

Pensions and Investments:

Social and Environmental Preferences of Beneficiaries, and Financial Illiteracy

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Abstract

Institutional investors invest billions of dollars on behalf of investors whilst knowing little about investors' social values. Using survey data from a customized wave of the Dutch CentERdata panel for citizens who are obliged to participate in a pension plan, we find significant variation in stated preferences towards proposed social investment screens. Although individuals are able to express their preferences towards social investment criteria they are not able to translate these values into investment decisions consistently. This is partially driven by the low financial sophistication of households. To emphasize the importance of these findings we show that the majority of beneficiaries derive positive utility from environmental and social pension investment screens and that expressing a preference towards screened pension investments is the most important driver of this effect.

Keywords: Social values; Fiduciary duty; Financial literacy; Pension funds. JEL Classification: G23; H4; I22

1. Introduction

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There has been an increasing interest in the effects of social values on investment behavior and decision making. In this paper we empirically test whether the utility obtained from investing in socially responsible pension investments is significantly positive. If so, pension funds face the challenge of implementing a responsible investment strategy on behalf of their beneficiaries. If this is the case, we first need to investigate if and to what extent individuals value social responsibility in their pension investments because beneficiaries do not have full information on and control over their pension investments. At the same time the pension funds have significant market power.

The rationale behind the introduction of more socially responsible pension products initiates in the observation that people are increasingly buying socially responsible products. The market share of green energy in the Netherlands has risen from below 2% in 1990 to over 11% in 2008¹. The UK Fair-trade foundation² claims to have labeled over 3000 products as Fair trade in 2011. From 2009 onwards more than 100 million pounds of Fair Trade certified coffee was imported into the US alone of which 62% was organic³. These numbers reveal non-ignorable preferences towards socially responsible consumer product features.

Nevertheless, the current economic literature on pensions focuses on risk and return. Utility from non-pecuniary aspects is largely left out of consideration while the pension fund managers should maximize the utility of their beneficiaries. If individuals on average derive positive utility from more socially responsible pension investments, pension fund managers should incorporate these values of their beneficiaries into their investment schemes. This is not an easy task, Barber (2007) points out: “Once considerations other than wealth maximization are relevant for investors, aligning the interests of portfolio managers and investors becomes extremely difficult”. Think about regulatory difficulties concerning heterogeneous preferences (Richardson 2011) or the interpretation of fiduciary duties (Richardson 2007, 2009). However, these difficulties cannot be an argument to refrain from taking environmental and social preferences into account at all.

¹ <http://www.eia.gov>

² <http://www.fairtrade.org.uk>

³ http://www.transfairusa.org/sites/default/files/Almanac%202010_0.pdf

Despite theoretical difficulties, we have seen in practice that tobacco stocks are excluded from investment portfolios in the US (e.g. CalPERS, LA, Seattle, Chicago, and NY pension fund), some of these funds also exclude assault weapon related companies, or companies with business in Sudan. A number of Northern European pension funds have committed to responsible investment practices like the exclusion of cluster bomb manufacturers. The two largest pension funds in the Netherlands (ABP and PGGM) divested Walmart in 2013 due to unsuccessful engagement with the firm concerning questionable employee relations. These examples show that pension funds do take into account social responsibility, although, these practices are also highly debated. Restrictions on the investable universe can harm risk adjusted returns which is not in line with the fiduciary duty of pension funds and the beneficiaries within funds have different social preferences which can lead to protests⁴.

The examples above show that some pension funds take social preferences into account in pension fund investments. However, in the conventional pension fund setting, participants do not invest themselves. Pension funds fulfill a fiduciary role in that they invest on behalf of their participants. Because the participants have very limited power to influence the investment decisions of fund managers and the mandates dictate fund managers to invest prudently (meaning highest possible return for lowest possible risk) there is an inherent agency problem whenever a socially desired investment choice would have a negative impact on expected returns. For this reason it is important to understand if beneficiaries want their money to be invested more in line with their social preferences. The first aim of this paper is to reveal the preferences towards social responsibility in pension investments.

Taking preferences into account makes the investment strategies of fund managers extremely difficult due to heterogeneity (Barber 2007). A straightforward solution would be to give beneficiaries greater freedom of choice or even full investor autonomy. This is only possible if investors are

⁴ E.g. when two Dutch pension funds (PGGM and ABP) donated 1.5 million Euro to IFKO (an international fund for vulnerable elderly) after the tsunami of 2004, complaints were made by their beneficiaries in different types of media. They did not want the pension fund to decide *how* their money should be donated.

financially responsible and capable of making sound financial decisions. Our second aim is to understand to what degree beneficiaries are able to translate their stated preferences into financial decisions.

Using unique field data on Dutch households from CentERdata that was gathered in the first quarter of 2011 we are the first to investigate environmental and social preferences of pension fund beneficiaries. We investigate the extent to which beneficiaries claim to value several environmental and social characteristics of companies and test if they are able to translate these preferences into financial decisions consistently. Subsequently we validate our findings by looking into the effects of social and environmental screening on utility. Our contributions can be separated into three categories.

First, we show what social responsibility practices are valued most by Dutch household members in 2011. In contrary to the conventional practice in the US it would not be optimal to exclude the sin companies (alcohol, tobacco, and gambling) from pension investments. On average, the Dutch favor the exclusion of companies that violate human rights and companies operating in the weapons industry. Although there are some commonalities, there is significant variation in the preferences of the beneficiaries. To validate the preference levels we show that the respondents were able to express their preferences towards social responsibility screens as their self assessed levels correspond with their daily behavior.

Second, we report that the respondents experience difficulties in translating these preferences into financial decisions consistently. Specifically, over one third of the respondents reported inconsistencies in the way they take their preferences into account when making financial decisions. We show that these inconsistencies are partially explained by low levels of financial understanding.

Third, to measure the effect of socially responsible investment screening on utility we examine willingness to pay and find that around three quarters of the respondents are willing to give up pension income to get their investments more in line with their social and environmental preferences. The likelihood to be willing to pay is lower for men, and rises in education, income, and especially in having a preference for social and environmental screening, the latter leads to a 40%

increase in willingness to sacrifice pension income. These preferences are not easily explained, however, results lead us to advice pension funds to reveal social and environmental preferences by directly engaging with beneficiaries.

Our research suggests a number of important points for policymakers and pension funds which should optimally execute their fiduciary duty. Finally, the paper can help ethical investment funds to identify potential customers.

The organization of the paper is as follows. In Section 2, we show that the literature finds that people do not only wish to maximize wealth but are likely to value social aspects in their pension investments. We question if respondents might even *want* to give up income for the socially responsible dimension in their pension, though, individuals are likely to have heterogeneous preferences. The final part of Section 2 explains that the low financial literacy of household members imposes restrictions on the degree of pension portfolio customization. Section 3 presents and describes the data used. Section 4 presents tests on values and financial decision making. The fifth Section validates the paper by showing that beneficiaries on average have utility defined over the level of social responsibility in their pension investments. Section 6 provides a discussion and Section 7 concludes.

2. Theory

2.1 Social values and markets

Two types of value drivers seemingly unrelated to financial markets at first glance are religion and political affiliation. Renneboog and Spaenjers (2011) look into the relation between religion and household financing decisions. Their results suggest that Catholics have a higher propensity to save and participate less on the stock market. Kumar et al. (2010) show that financial markets in the US are tilted towards more gambling alike products (like small institutions holding stocks with lottery like characteristics, or option based compensation schemes for employees) in areas with relatively more Catholics than Protestants. Hong and Kostovetsky (2011) find that political values have an effect on the holdings of mutual fund managers. Managers who are net democrat donors invest less in socially

irresponsible industries compared to republican or non-donors. Whilst these findings suggest that social preferences play an important part in investment decisions of households and institutional investors, little is known empirically of how social responsibility and environmental values translate into investment decisions of beneficiaries.

In the mutual funds literature, a few studies show that investors gain non-pecuniary benefits from investing in socially responsible investments. From ownership studies we know that such investors are less focused on past return performance (e.g. Renneboog et al. 2011). In addition, recent survey studies find different investor segments that range from pure wealth maximizing investors to investors who are primarily concerned with their personal social preferences (e.g. Nilsson 2009, Bauer and Smeets 2010).⁵

In sum, research showed that values influence financial decisions in multiple ways. This implies that, if utility is defined over social preferences, we expect to see variation in values towards more socially responsible pension investments. This leads to our first hypothesis.

H1: Beneficiaries have heterogeneous preferences towards socially responsible pension investments.

