 3 and 4), ‘Eco car’ (columns 5 and 6), and ‘Eco food’ (columns 7 and 8), number of observations = 616, 507, 617, 508, 598, 490, 617 and 508, respectively. Cluster-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 11 ML estimates for parameters in ordered probit models for the importance of individual and regional Christian religion on various disaggregated self-reported measures for social behaviors

Explanatory variables	Social electronic		Social clothes		Social car		Social food	
	(11a)	(11b)	(11c)	(11d)	(11e)	(11f)	(11g)	(11h)
<i>Individual and regional religiosity</i>								
Catholic	0.15 (0.12)	–	0.04 (0.12)	–	0.16 (0.12)	–	0.12 (0.13)	–
Protestant	0.07 (0.11)	–	0.04 (0.11)	–	0.12 (0.12)	–	0.02 (0.11)	–
Other religions	0.41 (0.29)	–	–0.37 (0.26)	–	0.41* (0.25)	–	0.15 (0.29)	–
Religiously active C+P	–	0.41*** (0.12)	–	0.27** (0.12)	–	0.43*** (0.12)	–	0.33*** (0.12)
Religiously active others	–	0.01 (0.34)	–	–0.63** (0.30)	–	–0.04 (0.41)	–	0.10 (0.39)
Share of Catholics	2.23 (1.46)	2.30 (1.69)	1.68 (1.33)	1.94 (1.53)	2.56* (1.44)	2.75 (1.68)	3.31*** (1.25)	3.61** (1.45)
Share of Protestants	3.06** (1.55)	3.33* (1.80)	1.91 (1.41)	2.46 (1.65)	3.11** (1.53)	3.39* (1.79)	3.95*** (1.31)	4.40*** (1.54)
Share of others	2.54 (1.87)	2.97 (2.17)	2.49 (1.73)	2.80 (1.96)	3.75** (1.83)	4.52** (2.12)	4.18** (1.64)	4.51** (1.87)
<i>Controls: individual and regional political orientation</i>								
SPD	0.16 (0.11)	0.33*** (0.12)	0.15 (0.11)	0.26** (0.12)	0.14 (0.11)	0.30** (0.12)	0.11 (0.12)	0.25** (0.12)
Left Party	0.35** (0.17)	0.44** (0.18)	0.17 (0.17)	0.28 (0.18)	0.26 (0.18)	0.34* (0.19)	0.27* (0.16)	0.39** (0.17)
Green Party	0.26* (0.15)	0.37** (0.16)	0.26* (0.14)	0.40*** (0.16)	0.24 (0.16)	0.34** (0.17)	0.33** (0.16)	0.54*** (0.17)
Other parties	0.08 (0.15)	0.16 (0.16)	–0.05 (0.14)	0.04 (0.16)	0.03 (0.14)	0.14 (0.15)	–0.07 (0.14)	0.10 (0.16)
SPD share	–1.68* (0.97)	–2.27** (1.09)	–0.64 (0.98)	–1.30 (1.08)	–0.65 (0.99)	–1.33 (1.12)	–1.96** (0.97)	–2.81*** (1.06)
Left Party share	2.18 (3.18)	4.32 (3.57)	0.04 (3.06)	1.74 (3.67)	0.21 (3.20)	1.40 (3.65)	5.84* (3.13)	6.94* (3.71)
Green Party share	0.84 (1.79)	0.72 (2.03)	1.34 (1.69)	2.57 (1.93)	0.06 (1.78)	–0.64 (2.06)	0.47 (1.79)	0.82 (2.04)
Other party shares	3.28 (2.69)	1.35 (3.09)	2.07 (2.46)	0.86 (2.78)	4.12 (2.70)	1.70 (3.06)	2.00 (2.58)	1.01 (2.91)
<i>Controls: social interactions</i>								
Voluntarily active	0.32*** (0.09)	0.32*** (0.10)	0.36*** (0.09)	0.39*** (0.10)	0.28*** (0.09)	0.26** (0.10)	0.21** (0.09)	0.20* (0.10)
Environmental organization	0.39** (0.16)	0.34** (0.17)	0.25* (0.13)	0.23 (0.14)	0.14 (0.14)	0.10 (0.16)	0.54*** (0.14)	0.58*** (0.16)
Further controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	615	507	615	507	598	491	615	507

