Financial Literacy in the Age of Green Investment

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Abstract

We survey a large sample of Swedish households and connect the responses to administrative data to relate pro-environmental attitudes and values to actual investment decisions. Pro-environment households are not more likely to hold pro-environment portfolios. This results from financial disengagement: they are less likely to own stocks, check pension balances, or make green active retirement planning choices. Green financial engagement is stronger in settings where financial literacy is higher or where informational hurdles are lower. Informational barriers appear to prevent financial market prices and returns from fully reflecting household environmental preferences.

1 Introduction

In the fifty years since Milton Friedman's famous adage, "The business of business is profits" (Friedman, 1970), there has been an enormous growth in corporate social responsibility and socially responsible investing. Not only do firms tout corporate social responsibility when articulating their corporate strategy to outside stakeholders, financial market participants place growing importance on ESG considerations. Ultimately, these trends raise questions about the nature of underlying household demand for socially responsible behavior from firms and other financial market participants.

To better understand the impact of ESG preferences on capital market outcomes and firm behavior, a number of recent theoretical papers have taken up the connection between pro-social shareholder preferences and corporate behavior or asset prices. Pedersen, Fitzgibbons, and Pomorski (2020) derive a version of the CAPM in a setting in which some investors are environmentally unaware, some are aware of the potential cash flow implications of environmental issues but do not care about the environment, while some derive utility from holding stocks with higher ESG scores. In their model these three types of investors interact to determine asset prices. Pastor, Stambaugh, and Taylor (2020) develop a framework in which some investors harbor social preferences and derive positive utility from holding green stocks, thus affecting returns through their willingness to pay higher prices for green stocks. These models share a common assumption, which is that investors express their pro-social preferences through their portfolio choice decisions.

In this paper we empirically test this basic premise. Focusing specifically on environmental considerations (the E in ESG), we ask a simple question: do green households make green financial decisions? Exploring this question requires both an apparatus for measuring ESG-related preferences as well as data on actual financial decisions. We develop both.

Inspired by the Big-5 financial literacy test pioneered by Lusardi and Mitchell (2007), we develop a five-question test of environmental literacy that measures knowledge of basic facts related to climate change. We include this test in a larger survey that contains standard measures of financial literacy as well as beliefs about the financial tradeoffs associated with green investment and environmental values. These questions are designed to identify empirically the types of agents inhabiting the models of Pastor, Stambaugh,

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and Taylor (2020) and Pedersen, Fitzgibbons, and Pomorski (2020); in particular, our survey questions allow us to proxy for ESG-*aware* investors (those who think environmental considerations will have cash-flow implications for certain types of firms) and distinguish them from ESG-*motivated* investors (those who derive utility from holding ESG-tilted portfolios). Then we administer the survey to a large cross-section of Swedish households, where we can link the survey responses to administrative data that include detailed socio-demographics, stock ownership, and retirement savings decisions in a mandatory-participation, national pension plan.

Our central finding is that households with stronger pro-environmental values do not hold greener portfolios. A key reason for this is that households with pro-environmental views are disengaged from financial decisions. Individuals who place a high priority on environmental considerations are around 10% less likely than others to hold stock directly, controlling for demographics. The magnitude of this effect is comparable to that associated with not attending post-secondary education. Not only are they less likely to be direct stock owners, but even in a mandatory-participation retirement plan they show limited signs of engagement: they are more than 20% more likely to never check their pension balances, and they are more likely than others to leave their pension savings in the default fund choice rather than make an active choice. At the same time, they score high on measures of everyday pro-environmental behaviors—they recycle more than their neighbors, and they are willing to pay more for green products. For most individuals, however, this environmental engagement simply does not to cross over into the realm of financial engagement. They report that environmental issues are interesting but financial issues are boring.

These findings are striking in part because average levels of both environmental and financial engagement in Sweden are high by international standards. The fact that environmentally engaged households are financially disengaged presents a challenge to the idea of "people's capitalism"—the idea that ordinary citizens buy shares in firms and hold these firms to account, implicit in many models of corporate social responsibility. Understanding the reasons behind this disengagement are important for policymakers. Because pro-environmental views are so often associated with the political left, which is often critical of financial institutions, corporations, and capitalism in general (Kaustia and

Torstila (2012)), this could represent a form of virtue-signaling. Or it could simply reflect the complexity of making financial decisions.