2.2 Willingness to give up pension income

For social choices to be reflected into investments, fund managers need to collect information on the firms' activities and the values of the individuals and try to take the values into account in the best possible way. Given the values of the beneficiaries, the manager can either screen companies and/or engage with companies to change their corporate behavior. For simplicity we will focus on screening throughout the paper.

Screening is selecting companies to invest in for instance based on social or environmental performance measures. The investment literature reports mixed results for the effects of screening on returns. In theory the screening process itself is costly and in addition limiting the investment space

⁵ See Derwall et al. 2011 for a more elaborate summary of market segmentation among socially responsible investors.

might harm returns (Hong & Kacperczyk 2009, and Statman & Glushkov 2009). However, some papers do show that companies that engage in different forms of social responsibility beat their benchmarks in the stock market but only for specific screens (e.g. Derwall et al. 2005, Kempf & Osthoff 2007). However, Borgers et al. (2013) show that these positive effects vanish in the long term as attention for social and environmental business practices increases.

We assume that pension fund managers (try to) maximize returns within the freedom of their mandates. The mandates make sure that the investments comply with pre specified demands of governments and other stakeholders. This means that if the pension investments are further screened on social issues the investment performance will at best be the same as in the current situation since screening will limit the investment space⁶. Therefore it is important to know if participants are willing to give up part of their pension income to align the pension investments with their social values. Though, investigating willingness to pay for socially responsible pension products will reflect a worst case scenario since the screening costs are likely to be negligible for individual pension beneficiaries.

An analogous way of viewing this is to test the theory of warm-glow investment decisions. Andreoni & Miller (2002) show in an experiment that only a quarter of the investigated population is identified as a money-maximizer which implies that three quarters do give up income for non-pecuniary utility. Taking this theory outside an experimental setting, it is reported that significant segments of consumers are readily willing to pay for non-product environmental (Laroche et al., 2001) or ethical (Auger et al., 2003) features. Because the purchasing content differs and the amounts invested are enormous it is relevant to investigate if pension beneficiaries gain utility from incorporating their values into their pension investments. This leads to our second hypothesis.

⁶ The same reasoning can be applied for engagement strategies. If engagement adds to the risk return performance of the pension investments, the manager should already be doing this. If not this means that the engagement will be costly and results in no or a negative change in financial performance (assuming that the manager maximizes returns).

H2: Considerable segments of beneficiaries are willing to give up pension income to make their pension investments more aligned with their social preferences.

2.3 Financial literacy and socially responsible investing

If beneficiaries derive positive utility from more socially responsible pension investments and the preferences are heterogeneous, a straightforward solution is to increase the level of investment autonomy. Therefore, we investigate if beneficiaries are actually able to translate their preferences into financial decisions themselves. Currently the Dutch pension system works with defined benefits with very limited influence from beneficiaries.

In defined benefit (DB) pension systems, participants cannot directly interfere with the investment process. A setting in which the participants do have greater influence in their pension investments is in defined contribution plans (DC). On the one hand Lusardi and Mitchell (2007b) report a trend in countries shifting from defined benefit to defined contribution systems. On the other hand Benartzi & Thaler (2005) find that many defined contribution pension funds doubt the quality of investment strategies of their beneficiaries. Van Rooij et al. (2007) show that people are on average not able to make consistent choices in a risk-return tradeoff universe. This effect is even stronger for beneficiaries with limited financial knowledge.

In this respect, it is important to take financial literacy into account as more financially literate individuals are more involved with their financial decisions and make more sophisticated financial choices. They are more prone to plan for their retirement (Gustman and Steinmeier 2004, Van Els et al. 2004, Lusardi and Mitchell 2007ab, Van Rooij et al. 2011a), they hold more diversified portfolios (Calvet et al. 2009ab), have higher levels of savings (Bernheim et al. 2001, Bernheim and Garrett 2003), and they are more likely to participate in the stock market (Van Rooij et al. 2011b).

As we use a sample of Dutch households, we know from Van Rooij et al. (2011a,b) that the respondents do understand basic financial and economic concepts, though, when the financial

products become more complex there is very little knowledge at hand. Therefore, we expect that the average respondent will not be able to make financial choices consistent with their values. A consequence would be that giving respondents more freedom of choice is not the optimal way to implement their values in their pension investments. This reasoning is in line with our third and fourth hypotheses.

H3: Considerable segments of beneficiaries are not able to translate their values into sound financial decisions consistently.

H4: The beneficiaries with low levels of financial literacy are less capable of incorporating their values into their investment decisions.

3. Data

To test our hypotheses we use a unique dataset on Dutch households. The data are derived from a customized questionnaire, matched to a wide range of demographics from the CentERdata Databank at Tilburg University. Respondents are members of the CentERpanel⁷ who participate in weekly surveys over the internet using a computer. When a computer is not available, the members are provided with a television set up box which makes the sample selection exogenous from the availability of an internet connection. The members of the CentERpanel also participate in the DNB household survey that is run by CentERdata as well. This survey gathers information on the financial situation and investment choices of the households. The sample is updated semi-annually with new panel members to keep the sample representative of the Dutch population.

As mentioned earlier, the majority of the individuals are not financially sophisticated (e.g. Lusardi and Mitchell 2007, Van Rooij et al. 2011a,b). We ensured that the customized questionnaire is as simple as possible.

⁷ Our survey is sent out once so we cannot benefit from the panel structure of the data. We translate the questions used throughout this paper into English and present them in appendix A.

The Dutch pension system⁸ provides an ideal situation to investigate to what extent values drive financial decision making. Since the Dutch pension system up to date is a defined benefit (DB) culture the individuals do not have to take riskiness into account, only the final payments matter. We define a setting in which we ask respondents how much they value typically applied socially responsible investment screens. In the next step we ask the respondents if they are willing to give up a small part of their pension for the application of these screens. We state explicitly that it will cost them money, reflecting the direct costs of screening and the sacrificed return from reducing the investable universe (Hong & Kacperczyk 2009). Because we assume pension fund managers maximize returns within the boundaries of their mandates, screening can never lead to an increase in expected financial returns. This line of questioning provides us with a way to test if beneficiaries are willing to give up some of their wealth in order to (partially) align the pension investments with their values. Alternatively stated, we test the disutility from investments in undesirable financial products.

We focus on stated preferences towards social and environmental screening. Since we investigate a financial product we avoid the difficulties that a lot of studies into ethical products have regarding longer travel distance and availability of the products (e.g. Laroche et al. 2001, Becchetti and Rosati 2007).

The main theme of the questionnaire is sustainable behavior of households, and was sent to a representative sample of the Dutch society by CentERdata at the fourth of March 2011. The respondents were given until eight March 2011 to answer the questions. While the response rate concerning the entire survey was 63% (1843 out of 2878 members) we focus in this study on those household members of at least 20 years of age⁹ (1766 members). The average participant is a little over 55 years of age, the average household has a total household net income that is €2837 per month,

⁸ For an elaborate description of the Dutch pension system see Van Rooij et al. (2007).

⁹ We also repeat all our analyses on a sample of individuals who have at least 20 years of age and cannot be older than 65, which is the legal retirement age. As a result, this sample consists out of 926 participants. All reported results are robust to using this sample.

and 54% is male. We also obtain information on drinking and smoking behavior. 18% are smokers, and 27% never drink alcoholic beverages.

Furthermore, we asked the respondents to self assess their risk tolerance when it comes to decision making in the pension domain. In addition to self assessed risk tolerance we use another measure introduced by Barsky et al. (1997). This measure uses forced choices between gambles over a lifetime income to measure risk tolerance. The correlation between the two risk tolerance measures is only slightly above 20% therefore we follow Van Rooij et al. (2007) and use both measures as control variables in our analyses since they apparently measure different dimensions of risk tolerance.

Besides risk tolerance, the household members estimate their own level of financial sophistication. Around 6% of the respondents claim to be in the two highest categories of financial expertise. However, self assessed financial literacy might not be optimal so we match our original data to a questionnaire that covered financial literacy sent out by CentERdata in May 2011. We are able to match roughly 77% of all (1766) observations. The variables we use include the three basic questions on financial literacy originally designed by Lusardi & Mitchell (2008) expanded with two additional questions on mortgage rents and the relation between interest rates and bond prices¹⁰. Only 15.4% of the respondents were able to answer all financial literacy questions correctly.