The ML parameter estimates in four ordered probit models, dependent variables: ‘Social electronic’ (columns 1 and 2), ‘Social clothes’ (columns 3 and 4), ‘Social car’ (columns 5 and 6), and ‘Social food’ (columns 7 and 8), number of observations = 615, 507, 615, 507, 598, 491, 615 and 507, respectively. Cluster-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 12 ML estimates for parameters in ordered probit models for the importance of individual and regional Christian religion on various disaggregated measures for self-reported social behaviors

Explanatory variables	Choice transport		Freq. car		Freq. travel		Freq. flights		Choice destinations		Freq. meat and milk	
	(12a)	(12b)	(12c)	(12d)	(12e)	(12f)	(12g)	(12h)	(12i)	(12j)	(12k)	(12l)
<i>Individual and regional religiosity</i>												
Catholic	0.13 (0.12)	–	0.09 (0.12)	–	0.22* (0.12)	–	0.22* (0.12)	–	0.30** (0.12)	–	0.15 (0.12)	–
Protestant	0.04 (0.12)	–	0.02 (0.12)	–	–0.07 (0.11)	–	0.13 (0.12)	–	0.08 (0.12)	–	0.17 (0.11)	–
Other religions	–0.55** (0.26)	–	0.15 (0.30)	–	0.13 (0.35)	–	–0.47** (0.21)	–	0.19 (0.30)	–	0.22 (0.25)	–
Religiously active C+P	–	0.51*** (0.13)	–	0.27** (0.13)	–	0.27** (0.13)	–	0.39*** (0.13)	–	0.36*** (0.12)	–	0.42*** (0.12)
Religiously active others	–	–0.65* (0.33)	–	0.34 (0.42)	–	–0.09 (0.38)	–	–0.67*** (0.17)	–	0.26 (0.42)	–	0.29 (0.34)
Share of Catholics	1.40 (1.43)	1.16 (1.59)	0.50 (1.50)	0.18 (1.71)	3.30** (1.44)	3.80** (1.59)	3.49** (1.36)	3.26** (1.51)	2.61* (1.47)	2.44 (1.65)	1.88 (1.27)	2.44* (1.38)
Share of Protestants	1.09 (1.52)	0.64 (1.72)	0.52 (1.61)	0.16 (1.86)	3.75** (1.54)	3.87** (1.71)	3.73** (1.46)	3.30** (1.64)	3.60** (1.59)	3.27* (1.78)	2.38* (1.37)	3.18** (1.48)
Share of others	1.42 (1.81)	1.34 (1.98)	1.12 (1.93)	0.62 (2.16)	4.51** (1.83)	5.04** (2.03)	3.99** (1.73)	3.57* (1.92)	3.54* (1.87)	2.98 (2.11)	2.88* (1.65)	3.36* (1.80)
<i>Controls: individual and regional political orientation</i>												
SPD	0.06 (0.11)	0.13 (0.12)	0.12 (0.11)	0.23** (0.12)	0.24** (0.12)	0.28** (0.13)	0.17 (0.12)	0.19 (0.13)	0.05 (0.11)	0.07 (0.12)	0.13 (0.11)	0.21* (0.12)
Left Party	0.23 (0.17)	0.28 (0.17)	0.09 (0.18)	0.18 (0.18)	0.31* (0.17)	0.27 (0.17)	0.20 (0.17)	0.19 (0.16)	0.41** (0.18)	0.47*** (0.18)	0.37** (0.18)	0.54*** (0.19)
Green Party	0.67*** (0.15)	0.82*** (0.17)	0.58*** (0.16)	0.74*** (0.18)	0.65*** (0.15)	0.76*** (0.16)	0.58*** (0.15)	0.67*** (0.17)	0.48*** (0.15)	0.62*** (0.16)	0.48*** (0.14)	0.68*** (0.16)
Other parties	0.03 (0.15)	0.10 (0.16)	–0.07 (0.15)	0.03 (0.17)	0.07 (0.15)	–0.01 (0.16)	0.07 (0.14)	0.05 (0.16)	–0.03 (0.15)	–0.01 (0.17)	–0.05 (0.14)	0.09 (0.16)
SPD share	0.21 (0.99)	0.51 (1.11)	0.07 (1.06)	0.15 (1.18)	–1.05 (0.98)	–0.88 (1.08)	–1.32 (0.94)	–1.28 (1.04)	–2.74*** (0.97)	–2.02* (1.05)	–2.59** (1.06)	–2.74** (1.15)
Left Party share	6.31** (3.10)	5.80* (3.45)	5.15 (3.26)	3.92 (3.68)	0.94 (2.97)	2.67 (3.31)	3.75 (3.07)	5.84* (3.07)	2.71 (3.14)	3.88 (3.68)	2.57 (2.97)	3.39 (3.35)
Green Party share	6.07*** (1.87)	6.10*** (2.05)	1.80 (1.77)	1.58 (2.04)	0.88 (1.65)	1.86 (1.81)	0.40 (1.62)	0.85 (1.84)	1.14 (1.66)	2.56 (1.88)	1.25 (1.78)	1.15 (1.99)
Other party shares	–0.49 (2.38)	–0.25 (2.71)	1.43 (2.59)	1.13 (2.88)	–0.29 (2.29)	1.41 (2.62)	–2.78 (2.43)	–0.84 (2.73)	–1.80 (2.33)	0.31 (2.73)	–1.59 (2.43)	–1.47 (2.77)
<i>Controls: social interactions</i>												
Voluntarily active	0.30*** (0.09)	0.24** (0.10)	0.24** (0.10)	0.23** (0.11)	0.27*** (0.09)	0.22** (0.10)	0.08 (0.09)	0.02 (0.10)	0.20** (0.09)	0.20** (0.10)	–0.00 (0.09)	–0.04 (0.11)
Environmental organization	0.21 (0.13)	0.19 (0.14)	0.25* (0.15)	0.18 (0.17)	0.45*** (0.15)	0.48*** (0.17)	0.32** (0.14)	0.33** (0.15)	0.34** (0.13)	0.31** (0.14)	0.32** (0.14)	0.26 (0.16)
Further controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	612	505	570	465	611	504	590	488	610	503	615	507