While there could easily be a virtue-signaling component to our findings, we find that the complexity of many financial decisions presents a hurdle for many environmentally engaged individuals. For example, the Swedish Pension Authority uses a classification system that labels certain funds as ESG-compliant; this indicator was available in printed and on-line reference material. At the same time, some funds actually contain words in their name that signal their ESG status.[1] Using this variation in the difficulty of determining whether a fund is environmentally friendly, we find that only more financially literate individuals with pro-environmental preferences hold system-labeled ESG funds. Among lower literacy individuals, environmentally engaged respondents are much more likely to allocate their portfolios towards funds with green-sounding names. Even if this reflects a lack of trust in the government's labeling system, this finding suggests that informational hurdles create investment challenges that prevent preferences from being expressed in portfolio choices. An implication of this finding is that greater transparency and ESG-related information could allow households to better express their pro-environmental values through their investment decisions.

These results speak to several distinct literatures in household finance, behavioral finance and asset pricing. First, our results augment a large body of work in financial literacy demonstrating its connection to financial engagement—we expand this connection to include environmental matters.[2] Bauer and Smeets (2015), Riedl and Smeets (2017) and Brière and Ramelli (2020) offer evidence for increased sustainable investments among those with green-oriented values, but our results illustrate the importance of financial literacy and engagement for the expression of these beliefs. In that regard, our findings also relate to those in Giglio et al (2020), who exclusively survey high net worth individuals, and find that beliefs about discount rates and expected returns are reflected in the investment decisions people make. In contrast, our sample is based on a nationally representative cross-section of households, which is why we find limited evidence that environmental beliefs carry over to actual investment decisions.

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[1]Specifically, if the fund name contains the Swedish-language or English-language words for SRI, ESG, water, sustainable, environmental, ethical, earth, clean or green.

[2]See, for example, Ameriks, Caplin, and Leahy (2003), Beverly, Higert and Hogarth (2003), Anderson, Baker, and Robinson (2017), Lusardi and Mitchell (2014) and Van Rooij, Lusardi, and Alessie (2011).

The remainder of the paper proceeds as follows. First, in Section 2, we discuss our data in greater detail and develop our main measures of financial and environmental literacy, pro environmental beliefs and values as well as stockholdings and pension decisions. Then we move directly to our main finding by examining the link between environmental values and pension holdings. This appears in Section 3. In Section 4 we examine direct stock holdings. To dig deeper into the mechanisms behind the lack of green financial engagement, in Section 5 we relate our measures to a number of non-financial decisions and attitudes with clear implications for green behavior. Section 6 concludes with a discussion of the implications of these findings for policy and future research.

2 Empirical Design

The centerpiece of our empirical strategy is a survey that we developed containing three basic types of questions: questions about household values towards environmental issues, questions about pro-environmental and investment behaviour, and questions about financial and environmental literacy. In cooperation with Statistics Sweden, the government statistical agency, we invited a random sample of 20,000 Swedish households to take this survey online. The first survey was sent out on February 7, 2018, and after two reminders sent out on February 22 and March 5, the survey was closed on April 5, 2018. A total of 4,257 respondents completed the survey, for a response rate of just over 21%. After deleting incomplete survey responses and matching the data to the characteristics leaves us with at total of 3,993 observations.[3] Table I provides a demographic breakdown of the respondents along with mean values of the key variables of interest by demographic category.

<div align="center">Table I here</div>

The demographics include registry data obtained from Statistics Sweden for gender, age, income, education and location. Location makes it possible for us to control for population density in each of the 290 municipalities in Sweden where each respondent lives. Our urban/rural indicator variable assigns urban status to locations with population over

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[3]Details of the sampling procedure are presented in Appendix A.

100,000 and with a density over 100 people per square kilometer, which corresponds to the twelve largest cities in Sweden. We match the vote count from the 2014 election for the Swedish Green Party (*Miljöpartiet*), which has been part of the left wing coalition in Sweden since 2014, at the voting-precinct level to obtain a measure of the degree to which one's neighbors are likely to hold pro-environmental attitudes. This allows us to gauge the validity of some of our measures of pro-environmental attitudes and behaviours, and also allows us to account for peer effects that may shape attitudes toward the environment.

Through Statistics Sweden we can also compare our survey data to the overall Swedish working-age population.[4] We have an over-representation of women and of older, wealthier, higher-educated respondents in our sample: 57% of our respondents are 45 or older, while only 41% of the Swedish working age population is in this age range. We received 15% of the responses from the lowest income bracket, while 25% of the relevant population belong to this group. Slightly more than half of our survey respondents went to a university programme, while just under 40% of the Swedish population has completed high school.