4. Results

4.1 Measuring social responsibility; Exclusionary strategies

We use several approaches to measure the extent to which people value social responsibility in their pension investments. For the groundwork we use typically applied exclusionary strategies from socially responsible investment practices. The companies excluded operate in the so-called “sin” industries, i.e., alcohol, tobacco, and gambling. Companies operating in these industries are often excluded from the investment portfolios of large institutions that are subject to social norms in the US (Hong and Kacperczyk, 2009). The other exclusions are companies that (in)-directly violate human

¹⁰ For exact specification of the financial literacy questions see Appendix B.

rights or operate in the nuclear energy, weapons manufacturing¹¹, or pornography industries, since these issues have been increasingly receiving attention in the European institutional investment environment in recent years. This concept of excluding assets from the investable universe is referred to as exclusionary screening. We let the respondents rate the exclusionary screens on a seven point Likert scale from “very unimportant” to “very important”.

[Insert Table 1 around here]

From panel A in Table 1 we find, on average, respondents deem the exclusion of human rights offenders and the weapon industry as more important than other types of exclusionary screens. On average households seem to care the least about screening investments in the alcohol industry. Interestingly, the lowest ranked screens show the highest standard deviation, which means that respondents’ values tend to be more consistent for exclusionary screens which were more highly ranked on average. Applying these investment screens is one approach to capture the values of a larger part of society. However, before drawing inferences from these statistics we want to verify if the reported values make sense. We do this by comparing the stated preferences to the behavior of the respondents.

We expect smokers and drinkers to have different values towards the exclusion of the respective industries from their pension investments. Panel C of Table 1 displays the results of differences in mean values with the accompanying test statistics for the tobacco industry screen between smokers and non smokers. The difference is negative and highly statistically significant with a t-statistic of -7.44. It is also a natural step to compare how the alcohol exclusionary screen is valued by drinkers (people who consume at least one glass of alcohol a week) and non-drinkers. Again, the difference in importance is statistically significant with a t-statistic of -5.21 (see panel D of Table 1). More specifically, for drinkers we observe that the mean values people attribute to the alcohol industry exclusionary screen gradually decrease in the amount of alcoholic beverages consumed per week (see Table 1 panel E). We interpret this as evidence that peoples’ reported values correspond

¹¹ Not cluster bombs and nuclear weapons since they are already excluded by the Dutch pension funds.

with their day-to-day behavior. In addition we also report significant gender differences, women value all exclusion criteria significantly lower than do men (see panel B of Table 1). In sum, Table 1 shows that there is significant (between groups) variation in the stated preferences towards social screens in pension investments which confirms our first hypothesis.

4.2 Are pension investment decisions influenced by social investment preferences?

Our survey results show conclusive evidence of variation in the valuation of several social investment strategies. We now focus on financial decisions people make and specifically if those decisions change when offered a more socially responsible alternative. It is also important to check if the respondents are able to make financial decisions consistent with their values.

4.2.1. Positions in stocks vs. bonds

At the start of the survey the respondents fill out what part of their pension allowance they would like to invest in stocks given that currently the average pension fund invests 40% of the investment in stocks and 60% in bonds. For the sake of simplicity we refrained from considering other types of investments following Van Rooij et al. (2007). To overcome confusion about stocks and bonds we state that bonds are characterized as low risk, low expected return investments and stocks as high risk, high expected return investments¹².

In a next step we introduce a stock portfolio that has exactly the same characteristics as the current portfolio the pension fund holds for the participant. It offers the same payment and is exposed to the same amount of risk, but applies all the described exclusionary screens to the investment portfolio. We ask if they would like to invest more, the same, or less if the basket of stocks they are offered is socially screened.

In panel A of Table 2 we show that 17.5% of our respondents answer this question with “less”. This result suggests that if all respondents were rational agents, at least this 17.5% derive

¹² Van Rooij et al. (2011b) reports that around 40% of household members do not know the difference between the risk-return characteristics of stocks and bonds.

negative utility from excluding the controversial industries because the screens are applied with *ceteris paribus* conditions.¹³ Nevertheless, the sum of stated preferences towards the exclusionary screens for this group is *higher* than for the beneficiaries who want to invest an equal amount given the screened portfolio. Therefore, it is plausible that on average these beneficiaries experience problems in making financial decisions. In support of this suggestion, unreported tests show that this group has significantly lower financial expertise and a lower level of education than other respondents.

On average, people who want to invest more in stocks given the portfolio is screened have significantly stronger stated preferences towards the exclusionary screens (Table 2 panel A). Put differently, they assess higher values of importance to the exclusionary screens than all other respondents. In unreported analyses we verify that this group consists out of individuals who are more risk tolerant therefore they are more eager to shift their portfolio to more stockholdings.

The most important result from panel A in Table 2 is that almost all participants answer “the same amount of stocks” meaning that they are indifferent between their current holdings and the holdings of the screened portfolio. Another interpretation of this result is that they have such high levels of risk aversion that the gain in utility is not large enough for them to switch to a slightly riskier portfolio (more stock holdings).

Summarizing, these findings suggest that financial illiteracy is at work as a large group of the respondents report questionable financial choices given their stated preferences towards social screening. We can see this from the reluctance of respondents to change hypothetical stock holdings and from difference tests in stated screening preferences.

[Insert Table 2 around here]

4.2.2. *Preference between stock baskets*

¹³ *At least* 17.5% since risk aversion might withhold beneficiaries from switching their holdings.

Analyzing percentages invested in hypothetical stock portfolios seems not to be the optimal way to investigate the effects of values on financial decisions. Therefore we also included a more simple measure in which we ask the respondents directly for their preferences between stock baskets. A basket that is equal to the current portfolio of their pension fund and one that applies the exclusionary screens, holding all characteristics like risk and return equal. Almost 55% of the respondents prefer the screened basket of stocks given equal characteristics. In panel B of Table 2 we show that these respondents account a higher importance level to the sum of all exclusionary screens than all other participants on average.

Other respondents prefer their conventional portfolio or do not have a preference. The difference in importance levels between those two groups points into the opposite direction from what we would expect (the group that is indifferent reports lower values than the group that prefers the conventional portfolio). In an unreported test we verify that this difference is significant at the 1% level. Again these results hint towards an explanation in which a large part of the participants are not able to make these simplistic financial decisions. Besides that we take from this question that the majority of the respondents positively value social responsibility in their pension decisions as 55% prefer the screened portfolio.

4.2.3. Willingness to pay

We also measure if the values of the beneficiaries towards the screening criteria translate into a willingness to pay (henceforth WTP) for these values. Put differently, is the net gain in utility (if any) enough to lead to the participants accepting a lower pension income? In defined benefit pension plans the pension funds have the duty to invest the allowances for participants. This makes it possible to extract values from the answers the respondents give because they do not have to take riskiness into account. We explicitly explain to the respondents that only their monthly pension entitlements will vary.

The respondents rate their willingness to pay on a seven point Likert scale that ranges from “No, certainly not” to “Yes, certainly”. From these seven point scales we create two indicators of

WTP, WTP(a) and (b), with the outcomes “Yes”, “Neutral”, and “No”. For WTP(a) we assign “Neutral” if the value is 4, and “Yes” (“No”) if the value is higher (lower) than 4. For WTP(b) we are more conservative by assigning “Neutral” if the value is 3, 4, or 5. The results can be seen in panel C of Table 2. Beneficiaries who are willing to give up pension income have the highest stated preferences towards the proposed screens compared to the other groups. The differences between the beneficiaries who want to pay and the ones who do not are statistically significant with t-statistics higher than 10 for both the conventional WTP(a) and the more conservative WTP(b).

4.3 Results: Financial literacy and translating values into sound financial decisions¹⁴

From Section 4.2 it follows that the financial choices made do not always reflect the values of the participants. On the one hand this is to be expected since previous research reports low levels of financial literacy among household members (e.g. Van Rooij et al. 2011a,b). On the other hand we posed the questions in such a way that only very limited financial knowledge is needed to answer them. Therefore this section takes a deeper look into the relationship between consistent financial decision making and financial literacy.

A first glance at the answers already shows that it is difficult to explain the answers to the different questions using economic rationale. For instance, the significant variation in the self reported preference levels of the applied exclusionary screens between groups leads us to expect different investment preferences when these screens are applied. In contrast we see that the vast majority of individuals make the same hypothetical investment decision. Therefore, to relate the answers of the *percentage invested in stocks* question to the stated preferences towards the social screens, individuals should have an extreme aversion against investing in stock market for example due to risk aversion or distrust (e.g. Guiso et al. 2008).¹⁵ Another more plausible explanation is that beneficiaries are simply

¹⁴ All multivariate results reported in the remainder of this paper are robust to using category dummies instead of ordered variables for education, age, and income.