The ML parameter estimates in four ordered probit models, dependent variables: ‘Choice transport’ (columns 1 and 2), ‘Freq. car’ (columns 3 and 4), ‘Freq. travel’ (columns 5 and 6), ‘Freq. flights’ (columns 7 and 8), ‘Choice destinations’ (columns 9 and 10), and ‘Freq. meat and milk’ (columns 11 and 12), number of observations = 612, 505, 570, 465, 611, 504, 590, 488, 610, 503, 615, and 507, respectively. Cluster-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

consumption. The latter result is in line with those for ‘Eco food’ reported in Table 10. In sum, we find strong support for a strong positive effect of Christian religion in almost all fields of consumption and activities.

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, as mentioned in footnote 23, instead of using univariate ordered probit models, we applied multivariate ordered probit models, but also multivariate and univariate binary probit models. Corresponding (test) statistics clearly underline the superiority of multivariate models, but results were very similar. Hence, for the purpose of enhancing readability, we only consider the less sophisticated approach in the main analyses. Further, if we would consider binary dependent variables instead, 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.

Conclusion and Discussion

This exploratory study empirically analyzes the relationship between measures for individual and regional Christian religion and religiosity and the self-reported importance of the consideration of ecological and social/ethical criteria in context of a wide variety of individual activities, especially consumption and investment decisions, of financial decisions makers in German households. Hence, this study focuses on 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 proportions of religious affiliations (and measures for regional political orientations).

Hence, this paper examines the role of individual and regional Christian religion in context of (self-reported) sustainable behaviors and thus provides empirical evidence for at least three research fields, namely research on the relationship between individual identity and contextual social norms, non-financial motives for SRI, but also in the area of religious economics. Thus, we help to close several research gaps, as only very few studies empirically analyzed these relationships in other countries than the USA. As by-product, we also consider the effect of regional political orientation as another example for a contextual factor.