2.1   Environmental values, beliefs and behaviours

One of our goals is to empirically distinguish respondents who harbor pro-environmental views, and therefore may hold ESG-tilted portfolios for utility-driven reasons, from respondents who may hold ESG-tilted portfolios for purely pecuniary reasons. This distinction corresponds to that made by Pedersen et al (2020) between ESG-aware and ESG-motivated investors. Towards this end, a key variable in our analysis is our measure of environmental value orientation. Schwartz (1982) defines a value as: "a desirable trans-situational goal varying in importance, which serves as a guiding principle in the life of a person or other social entity." Values therefore reflect a belief concerning the desirability of a certain end-state; they serve as a guiding principle for selecting or evaluating behaviour, people and events; they can be ordered in a system of priorities. To capture the degree to which an individual's personal values are oriented towards the environment,

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[4]Statistics Sweden provides sampling weights are based on gender, age, income, education and immigration background. All our results are similar with or without using weights, therefore in the tables presented here we do not include them.

we ask the following question intended to capture their willingness to accept financial tradeoffs for better environmental conditions:

- *Clean planet.* "A clean planet is more important to me than financial welfare." (25%)

Possible answers are presented on a five point scale from "Strongly agree" to "Strongly disagree", "Don't know" and "Prefer not to say". Twenty-five percent of respondents strongly agree to this statement, 39% agree and only about 8% disagree to some extent.[5] We code a dummy equal to one for those who strongly agree to this statement and present the fractions across demographic groups in Table I. For brevity we refer to this variable as *Clean planet* in the tables of results. This response is more prevalent among women, those with lower income, the highly educated, and city dwellers. The results on age are u-shaped, with Clean planet being more common for those at the peak of their working age, rather among the youngest in our sample.

Although the preceding question is intended to home in on individuals who have preferences for ESG-portfolios based on non-pecuniary motives, these individuals may also believe that investing in ESG-tilted portfolios offers a good risk/return tradeoff. To better identify ESG-aware attitudes as a distinct from ESG-motivated attitudes, we also ask respondents to what extent they agree that sustainable investments outperform, and whether they are prepare to pay higher fees for financial products with that focus exclusively on green investments:

- *Higher return.* "Environmentally sustainable investments generate higher returns in the long run." (14%)

- *Higher cost.* "I'm willing to pay higher fees for a fund that only makes sustainable investments." (9%)

About 14% strongly agree to the statement that green investments outperform, 30% agree and less than 13% disagree to some extent. The willingness to pay higher fees for green investments has less support. Only 9% strongly agree, 32% agree, while 17% disagree to some extent.

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[5]Related measures of personal values include Hong and Kostovetsky (2012) who relate political affiliation to SRI investments and Kahan et al (2012) who relate individualism vs. collectivism to beliefs about climate change. Similarly, Bolton et al (2020) use proxy votes to infer preferences for sustainability vs. pure financial considerations among institutional investors.

These measures are correlated, as we confirm in the appendix. While they are intended to capture specific motivations behind a pro-ESG stance, they can be taken together as an expression of a general preference for ESG-tilted investments, as in Pastor et al (2019). To capture this broader preference succinctly, we average the raw responses from the three variables (assigning -2 to strongly disagree and +2 to strongly agree so that a middle score has a value of zero) and present that beside the individual measures in Table I. We refer to this variable as *Environmental preferences* in the tables of results. Urban dwellers, especially those who live in areas with high Green Party voter support, score high on this measure. Those who studied environment-related fields, or biology, score highest on this measure.

<div align="center">Table II here</div>

Finally, we add three statements to gauge how our measures of environmental value orientation relates to household everyday environmental behaviours:

- *Green products*. "I am willing to pay more for environmentally friendly products." (28%)

- *Recycles more*. "I recycle a great deal more than my neighbors." (15%)

- *Never checks pension*. "I never review my retirement savings." (26%)

These variables are summarized in Table II and are grouped together because they are based on self-reflections of one's behaviour and time use. The idea behind *Green products* and *Recycles more* is to capture pro-environmental engagement in ordinary, day-to-day consumer transactions as both a test of the validity of our measures of investor sentiment, as well as a point of contrast against measures of financial engagement. The responses to the question about green products reflect a strong willingness to pay for environmentally friendly products in Sweden: 28% of survey respondents strongly agree to this statement, 41% agree, while only 10% disagree to some extent. Our recycling question is "Which sentence best describes how much you recycle?" Potential answers ranges from "A great deal less than my neighbors" to "A great deal more than my neighbors". Only 7% of respondents believe that they recycle less, but 43% believe that they recycle more than

their neighbors which is an illustration of overplacement and the well-known "better than average" effect (see Svenson (1981)).

The question "How often do you review your retirement savings" is intended to gauge the degree of a respondent's engagement in financial matters that are important for household financial planning decisions. While 16% state that they do so several times per year, and 51% at least once a year, 26% report that they never do so. We use the response "I never review my retirement savings" as a dummy variable indicating disengagement, and refer to this as *Never checks pension* in the tables of results.

Our survey also includes questions measuring financial and environmental literacy. For financial literacy, we use the "Big-5" test first developed by Lusardi and Mitchell (2007). To measure environmental literacy in a comparable manner, we develop and administer a five-question test aimed at capturing knowledge of the environmental aspects of various household consumer choices. These measures are discussed in detail in the Appendix.