¹⁵ The disutility from investing in the stock market should be very high since the beneficiaries can change the stockholdings with 1% increments .

not able to translate their preferences into a utility maximizing financial choice when at the same time taking risk and return into account. Note that the other two financial choice measures (*preferred basket* and *WTP*) are not influenced by risk aversion.

To measure if the respondents make consistent financial choices we create four different dummy variables that measure if the financial choices of beneficiaries are consistent or not¹⁶. We define:

- ERROR1 to be 1 if the answers to the *percentage invested in stocks* and the *WTP(b)* question are not consistent (e.g. if the answers are: I want to invest less in stocks and yes, I am willing to pay for screening).¹⁷
- ERROR2 to be 1 if the answers to the *percentage invested in stocks* and the *preferred basket* question are not consistent (e.g. if the answers are: I want to invest less in stocks and I prefer the socially screened basket).
- ERROR3 to be 1 if the answers to the *WTP(b)* and the *preferred basket* question are not consistent (e.g. if the answers are: I have no preference between baskets and yes, I am willing to pay for screening).
- ERROR4 to be 1 if any of the three answers is not consistent with another.

This results in four variables that measure the consistency of financial decisions in different ways. The correlation is highest among the first and the second ERROR (0.58), and lowest between the second and the third ERROR (0.01). This implies that we are not measuring the same thing in three different ways. 11% of the respondents make the first ERROR, compared to 15%, 26% and 37% making the second, third and the fourth ERROR respectively. These results show that a considerable part of our sample is not able to consistently incorporate their values into their financial decisions in different situations, confirming our third hypothesis.

To measure if the financial choices are related to financial literacy we use the expanded literacy questions from Lusardi & Mitchell (2008). Using the answers to five questions we create two

¹⁶ See appendix D for the exact description of the how the ERROR variables are defined.

¹⁷ All our results are robust to using the less conservative WTP(a) to create the ERROR variables.

different literacy indexes. The first one is simply the sum of all correct answers to the five literacy questions. The second index is created using a principal component factoring analysis retaining only the components with an eigenvalue greater than one (the first two factors)¹⁸.

To test our hypothesis that less financially sophisticated individuals are less capable of incorporating their values into their financial decisions we estimate a probit model using the ERROR variables as dependent and the financial literacy variables as independent variables. In Table 3 we report marginal effects estimated at mean values. For all specifications reported in Table 3 we find negative coefficients on the financial literacy variables which are significant at the 5% level in three out of four specifications.¹⁹ These results strongly support our fourth hypothesis. The model specifications that include control variables have lower loadings on the literacy variables. This is not surprising as education is among the most important drivers of financial literacy (Van Rooij et al. 2011).

As expected, the coefficients on education load significantly negative indicating that on average people who enjoyed a higher level of education are less likely to make contradictory financial choices. Income has a negative effect while age has a strong positive effect on all four ERROR dummies (possibly picking up ability and experience in making financial decisions). In addition we find that being male and having a higher self assessed risk tolerance increases the likelihood of making the third and fourth ERROR.

[Insert Table 3 around here]

Summarizing, we have shown that over one third of the beneficiaries are not capable of incorporating their values into their financial decisions and that a lack of financial sophistication can

¹⁸ See appendix C for more information on the creation of the financial literacy variables.

¹⁹ Financial literacy is not significant in explaining an inconsistent choice between the willingness to pay and the preferred basket questions. It seems that financial illiteracy does a better job at explaining the ERRORS resulting from a combination with the more “complicated” question. Whereas education is significant in explaining all ERROR variables.

partially explain this. These findings have important consequences, if the fiduciaries want to take the preferences of beneficiaries into account they have to be very careful in designing a solution to both the problems of heterogeneous preferences *and* the low financial literacy of the households. In addition, governments who want to give their population more financial responsibility should also take great care to make sure that individuals are well prepared.

5. Additional analyses

In this section we provide additional evidence that Dutch pension beneficiaries positively value several socially responsible investment screens because this is the foundation of the presented analyses so far.

5.1. Measuring social responsibility; Best practices

Taking the same approach as for the exclusionary screens we ask the respondents to value certain best practices as selection criteria for stocks. We do not explain the details of the criteria as these are rather subjective, and difficult for respondents to interpret. We only provide the basic idea of the screening process explaining that the companies that are selected perform above average on that practice. This gives us the opportunity to refrain from the numerous possibilities to apply best practices screening. We argue that this is an issue on the implication of the screens which suits investors who are willing to use these types of investment screens to maximize returns while we investigate if individuals are driven by their values and not by profit motives.

[Insert Table 4 around here]

Table 4 panel A shows that from the possible best practices criteria, participants rate employee relations (e.g. pension, health and safety, schooling, anti-discrimination, and work atmosphere) as most important and with the lowest deviation in answers. On the other hand selecting firms based on their charity policy is rated least important. This is striking since the Dutch gave around €4.3 billion to charities in 2007 which is 0.8% of the GDP (Schuyt et al. 2009). This might

have several reasons. Some charities have suffered from bad press due to high salaries paid to their directors. Another reason can be that people prefer to choose themselves which charities to support.

For completeness we compare the average stated preferences towards these screens over different groups as we did in Table 1 (see panels B to D of Table 4). Most striking is that (again) women value all screening criteria significantly higher than do men, except for the profit screen. Therefore, female beneficiaries have a fixed positive effect towards *social and environmental* screening.

5.2. Are beneficiaries willing to pay?

In total we now have two sets of social investment screens and the stated preferences towards these screens. We continue by investigating if beneficiaries actually get positive utility from investing their pension endowments more responsibly. We do this by asking the respondents if they are willing to sacrifice pension income for the application of the screens that they valued higher than 4 out of 7. When no screen was ranked higher than 4 we select all criteria (this happens in 38% of all cases). We do this for both the exclusionary screens presented in Table 1 and the best practices screens presented in Table 4.

In two steps the respondents had to fill out if they would accept a monthly pension entitlement that is lower than their expected entitlement they receive with the current investment policy. Panel A of Table 5 shows that 25.72% (28.71%) does not want to give up anything or only a negligible part of their pension for the exclusionary (best practices) screens that they personally stated a preference towards excluding. Roughly 40% of the respondents agree to give up 5% of their pension income after retirement. Since it is well known that framing can influence the outcome of the results with these types of questions we refrain from interpreting these percentages directly²⁰. These numbers do inform us that we can confirm our second hypothesis that individuals want to sacrifice pension income to

²⁰ The percentages are chosen in consensus with the CentERdata staff. More realistic (lower) percentages would cause almost all participants to declare themselves willing to pay since they perceive it as a negligible amount.

align their investments with their social preferences since over 70% of our respondents wants to give up a considerable part of their pension income for such an alignment.

[Insert Table 5 around here]

5.3. Determinants of willingness to pay

To analyze willingness to pay we generate a dummy variable that takes on the value of 1 if the respondent is willing to give up pension income for (a partial) alignment of pension investments with his social and environmental preferences. First we verify that the beneficiaries who rate the socially responsible screens as more important are also more likely to be willing to pay for the implication of these screens (Table 5 panel B). The sum of importance levels for all exclusionary screens is significantly higher (t-statistic of 10.49) among the respondents who want to give up part of their pension income. Also the number of screens rated higher than 4 is significantly higher. In panel C of Table 5 we verify these results for the best practices screens. Moreover, the correlation between the dummy on willingness to pay for exclusionary screens and the dummy for best practices criteria is 85% implying that the respondents who do want to pay for screening want to do so for different types of social screening.

In Table 6 we make explicit for which type of person the surplus utility of screening is high enough to overcome any pecuniary motives. Therefore we use the WTP(p) dummy in a probit regression framework with the log of net monthly household income, gender, and some other controls used often in household finance studies (e.g. Van Rooij et al 2007, Van Rooij et al 2011ab, Renneboog and Spaenjers 2011). In addition we add a dummy that takes on the value of one if the respondent scores at least one screen higher than four out of seven (Dimportant). Finally, we add risk tolerance and financial expertise variables. The first two columns in Panel A of Table 6 show the marginal effects predicted at the mean value. Individuals who are more highly educated and individuals from higher income categories are significantly more likely to be willing to pay for personalized social screening. The most significant result is that individuals who have a positive stated preference towards at least one of the social screens are 40% less likely to sacrifice pension

income. These results are robust to excluding respondents who make inconsistent financial choices and in unreported analyses we show that excluding measures of financial expertise and risk tolerance or using different variables to measure preferences does not materially alter the results.