The core results indicate that individual and regional Christian religion and religiosity are mainly positively related to self-reported importance of sustainable criteria in context of several behaviors, such pro-environmental or pro-social purchases of food, clothes, cars, or in investment decisions. Thus, we rather find empirical support for the stewardship hypothesis or alternative explanations for a positive relationship between Christian religion and pro-environmental activities than for White’s (1967) dominion hypothesis. Further, we see that religious contextual effects are particularly important for religiously active Catholics and Protestants, whereas political contextual factors are rather important for non-religiously active persons. We additionally see that these factors positively affect different

behaviors independently of their degree of observability or importance in terms of irreversibility. Our results indicate that religious values are obviously important in a country like Germany, although, contrarily to the USA, the number of members of Christian Churches has 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 (see, e.g., Benjamin et al. 2016). 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 is 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, we also find unexpected results, i.e., the negative relationship between the share of votes for the Social Democratic Party ('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 region. 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 while 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.

Finally, due to data limitations we cannot directly identify the mechanisms and reasons underlying the positive relationship between Christian religion and self-reported consideration of ecological or social/ethical criteria in the different fields we considered. Hence, future research should particularly refer to issues like biblical literacy, measures for religious conservatism, or directly address motives based on the dominion or stewardship hypothesis, as also partly done by Pepper and Leonard (2016) in case of Australian churchgoers. Economic studies should therefore consider previous research in sociological studies, which already raised these issues (e.g., Pepper and Leonard 2016).

Acknowledgements For this project, we received a contribution by the Regional Office in Hesse of the Deutsche Bundesbank, which was used to finance part of the survey costs.

Compliance with Ethical Standards

Conflict of interest There are no conflicts of interest to disclose.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Appendix

See Table 13.

Table 13 Correlation matrix of all items used to construct the three indices used as dependent variables in the empirical analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Eco electronic (1)	1.0000															
Eco clothes (2)	0.4743	1.0000														
Eco car (3)	0.6546	0.4519	1.0000													
Eco food (4)	0.3931	0.6364	0.4175	1.0000												
Eco invest (5)	0.2827	0.4201	0.2933	0.3873	1.0000											
Social electronic (6)	0.4885	0.5994	0.4511	0.4684	0.4409	1.0000										
Social clothes (7)	0.4160	0.6758	0.4185	0.5248	0.3854	0.6796	1.0000									
Social car (8)	0.4262	0.5510	0.5310	0.4434	0.4510	0.8335	0.6225	1.0000								
Social food (9)	0.3627	0.6080	0.3649	0.6552	0.3916	0.6289	0.7007	0.6138	1.0000							
Social invest (10)	0.3031	0.4505	0.3115	0.3913	0.7566	0.4971	0.4692	0.4744	0.4645	1.0000						
Choice transport (11)	0.3140	0.3944	0.4030	0.3609	0.3647	0.3503	0.3612	0.3915	0.3479	0.3402	1.0000					
Freq. car (12)	0.2952	0.4148	0.3668	0.3682	0.3392	0.3541	0.3344	0.3981	0.3479	0.3062	0.6292	1.0000				
Freq. travel (13)	0.3212	0.4521	0.3841	0.4173	0.4260	0.4150	0.4087	0.4519	0.3479	0.3732	0.4784	0.5022	1.0000			
Freq. flights (14)	0.3035	0.3914	0.3607	0.3530	0.3438	0.3729	0.3672	0.3938	0.3504	0.4059	0.4213	0.4019	0.6048	1.0000		
Choice destinations (15)	0.3253	0.4796	0.3479	0.4579	0.4023	0.4367	0.4171	0.4483	0.4303	0.3703	0.4357	0.4536	0.6981	0.6066	1.0000	
Freq. meat and milk (16)	0.2914	0.4925	0.3628	0.5579	0.3250	0.4313	0.4594	0.4111	0.5062	0.3218	0.4111	0.3848	0.4584	0.3844	0.4590	1.0000