[Insert Table 6 around here]

The effects are almost identical for the best practices screens (see panel B in Table 6). Interestingly, drinker and male are both significant. The gender effect is in line with Andreoni and Vesterlund (2001) who find that females are more willing to engage in altruism than do men when altruism is expensive²¹. And with Laroche et al. (2001) who find that especially women have a higher willingness to pay for environmentally friendly products. Still, by far the most economically and statistically significant determinant is whether or not the beneficiary has a positive stated preference towards social screening. Therefore we test determinants of having this preference and report the results in Table 7.

The results from all columns in panel A of Table 7 show that female beneficiaries have stronger preferences towards social screening, they are around 4% more likely to score at least one of the screens higher than 4 out of 7. Another interesting result is that individuals with a higher level of education are more likely have a positive preference- and to appoint the maximum score of 7 out of 7 towards at least one exclusionary screen while at the same time education has no effect on the sum of all screen ratings. All else equal older people rate all screens higher on average. Furthermore, individuals who smoke and are more tolerant to risk are less likely to prefer social screening. Looking at panel B of Table 7 we see that the results are very much the same for the best practices screens. The difference is that education has lower predictive power while self declared financial literacy is now significant. Individuals with higher self reported financial literacy report a lower sum of preferences towards all social screens and have around 3% lower probability per increment to appoint a maximum score to a best practices screen. Across the board the pseudo-R2s and the marginal effects are low

²¹ We argue that the amounts of willingness to pay we demand from the individuals are definitely expensive.

meaning that if pension funds want to apply socially responsible investments they should reveal the preferences of beneficiaries by direct engagement.

[Insert Table 7 around here]

6. Discussion

A natural problem in the design of our survey lies in the fact that we do not observe the original pension investments of the pension funds and even if we would be able to get this information we are almost certain that the average individual does not possess this information. Therefore our results can also be interpreted as a lack of transparency of the pension funds' investments. Since beneficiaries who are willing to accept a lower pension for the application of these screens *consider* their pension fund holdings to be less socially responsible than what they would ideally like them to be. This does not necessarily mean that the holdings do in fact not meet the demands of the pension participants to a large degree.

We also asked the respondents if they missed certain screens in the survey. The screens most often mentioned were companies with an excessive bonus culture, companies that engage in animal testing or other business practices that violate animal wellbeing, and using the environmental dimension as an exclusionary screen (worst polluting) rather than a selection screening method. Therefore the percentage of people willing to pay for somewhat customized responsible pension investments might be even larger than reported here.

Less of a concern is the fact that the questions reflect simplified versions of reality which is done to partially overcome the low financial literacy of the average household member. A socially responsible investment strategy does not necessarily exclude all assets that do not pass a certain form of screening. Pension funds often interfere with managerial decisions by corporate engagement. These other types of SRI are ignored in this paper.²²

²² Though, our results are not influenced by this, since social engagement is also costly for beneficiaries (Barber, 2007).

7. Conclusion

This paper reports on frictions between pension fund participants' social values and the allocation of their pension assets. To our knowledge it is the first empirical study into the effects of social values on pension investment decisions. We provide consistent evidence that beneficiaries do value social responsibility in their pension investments. Companies that operate in the weapons industry and companies that violate human rights amendments are deemed most important to be excluded from the investment portfolios of Dutch beneficiaries in 2011 relative to our proposed screens. While excluding the "sin" industries (alcohol, tobacco, and gambling) is of a much lower importance to our respondents. It seems to be important for the respondents that companies treat other humans well as the highest rated exclusionary as well as best practices screens are related to human wellbeing.

We further investigated if respondents are able to translate these values into financial decisions and found that over one third reported at least one inconsistent financial choice. In particular, respondents who do not possess the required level of financial literacy to make investment choices and have a lower level of education, are not able to consistently match their stated social preferences with financial decisions. This is an important finding since the majority of beneficiaries care about social and environmental screening in their pension investments.

Summarizing we find that a significant tranche of pension participants do derive positive utility from social screens in their pension investments. If pension funds try to take into account the values of their clientele they either fail to communicate their social responsibility practices effectively or their social responsibility practices do not meet the needs of the participants. Because we observe variation in preferences it might not be optimal to provide the pension fund participants with just one pension investment scheme. Our findings have important implications on how socially responsible investment filters into the public domain through a market based system. It is important to reflect upon the influence of financial responsibility in society, whilst reconciling this with the observed level

of limited financial literacy, which may stand in the way of providing tailor-made pension investment schemes for all. We leave it to future research how to best tackle these issues.

Table 1 Importance of exclusionary screens

This table summarizes the self reported importance level of several exclusionary screens often applied in practice by (social) investment funds. The answers range from 1=very unimportant to 7=very important. Panel A contains basic summary statistics. Panel B until D compare the answers over different groups of respondents testing the uncontrolled mean differences based on gender, smoking, and drinking behavior. Panel reports on the importance of the alcohol exclusionary screen and drinking behavior. *, **, *** represent significance at the 10%, 5%, and 1% respectively.

Summary statistics for the Exclusionary screens						
Panel A						
Variable	Obs.	Mean	Std. Dev.	Min.	Max.	
Weapons	1766	5.58	1.93	1	7	
Alcohol	1766	4.11	1.90	1	7	
Tobacco	1766	4.54	1.94	1	7	
Gambling	1766	4.95	1.97	1	7	
Sexind	1766	5.10	2.02	1	7	
Nuclear_en	1766	4.52	2.12	1	7	
Human	1766	5.89	1.77	1	7	
Panel B						
Variable	Female (815 obs.)		Male (951 obs.)		Difference	Tests
	Mean	Std. Dev.	Mean	Std. Dev.		
Weapons	5.88	1.76	5.32	2.03	0.56 ***	6.14
Alcohol	4.44	1.86	3.83	1.89	0.62 ***	6.88
Tobacco	4.77	1.89	4.35	1.97	0.42 ***	4.57
Gambling	5.25	1.88	4.70	2.01	0.56 ***	5.98
Sexind	5.53	1.88	4.73	2.07	0.80 ***	8.50
Nuclear_en	5.08	1.97	4.04	2.12	1.04 ***	10.63
Human	6.08	1.66	5.74	1.85	0.34 ***	4.01
Panel C						
Variable	Smoker (316 obs.)		Non-smoker (1450 obs.)		Difference	Tests
	Mean	Std. Dev.	Mean	Std. Dev.		
Weapons	5.47	1.96	5.60	1.92	-0.14	-1.14
Alcohol	3.71	1.82	4.20	1.91	-0.48 ***	-4.13
Tobacco	3.82	1.77	4.70	1.95	-0.88 ***	-7.44
Gambling	4.75	1.97	5.00	1.97	-0.24 **	-1.98
Sexind	4.97	2.01	5.13	2.03	-0.16	-1.26
Nuclear_en	4.37	2.11	4.55	2.12	-0.18	-1.37
Human	5.82	1.77	5.91	1.77	-0.09	-0.86
Panel D						
Variable	Drinker (1285 obs.)		Non-drinker (481 obs.)		Difference	Tests
	Mean	Std. Dev.	Mean	Std. Dev.		
Weapons	5.62	1.90	5.48	2.01	0.14	1.35
Alcohol	3.97	1.86	4.49	1.95	-0.53 ***	-5.21
Tobacco	4.50	1.94	4.65	1.96	-0.15	-1.46
Gambling	4.97	1.95	4.90	2.03	0.07	0.73
Sexind	5.09	1.99	5.12	2.12	-0.04	-0.37

Nuclear_en	4.42	2.11	4.79	2.11	-0.37 ***	-3.30
Human	5.93	1.74	5.80	1.85	0.13	1.36

Panel E

Units of alcohol per week	Obs.	Percent	Mean	Std. Dev.	Min	Max
None	481	27%	4.49	1.95	1	7
1 to 5	705	40%	4.12	1.88	1	7
6 to 10	353	20%	3.94	1.86	1	7
11 to 20	189	11%	3.68	1.81	1	7
>20	38	2%	2.92	1.40	1	5

Table 2 Financial choices and screening valuation, three candidates.