References

- Ai, C., & Norton, E. C. (2003). Interaction terms in logit and probit models. *Economics Letters*, 80(1), 123–129. doi:10.1016/S0165-1765(03)00032-6.
- Akerlof, G. A., & Kranton, R. E. (2000). Economics and Identity. *The Quarterly Journal of Economics*, 115(3), 715–753.
- Akerlof, G. A., & Kranton, R. E. (2010). *Identity economics: How our identities shape our work, wages, and well-being*. Princeton: Princeton University Press.
- Andorfer, V. A. (2013). Ethical consumption in Germany. *Zeitschrift für Soziologie*, 42(5), 424–443.
- Andorfer, V. A., & Liebe, U. (2012). Research on fair trade consumption—A review. *Journal of Business Ethics*, 106(4), 415–435.
- Andreoni, J., Payne, A. A., Smith, J., & Karp, D. (2016). Diversity and donations: The effect of religious and ethnic diversity on charitable giving. *Journal of Economic Behavior & Organization*, 128, 47–58.
- Arruñada, B. (2010). Protestants and Catholics: Similar work ethic, different social ethic. *The Economic Journal*, 120(547), 890–918.
- Axsen, J., TyreeHageman, J., & Lentz, A. (2012). Lifestyle practices and pro-environmental technology. *Ecological Economics*, 82, 64–74.
- Bauer, R., & Smeets, P. (2015). Social identification and investment decisions. *Journal of Economic Behavior & Organization*, 117, 121–134.
- Bénabou, R., & Tirole, J. (2010). Individual and corporate social responsibility. *Economica*, 77(305), 1–19.
- Benjamin, D. J., Choi, J. J., & Fisher, G. (2016). Religious identity and economic behavior. *The Review of Economics and Statistics*, 98(4), 617–637.
- Benjamin, D. J., Choi, J. J., & Strickland, A. J. (2010). Social identity and preferences. *American Economic Review*, 100(4), 1913–1928.
- Blasch, J., & Farsi, M. (2014). Context effects and heterogeneity in voluntary carbon offsetting—A choice experiment in Switzerland. *Journal of Environmental Economics and Policy*, 3(1), 1–24.
- Borgers, A., Derwall, J., Koedijk, K., & Ter Horst, J. (2015). Do social factors influence investment behavior and performance? Evidence from mutual fund holdings. *Journal of Banking & Finance*, 60, 112–126.
- Brown, J. R., Ivkovic, Z., Smith, Paul A., & Weisbenner, S. (2008). Neighbors matter: Causal community effects and stock market participation. *The Journal of Finance*, 63(3), 1509–1531.
- Carlsson, F., García, J. H., & Löfgren, Å. (2010). Conformity and the demand for environmental goods. *Environmental & Resource Economics*, 47(3), 407–421.
- Clark, C. F., Kotchen, M. J., & Moore, M. R. (2003). Internal and external influences on pro-environmental behavior: Participation in a green electricity program. *Journal of Environmental Psychology*, 23(3), 237–246.
- Costa, D. L., & Kahn, M. E. (2013). Do liberal home owners consume less electricity? A test of the voluntary restraint hypothesis. *Economics Letters*, 119(2), 210–212.
- Cui, J., Jo, H., & Velasquez, M. G. (2015). The influence of Christian religiosity on managerial decisions concerning the environment. *Journal of Business Ethics*, 132(1), 203–231.
- Czajkowski, M., Hanley, N., & Nyborg, K. (2017). Social norms, morals and self-interest as determinants of pro-environment behaviours: The case of household recycling. *Environmental & Resource Economics*, 66(4), 647–670. doi:10.1007/s10640-015-9964-3.