This table summarizes the sums of self reported importance level of screens (often applied in practice by social investment funds) sorted by three financial choice variables. The answers range from 1=very unimportant to 7=very important per screen. Panel A compares the answers between the groups that want to invest less, the same, or more in stocks if the portfolio applies the exclusionary screens. Panel B does the same for portfolio preferences “screened”, “indifferent”, and “conventional”. Panel C reports the differences of the self reported important levels between the group willing to pay for screening and the group that is not as well as summary statistics on the willingness to pay variable. This is done using two different definitions of the WTP variable. In each panel we test difference between the outer categories and report the two tailed t-statistics. Standard deviations are reported in parentheses. *, **, *** represent significance at the 10%, 5%, and 1% respectively.

<i>Panel A: % of stock invested</i>					
	More	The same	Less	More-Less	Tests (t-stat)
Sum excl. screens	38.20	34.13	35.19	3.01 ***	2.62
Std. Dev.	9.26	10.69	12.57		
Observations	153	1304	309		
Percentage	8.66%	73.84%	17.50%		
<i>Panel B: Preferred portfolio</i>					
	Screened	Indifferent	Conventional	Screen.-Conv.	Tests (t-stat)
Sum excl. screens	36.91	30.47	33.91	3.00 ***	4.85
Std. Dev.	9.31	12.59	11.35		
Observations	964	451	351		
Percentage	54.59%	25.54%	19.88%		
<i>Panel C: Willingness to pay (WTP)</i>					
WTP(a)	Yes = 5-7	Neutral = 4	No = 1-3	Yes-No	Tests (t-stat)
Sum excl. screens	37.57	34.6	30.96	6.61 ***	11.49
Std. Dev.	9.13	9.68	12.60		
Observations	805	336	625		
Percentage	45.58%	19.03%	35.39%		
WTP(b)	Yes = 6-7	Neutral = 3-5	No = 1-2	Yes-No	Tests (t-stat)
Sum excl. screens	38.44	34.59	30.89	7.55 ***	10.38
Std. Dev.	8.94	9.70	13.36		
Observations	494	795	477		
Percentage	27.97%	45.02%	27.01%		

Table 3 Financial literacy and making consistent financial choices

This table presents marginal effects measured at mean values after a probit estimation on four different ERROR dummies that take on a value of one if the respondent makes a choice that is not consistent with the previously made financial choice. ERROR1 measures the consistency of answers between the “% of stock invested” and “WTP(b)”, ERROR2 between “% of stock invested” and “preferred portfolio”, ERROR3 between “WTP(b)”, and “preferred portfolio”, ERROR4 measures is only 0 for those who make consistent choices for all three variables. See appendix D for the exact specification of the ERROR measures. Panel A and B use the sum of the correct answers to the financial literacy questions as independent variables. Panel C and D include a factoring method explained in detail in Appendix C. In the first step of the two-step regression model the standard errors are clustered by household. We report the R-squared of the first stage. Z-statistics are in parentheses. *, **, *** represent significance at the 10%, 5%, and 1% respectively.

	ERROR1 11%	ERROR2 15%	ERROR3 26%	ERROR4 37%
<i>Panel A: Without controls</i>				
Finlitsum	-0.019** (-2.158)	-0.042*** (-4.110)	-0.008 (-0.621)	-0.048*** (-3.366)
1st stage pseudo-R2	0.005	0.015	0.000	0.007
Test Fin. Literacy=0	4.654	16.920	0.385	11.330
P-value	0.031	0.000	0.535	0.001
<i>Panel B: With controls</i>				
Finlitsum	-0.012 (-1.377)	-0.029*** (-2.702)	-0.008 (-0.598)	-0.037** (-2.389)
l_hhnetincome	0.003 (0.406)	-0.009 (-1.160)	-0.016* (-1.704)	-0.024** (-2.277)
Education	-0.015** (-2.548)	-0.019*** (-2.831)	-0.022** (-2.498)	-0.034*** (-3.577)
Age	0.002*** (3.153)	0.002** (2.351)	0.002* (1.878)	0.004*** (3.382)
Rural	0.005 (0.772)	0.006 (0.742)	0.010 (1.033)	0.008 (0.751)
Hhsize	-0.014 (-1.535)	0.005 (0.460)	0.012 (0.987)	0.009 (0.704)
Male	0.008 (0.459)	0.002 (0.083)	0.059** (2.388)	0.065** (2.353)
Dsmoker	-0.011 (-0.513)	-0.025 (-1.002)	-0.003 (-0.086)	-0.014 (-0.370)
Drinker	-0.002 (-0.218)	-0.006 (-0.603)	0.013 (1.101)	-0.005 (-0.381)
Finexpert_self	-0.003 (-0.565)	-0.011 (-1.608)	0.003 (0.355)	-0.005 (-0.544)
Risktol_Barsky	0.001 (0.160)	0.004 (0.573)	0.005 (0.530)	0.006 (0.558)
Risktol_self	0.007 (0.994)	0.006 (0.694)	0.030*** (2.904)	0.028** (2.412)
l_time	0.010 (0.840)	0.011 (0.856)	0.009 (0.513)	0.016 (0.787)
1st stage pseudo-R2	0.047	0.044	0.026	0.038
Test Fin. Literacy=0	1.903	7.360	0.358	5.703
P-value	0.168	0.007	0.550	0.017

	ERROR1	ERROR2	ERROR3	ERROR4
<i>Panel C: Factor variables without other controls</i>				
Factor1	-0.013* (-1.705)	-0.019** (-2.137)	-0.011 (-0.957)	-0.033** (-2.454)
Factor2	-0.011 (-1.279)	-0.035*** (-3.501)	-0.001 (-0.077)	-0.032** (-2.399)
1st stage pseudo-R2	0.005	0.015	0.001	0.007
Test Fin. Literacy=0	4.727	16.790	0.920	11.750
P-value	0.094	0.000	0.631	0.003
<i>Panel D: Factor variables with other controls</i>				
Factor1	-0.007 (-0.885)	-0.009 (-0.996)	-0.004 (-0.309)	-0.017 (-1.244)
Factor2	-0.008 (-1.018)	-0.028*** (-2.750)	-0.006 (-0.496)	-0.031** (-2.197)
l_hhnetincome	0.003 (0.404)	-0.009 (-1.134)	-0.016* (-1.702)	-0.024** (-2.275)
Education	-0.015** (-2.540)	-0.020*** (-2.969)	-0.022** (-2.499)	-0.035*** (-3.613)
Age	0.002*** (3.152)	0.002*** (2.398)	0.002* (1.876)	0.004*** (3.391)
Rural	0.005 (0.753)	0.005 (0.650)	0.010 (1.020)	0.008 (0.706)
Hhsize	-0.014 (-1.537)	0.005 (0.482)	0.012 (0.986)	0.009 (0.704)
Male	0.008 (0.458)	0.004 (0.192)	0.060** (2.385)	0.067** (2.390)
Dsmoker	-0.011 (-0.512)	-0.025 (-1.011)	-0.003 (-0.084)	-0.014 (-0.373)
Drinker	-0.002 (-0.219)	-0.006 (-0.631)	0.013 (1.099)	-0.005 (-0.382)
Finexpert_self	-0.004 (-0.596)	-0.012* (-1.654)	0.003 (0.342)	-0.006 (-0.587)
Risktol_Barsky	0.001 (0.167)	0.005 (0.669)	0.005 (0.535)	0.006 (0.592)
Risktol_self	0.007 (0.991)	0.006 (0.698)	0.030*** (2.908)	0.028** (2.414)
l_time	0.010 (0.840)	0.010 (0.773)	0.009 (0.504)	0.016 (0.758)
1st stage pseudo-R2	0.046	0.045	0.026	0.038
Test Fin. Literacy=0	1.781	8.281	0.330	6.097
P-value	0.410	0.016	0.848	0.047

Observations 1368 (1363 with controls)

Table 4 Importance of best practices screens

This table summarizes the self reported importance level of several best practices screens often applied in practice by (social) investment funds. The answers range from 1=very unimportant to 7=very important. Panel A contains basic summary statistics. Panel B until D compare the answers over different groups of respondents testing the uncontrolled mean differences based on gender, smoking, and drinking behavior. *, **, *** represent significance at the 10%, 5%, and 1% respectively.

Summary statistics for the Positive screens						
Panel A						
Variable	Obs.	Mean	Std. Dev.	Min.	Max.	
Recycling	1766	5.53	1.43	1	7	
CO2	1766	5.44	1.49	1	7	
Employees	1766	5.76	1.37	1	7	
Community	1766	5.33	1.46	1	7	
Charity	1766	4.82	1.62	1	7	
Profit	1766	5.15	1.44	1	7	
Panel B						
Variable	Female (815 obs.)		Male (951 obs.)		Difference	Tests
	Mean	Std. Dev.	Mean	Std. Dev.		
Recycling	5.66	1.37	5.43	1.48	0.22 ***	3.29
CO2	5.63	1.41	5.28	1.54	0.35 ***	4.99
Employees	5.94	1.28	5.61	1.42	0.33 ***	5.11
Community	5.47	1.41	5.20	1.49	0.27 ***	3.93
Charity	4.99	1.56	4.67	1.67	0.32 ***	4.14
Profit	5.21	1.42	5.11	1.45	0.10	1.44
Panel C						
Variable	Smoker (316 obs.)		Non-smoker (1450 obs.)		Difference	Tests
	Mean	Std. Dev.	Mean	Std. Dev.		
Recycling	5.30	1.48	5.59	1.42	-0.29 ***	-3.25
CO2	5.26	1.51	5.48	1.48	-0.22 **	-2.38
Employees	5.62	1.43	5.79	1.35	-0.17 **	-2.02
Community	5.15	1.56	5.37	1.43	-0.21 **	-2.35
Charity	4.65	1.72	4.85	1.60	-0.20 **	-2.02
Profit	5.12	1.49	5.16	1.43	-0.05	-0.52
Panel D						
Variable	Drinker (1285 obs.)		Non-drinker (481 obs.)		Difference	Tests
	Mean	Std. Dev.	Mean	Std. Dev.		
Recycling	5.58	1.40	5.41	1.53	0.16 **	2.15
CO2	5.45	1.49	5.41	1.49	0.04	0.50
Employees	5.75	1.36	5.79	1.39	-0.04	-0.54
Community	5.30	1.45	5.39	1.47	-0.09	-1.14
Charity	4.79	1.62	4.89	1.65	-0.10	-1.19
Profit	5.18	1.43	5.10	1.48	0.08	0.98

Table 5 Willingness to pay for personalized social pension investments

This table reports the willingness to pay for personalized social pension investment screening. We personalize the investments by selecting only those screens valued higher than four on a seven point Likert scale. If none of the screens is valued higher than four we select all screens. Panel A reports the fractions of the sample and the accompanying answers. Panel B and C report the average sum of values sorted by willingness to pay and the number of screens valued higher than 4. The differences and two tailed t-statistics are reported in the most right columns. *, **, *** represent significance at the 10%, 5%, and 1% respectively.

Panel A: WTP(p) variable

WTP	Exclusionary screens		Best practices screens		WTP(p)
	Obs.	Percent	Obs.	Percent	
<1%	456	25.72%	509	28.71%	No
1%	84	4.74%	113	6.37%	Yes
2%	446	25.16%	460	25.94%	Yes
≥ 5%	787	44.39%	691	38.97%	Yes

Panel B: Assessed values and WTP(p) for Exclusionary screens

WTP(p)	Yes (1317 obs.)		No (456 obs.)		Difference	Tests (t-stat)
	Mean	Std. Dev.	Mean	Std. Dev.		
Sum excl. screens	36.26	(9.60)	30.18	(13.25)	6.08 ***	10.49
#screens >4	4.69	(2.18)	3.11	(2.80)	1.58 ***	10.80

Panel C: Assessed values and WTP(p) for Best practices screens

WTP(p)	Yes (1264 obs.)		No (509 obs.)		Difference	Tests (t-stat)
	Mean	Std. Dev.	Mean	Std. Dev.		
Sum B.P. screens	33.08	(6.14)	29.42	(8.63)	3.66 ***	10.04
#screens >4	4.84	(1.54)	3.70	(2.36)	1.14 ***	10.45

Table 6 Determinants of WTP for personalized pension investments

This table reports the marginal effects estimated at mean values after estimating probit models. The dependent variable is a dummy that is 1 for individuals who are willing to pay for socially screened pension investment portfolios. The individuals are offered a customized choice that selects only those screens rated >4 out of 7. Panel A presents the results for exclusionary screens on the full sample (columns 1 and 2) and a subset which excludes all respondents who make an inconsistent choice (columns 3 and 4). In panel B we do the same for the best practices screens. In addition columns 5 and 6 exclude respondents who only value the “profit” screen higher than 4 out of 7. In the first step of the two-step regression model the standard errors are clustered by household. We report the R-squared of the first stage. Z-statistics are in parentheses. *, **, *** represent significance at the 10%, 5%, and 1% respectively.

	<i>Exclusionary screens</i>				<i>Best practices screens</i>					
	Full sample		Conditional ERROR4=0		Full sample		Conditional ERROR4=0		Excl. only profit>4	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Dimportant	0.401*** (11.249)	0.395*** (9.402)	0.455*** (9.382)	0.454*** (7.924)	0.437*** (11.422)	0.422*** (9.279)	0.496*** (10.138)	0.459*** (7.677)	0.444*** (10.806)	0.443*** (9.075)
l_hhnetincome	0.022* (1.657)	0.017 (1.091)	0.039** (2.453)	0.039** (2.242)	0.044*** (3.131)	0.035** (2.195)	0.040** (2.461)	0.042** (2.277)	0.042*** (2.971)	0.033** (2.031)
Education	0.028*** (3.528)	0.021** (2.381)	0.035*** (3.597)	0.026** (2.360)	0.033*** (4.037)	0.030*** (3.216)	0.045*** (4.355)	0.043*** (3.762)	0.032*** (3.968)	0.029*** (3.113)
Age	0.001 (1.465)	0.001 (0.855)	0.001 (1.121)	-0.000 (-0.235)	0.001 (0.773)	0.001 (0.507)	0.000 (0.224)	-0.001 (-0.449)	0.001 (0.716)	0.001 (0.530)
Rural	0.000 (0.025)	0.003 (0.264)	-0.001 (-0.126)	-0.002 (-0.197)	0.003 (0.357)	0.004 (0.372)	-0.006 (-0.525)	-0.007 (-0.605)	0.005 (0.580)	0.006 (0.613)
Hhsize	0.006 (0.567)	-0.001 (-0.094)	0.007 (0.505)	0.002 (0.155)	-0.000 (-0.039)	-0.006 (-0.466)	0.009 (0.604)	0.002 (0.119)	-0.001 (-0.045)	-0.005 (-0.406)
Male	-0.032 (-1.493)	-0.050** (-2.037)	-0.036 (-1.336)	-0.048 (-1.562)	-0.062*** (-2.684)	-0.077*** (-3.016)	-0.060** (-2.080)	-0.085*** (-2.625)	-0.061*** (-2.628)	-0.078*** (-3.045)
Dsmoker	-0.065** (-2.214)	-0.056 (-1.628)	-0.022 (-0.606)	-0.029 (-0.703)	-0.050 (-1.636)	-0.055 (-1.533)	-0.021 (-0.559)	-0.043 (-0.986)	-0.050 (-1.640)	-0.054 (-1.495)
Drinker	0.019 (1.590)	0.019 (1.436)	0.026* (1.847)	0.030* (1.955)	0.023* (1.881)	0.019 (1.419)	0.037*** (2.582)	0.037** (2.329)	0.023* (1.950)	0.020 (1.526)
Finexpert_self	0.001 (0.101)	-0.008 (-0.869)	0.003 (0.292)	-0.015 (-1.369)	0.005 (0.638)	-0.005 (-0.485)	0.006 (0.561)	-0.008 (-0.699)	0.006 (0.671)	-0.004 (-0.446)
Risktol_Barsky	0.024*** (2.887)	0.025*** (2.618)	0.025** (2.343)	0.033*** (2.606)	0.024*** (2.659)	0.020** (2.060)	0.018 (1.547)	0.018 (1.392)	0.024*** (2.721)	0.020** (2.071)
Risktol_self	0.004 (0.439)	0.002 (0.184)	-0.001 (-0.106)	-0.003 (-0.194)	0.008 (0.738)	0.009 (0.756)	0.007 (0.532)	0.009 (0.606)	0.007 (0.705)	0.008 (0.709)
Finlitsum		0.065*** (4.494)		0.084*** (4.490)		0.059*** (3.749)		0.065*** (3.373)		0.059*** (3.734)
Observations	1,764	1,368	1,098	858	1,764	1,368	1,098	858	1,736	1,347
1st stage pseudo-R2	0.107	0.124	0.135	0.175	0.105	0.109	0.137	0.145	0.101	0.109

Table 7 Determinants of preference variables for environmental and social screens

This table reports the marginal effects after estimating probit models for columns (a)-(b) and first stage regression coefficients from ordered probit models are shown in columns (e)-(j). The dependent variables used are a dummy for individuals who are willing to pay for socially screened pension investment portfolios (a) and (b), a dummy for individuals that scored at least one screen 7 out of 7 (c) and (d), the sum of the scores for the social screens (e) and (f), quintiles of Total score (g) and (h), and the sum of all exclusionary screens valued higher than 4 out of 7. In panel A we report on the analyses using exclusionary screens, in panel B we report on all the best practices screens except the profit screen. In the first step of the two-step regression model the standard errors are clustered by household. We report the pseudo R-squared of the first stage. Z-statistics are in parentheses. *, **, *** represent significance at the 10%, 5%, and 1% respectively.