- Dastrup, S. R., Graff Zivin, J., Costa, D. L., & Kahn, M. E. (2012). Understanding the Solar Home price premium: Electricity generation and “Green” social status. *European Economic Review*, 56(5), 961–973.
- Delmas, M. A., & Lessem, N. (2014). Saving power to conserve your reputation? The effectiveness of private versus public information. *Journal of Environmental Economics and Management*, 67(3), 353–370.
- Derwall, J., Koedijk, K., & Ter Horst, J. (2011). A tale of values-driven and profit-seeking social investors. *Journal of Banking & Finance*, 35(8), 2137–2147.
- Di Giuli, A., & Kostovetsky, L. (2014). Are red or blue companies more likely to go green? Politics and corporate social responsibility. *Journal of Financial Economics*, 111(1), 158–180.
- Doran, C. J., & Natale, S. M. (2011). *ἐμπάθεια* (Empatheia) and Caritas: The role of religion in fair trade consumption. *Journal of Business Ethics*, 98(1), 1–15.
- Dunlap, R. E., & McCright, A. M. (2008). A widening gap: Republican and democratic views on climate change. *Environment: Science and Policy for Sustainable Development*, 50(5), 26–35.
- EKD. (2013). *Leitfaden für ethisch nachhaltige Geldanlage*. Hannover.
- Fama, E. F., & French, K. R. (2007). Disagreement, tastes, and asset prices. *Journal of Financial Economics*, 83(3), 667–689.
- Farrell, J. (2013). Environmental activism and moral schemas: Cultural components of differential participation. *Environment and Behavior*, 45(3), 399–423. doi:10.1177/0013916511422445.
- Georgarakos, D., & Pasini, G. (2011). Trust, Sociability, and Stock Market Participation. *Review of Finance*, 15, 693–725.
- Greeley, A. (1993). Religion and attitudes toward the environment. *Journal for the Scientific Study of Religion*, 32(1), 19–28.
- Greene, W. (2010). Testing hypotheses about interaction terms in nonlinear models. *Economics Letters*, 107(2), 291–296. doi:10.1016/j.econlet.2010.02.014.
- Hong, H., & Kostovetsky, L. (2012). Red and blue investing: Values and finance. *Journal of Financial Economics*, 103(1), 1–19.
- Hong, H., Kubik, J. D., & Stein, J. C. (2004). Social interaction and stock-market participation. *The Journal of Finance*, 59(1), 137–163.
- Hood, M., Nofsinger, J. R., & Varma, A. (2014). Conservation, discrimination, and salvation: Investors’ social concerns in the stock market. *Journal of Financial Services Research*, 45(1), 5–37.
- Iannaccone, L. R. (1998). Introduction to the economics of religion. *Journal of Economic Literature*, 36(3), 1465–1495.
- infratest dimap. (2013). ARD-DeutschlandTREND Dezember 2013. Retrieved September 27, 2016 from <http://www.infratest-dimap.de/umfragen-analysen/bundesweit/ard-deutschlandtrend/2013/dezember/>.
- infratest dimap. (2015). AfD rückt nach rechts, CDU nach links. Retrieved August 15, 2016 from http://www.infratest-dimap.de/uploads/media/LinksRechts_Nov2015_01.pdf.
- Kahn, M. E. (2007). Do greens drive hummers or hybrids? Environmental ideology as a determinant of consumer choice. *Journal of Environmental Economics and Management*, 54(2), 129–145.
- Kotchen, M. J., & Moore, M. R. (2008). Conservation: From voluntary restraint to a voluntary price premium. *Environmental & Resource Economics*, 40(2), 195–215.
- Kumar, A., & Page, J. K. (2014). Deviations from norms and informed trading. *Journal of Financial and Quantitative Analysis*, 49(04), 1005–1037.
- Kumar, A., Page, J. K., & Spalt, O. G. (2011). Religious beliefs, gambling attitudes, and financial market outcomes. *Journal of Financial Economics*, 102(3), 671–708.
- Martin, W. C., & Bateman, C. R. (2014). Consumer religious commitment’s influence on ecocentric attitudes and behavior. *Journal of Business Research*, 67(2), 5–11.
- Nilsson, J. (2008). Investment with a conscience: Examining the impact of pro-social attitudes and perceived financial performance on socially responsible investment behavior. *Journal of Business Ethics*, 83(2), 307–325.
- Pepper, M., & Leonard, R. (2016). How ecotheological beliefs vary among Australian churchgoers and consequences for environmental attitudes and behaviors. *Review of Religious Research*, 58(1), 101–124. doi:10.1007/s13644-015-0234-1.