Panel A: Exclusionary screens

	Dimportant		1 screen max. score		Total score		Quintiles of total score		Sum of preferred screens	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
l_hhnetincome	0.021** (2.163)	0.013 (1.200)	0.022 (1.529)	0.018 (1.168)	0.032 (0.964)	0.020 (0.552)	0.014 (0.432)	0.003 (0.086)	0.035 (1.046)	0.017 (0.452)
Education	0.017*** (3.097)	0.019*** (2.942)	0.031*** (3.753)	0.033*** (3.540)	0.010 (0.530)	0.031 (1.511)	0.011 (0.584)	0.033 (1.555)	0.031* (1.689)	0.050** (2.443)
Age	-0.000 (-0.072)	-0.000 (-0.489)	0.000 (0.251)	-0.000 (-0.206)	0.008*** (3.579)	0.008*** (3.145)	0.010*** (4.368)	0.010*** (3.753)	0.008*** (3.515)	0.007*** (2.732)
Rural	-0.007 (-1.036)	-0.001 (-0.131)	-0.006 (-0.613)	0.010 (0.921)	0.002 (0.101)	0.013 (0.601)	0.003 (0.150)	0.013 (0.556)	-0.001 (-0.063)	0.009 (0.369)
Hhsize	-0.009 (-1.105)	-0.010 (-1.070)	-0.012 (-1.032)	-0.015 (-1.173)	0.020 (0.815)	0.015 (0.545)	0.026 (0.991)	0.018 (0.604)	0.008 (0.294)	-0.000 (-0.001)
Male	-0.047*** (-2.812)	-0.038** (-2.101)	-0.090*** (-3.914)	-0.062** (-2.406)	-0.417*** (-7.732)	-0.355*** (-6.041)	-0.446*** (-8.097)	-0.366*** (-6.014)	-0.400*** (-7.230)	-0.351*** (-5.742)
Dsmoker	-0.035 (-1.495)	-0.060** (-2.146)	-0.027 (-0.882)	-0.062* (-1.750)	-0.196*** (-3.225)	-0.277*** (-4.074)	-0.219*** (-3.352)	-0.302*** (-4.116)	-0.241*** (-3.578)	-0.342*** (-4.460)
Drinker	0.023*** (2.797)	0.023** (2.477)	0.020* (1.698)	0.021 (1.559)	-0.030 (-1.176)	-0.019 (-0.707)	-0.039 (-1.457)	-0.030 (-1.031)	-0.014 (-0.563)	-0.017 (-0.610)
Finexpert_self	0.002 (0.382)	-0.005 (-0.779)	-0.013 (-1.587)	-0.025*** (-2.809)	-0.039** (-2.193)	-0.047** (-2.398)	-0.040** (-2.212)	-0.052** (-2.537)	-0.018 (-0.987)	-0.029 (-1.430)
Risktol_Barsky	0.001 (0.103)	-0.006 (-0.870)	0.004 (0.506)	0.002 (0.158)	-0.017 (-0.880)	-0.029 (-1.320)	-0.019 (-0.956)	-0.028 (-1.234)	-0.012 (-0.561)	-0.032 (-1.343)
Risktol_self	-0.008 (-1.182)	-0.007 (-0.865)	-0.040*** (-4.099)	-0.035*** (-3.205)	-0.046** (-2.100)	-0.042* (-1.685)	-0.057** (-2.547)	-0.047* (-1.808)	-0.049** (-2.228)	-0.043* (-1.723)

Finlitsum		0.014 (1.311)		0.011 (0.726)		-0.082** (-2.293)		-0.095*** (-2.712)		-0.032 (-0.841)
Observations	1,764	1,368	1,764	1,368	1,764	1,368	1,764	1,368	1,764	1,368
1st stage pseudo-R2	0.034	0.038	0.033	0.034	0.011	0.012	0.028	0.029	0.016	0.018

Panel B: Best practices screens

	Dimportant		1 screen max. score		Total score		Quintiles of total score		Sum of preferred screens	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
l_hhnetincome	0.008 (0.859)	0.007 (0.684)	0.010 (0.649)	-0.003 (-0.170)	0.011 (0.337)	-0.004 (-0.118)	0.012 (0.371)	-0.008 (-0.202)	0.012 (0.324)	-0.000 (-0.008)
Education	0.010* (1.836)	0.007 (1.285)	0.002 (0.201)	0.004 (0.370)	-0.010 (-0.564)	-0.013 (-0.653)	-0.020 (-1.089)	-0.027 (-1.279)	-0.010 (-0.501)	-0.017 (-0.744)
Age	0.002*** (2.578)	0.001 (1.371)	0.007*** (6.804)	0.007*** (5.136)	0.020*** (8.511)	0.018*** (6.663)	0.021*** (8.563)	0.019*** (6.738)	0.017*** (6.749)	0.016*** (5.279)
Rural	-0.012** (-1.978)	-0.007 (-1.043)	-0.020* (-1.885)	-0.018 (-1.543)	-0.031 (-1.489)	-0.031 (-1.376)	-0.027 (-1.235)	-0.029 (-1.172)	-0.027 (-1.145)	-0.025 (-0.970)
Hhsize	-0.007 (-1.009)	-0.013* (-1.778)	-0.012 (-0.960)	-0.019 (-1.356)	0.006 (0.227)	-0.013 (-0.424)	-0.004 (-0.149)	-0.020 (-0.610)	-0.027 (-0.971)	-0.053 (-1.596)
Male	-0.041*** (-2.777)	-0.036** (-2.260)	-0.080*** (-3.121)	-0.068** (-2.310)	-0.266*** (-5.101)	-0.207*** (-3.526)	-0.263*** (-4.877)	-0.193*** (-3.162)	-0.259*** (-4.520)	-0.208*** (-3.198)
Dsmoker	-0.049** (-2.205)	-0.044* (-1.805)	-0.016 (-0.499)	-0.040 (-1.057)	-0.131** (-2.007)	-0.151* (-1.930)	-0.140** (-2.035)	-0.166** (-2.016)	-0.141* (-1.890)	-0.144* (-1.647)
Drinker	0.009 (1.076)	0.007 (0.853)	-0.023* (-1.785)	-0.028* (-1.916)	0.000 (0.002)	-0.006 (-0.183)	-0.002 (-0.064)	-0.002 (-0.072)	0.020 (0.682)	0.026 (0.778)
Finexpert_self	-0.010* (-1.918)	-0.017*** (-3.095)	-0.024*** (-2.673)	-0.034*** (-3.404)	-0.055*** (-2.974)	-0.066*** (-3.184)	-0.053*** (-2.773)	-0.065*** (-3.005)	-0.036* (-1.789)	-0.050** (-2.229)
Risktol_Barsky	0.002 (0.378)	-0.003 (-0.425)	0.021** (2.290)	0.020** (1.962)	0.011 (0.544)	-0.003 (-0.119)	0.008 (0.414)	-0.003 (-0.139)	0.003 (0.142)	-0.014 (-0.579)
Risktol_self	-0.008 (-1.261)	-0.006 (-0.921)	-0.051*** (-4.549)	-0.048*** (-3.771)	-0.075*** (-3.421)	-0.071*** (-2.845)	-0.074*** (-3.196)	-0.072*** (-2.721)	-0.046* (-1.921)	-0.039 (-1.390)
Finlitsum		0.015 (1.612)		-0.008 (-0.501)		-0.046 (-1.388)		-0.042 (-1.212)		-0.010 (-0.250)
Observations	1,764	1,368	1,764	1,368	1,764	1,368	1,764	1,368	1,764	1,368
1st stage pseudo-R2	0.043	0.052	0.065	0.066	0.021	0.020	0.038	0.038	0.027	0.028