- Renneboog, L., & Spaenjers, C. (2012). Religion, economic attitudes, and household finance. *Oxford Economic Papers*, 64(1), 103–127.
- Renneboog, L., Ter Horst, J., & Zhang, C. (2008). Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of Banking & Finance*, 32(9), 1723–1742.
- Riedl, A., & Smeets, P. (2014). Social preferences and portfolio choice. *CESifo working paper* (4403).
- Salaber, J. (2013). Religion and returns in Europe. *European Journal of Political Economy*, 32, 149–160.
- Schumacher, I. (2014). An Empirical Study of the Determinants of Green Party Voting. *Ecological Economics*, 105, 306–318.
- Schwirplies, C., & Ziegler, A. (2016). Offset carbon emissions or pay a price premium for avoiding them? A cross-country analysis of motives for climate protection activities. *Applied Economics*, 48(9), 746–758.
- Sherkat, D. E., & Ellison, C. G. (2007). Structuring the religion-environment connection: Identifying religious influences on environmental concern and activism. *Journal for the Scientific Study of Religion*, 46(1), 71–85.
- Statistische Ämter des Bundes und der Länder. (2016). Regionalatlas Deutschland: Indikatoren des Themenbereichs “Bundestagswahl”. Retrieved August 15, 2016 from https://www.regionalstatistik.de/genesis/online/data.jsessionid=111131473F2234CB37AD7136D9E32F31?operation=begriffsRecherche&suchanweisung_lan_guage=de&suchanweisung=Bundestagswahl.
- Statistisches Bundesamt. (2013). Zensus 2011: Erste Ergebnisse des Zensus 2011 nach verschiedenen Merkmalen wie z.B. Bildung, Erwerbstätigkeit, Migration und Religion für Kreise und kreisfreie Städte bzw. Bundesländer.
- Stern, P. C., Dietz, T., & Guagnano, G. A. (1995). The new ecological paradigm in socio-psychological context. *Environment and Behavior*, 27(6), 723–743.
- Thüringer Landesamt für Statistik. (2016). Bundestagswahl 2013 in Thüringen. Retrieved August 16, 2016 from <http://www.wahlen.thueringen.de/datenbank/wahl1/wahl.asp?wahlart=BW&wJahr=2013&zeigeErg=LK>.
- UNFCCC. (2015). Paris Agreement. Retrieved August 16, 2016 from http://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.
- Unsworth, K. L., & Fielding, K. S. (2014). It’s political: How the salience of one’s political identity changes climate change beliefs and policy support. *Global Environmental Change*, 27, 131–137.
- Videras, J., Owen, A. L., Conover, E., & Wu, S. (2012). The influence of social relationships on pro-environment behaviors. *Journal of Environmental Economics and Management*, 63(1), 35–50.
- Weber, M. (1930). *The protestant ethic and the spirit of capitalism* (2nd ed.). London: Allen and Unwin.
- Welch, M. R., Tittle, C. R., & Petee, T. (1991). Religion and deviance among adult Catholics: A test of the “moral communities” hypothesis. *Journal for the Scientific Study of Religion*, 30(2), 159–172.
- Welsch, H., & Kühling, J. (2009). Determinants of pro-environmental consumption: The role of reference groups and routine behavior. *Ecological Economics*, 69(1), 166–176.

- White, L. (1967). The historical roots of our ecologic crisis. *Science*, 155(3767), 1203–1207.
- Winkelmann, R., & Boes, S. (2009). *Analysis of microdata*. Berlin: Springer.
- Wins, A., & Zwergel, B. (2016). Comparing those who do, might and will not invest in sustainable funds: A survey among German retail fund investors. *Business Research*, 9(1), 51–99.
- Wolkomir, M., Futreal, M., Woodrum, E., & Hoban, T. (1997). Substantive religious belief and environmentalism. *Social Science Quarterly*, 78(1), 96–108.
- ZdK. (2015). *Ethisch-nachhaltig investieren*. Neunkirchen. Retrieved September 13, 2016. Accessed 13 September 2016.
- Ziegler, A. (2013). Disentangling technological innovations: A micro-econometric analysis of their determinants. *Journal of Environmental Planning and Management*, 58(2), 315–335.
- Ziegler, A. (2015). On the relevance of ideological identification and environmental values for beliefs and attitudes toward climate change: A empirical cross country analysis. *MAGKS joint discussion paper series in economics* (16-2015).

Reproduced with permission of copyright owner. Further reproduction prohibited without permission.