2.2 Stock Ownership and Pension Savings Data

To complete our dataset we connect the behavioural measures obtained through the survey described above to data on direct stock ownership and pension fund holdings. The average level of stock market participation in Sweden is high by international standards. For example, direct stock ownership as a fraction of total savings is considerably larger in Sweden than the US. Sweden had the second largest share of direct stock ownership in Europe in 2017.[6] Sweden ranks third among European countries in terms of share of savings allocated to mutual funds. The Swedish premium pension plan, which is excluded from the European statics and which we explain in more detail below, in effect also make the whole working population mutual fund investors. Swedes are also important owners of financial assets on an absolute scale, ranking ninth in Europe after Spain and Ireland, but before Denmark, Austria and Finland.

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[6]Data from the European Fund and Asset Management Association, www.efama.org.

2.2.1 Direct Stock Ownership

The individual stock data is obtained from Euroclear, Sweden's central security repository. We obtain stock ownership of listed individual Swedish equities for 2016, which is matched anonymously to our survey data. This file contains the identity of individual stocks, number of stocks held and market value at the end of each year. This is our measure of stock ownership, where we find that 946 respondents held equity in 471 firms. Stock ownership in our sample is slightly higher than the average 23% for the whole population.

Table III here

Panel A of table III presents the holdings of individual stocks. The stock ownership sample covers 476 firms, and as can be seen in the size break-up, many of them are very small. Even if the average firm has a market capitalization of SEK 14 billion (about USD 1.6 billion), 75% of the firms have a market cap well below one billion dollars, which makes it very difficult to match the majority of firms on ESG-measures that normally are available only for big firms through standard data vendors. Instead, we turn to Statistics Sweden, who maintains a data base over aggregate Scope 1 carbon dioxide emissions across industries. We match firms to this data set on two-digit standardized industry codes (SNI) to assign each firm to 37 industries. This way, we obtain an overall measure for the carbon intensity of the industry for each company's stock. We also identify 16 energy stocks through the same industry classification of which eleven operates within the oil and gas sector..

Stock ownership in our sample is slightly higher than the average 23% for the whole population. The stock ownership sample is skewed as can be seen from the size break-up, where the average portfolio holding is SEK 597,000, but the median just above SEK 33,000. The average number of stocks in the portfolio is 4.4 and the median is 2, which indicates that many portfolios are small. The median value of the holdings is SEK 6,420 (less than one thousand USD). Some portfolios are large—the maximum number of stocks in the portfolio in our data is 42.

2.2.2 Premium Pension Plan

Our second data source comes from the Swedish pension system. The Premium Pension Agency (PPA) shares data on investments and trades for the mandatory Swedish premium pension plan launched in 2000, which is a national, tax-shielded plan similar to corporate-sponsored 401(k) plans in the US. A total of 2.5% of worker's wages are directed into a designated personal account, and investors can choose up to five funds from the participating pool of around 900 funds (892 at the end of 2017). Investors who do not actively make a choice gets their contribution allocated to a well-diversified, target-date, default fund. The objective of maintaining a high level of diversification means that the fund has investments in all main equity markets and industries. The Swedish premium pension system is described in detail in Palme, Sunden, and Söderlind (2007) and has been analyzed before in for instance Cronqvist and Thaler (2004) and Dahlquist and Martinez (2015). A particular advantage of the system is its mandatory component with a fixed contribution proportional to income, making it possible to abstract from potentially important selection bias that would arise from generalizing decisions from people within a given voluntary pension plan with variable contribution rates.

Panel B of Table III shows that there are 3,667 people in the plan among the 3,993 collected survey responses at the end of 2017. Around two-thirds of the savers had made an active choice at some point participating in the pension plan, one-third never made a choice and so hold only the default fund.

In 2004, the PPA introduced a designation to indicate whether a fund followed environmental and social guidelines. This designation allows fund companies to label themselves as funds that invest with restrictions determined by ethical or environmental considerations (so-called *negative selection* funds as in Hong and Kacperczyk (2009)). This designation takes the form of a green leaf that appears in the fund description, and appears in all information and marketing about the funds, but there is no standard or minimum requirements given by the PPA to which funds must adhere in order to earn this designation. From 2018 and onwards, after our sample period, all mutual fund companies on the premium pension platform are required to follow the UN Principles for Responsible Investment. At the end of 2017 about one-third of the funds (331 out of 892) carried this label. At the same time, almost 74% of individuals who have made an active choice hold

some ESG-labeled funds in their portfolios, while 58% hold a majority of their portfolio in ESG-labeled funds, and 34% of respondents hold an all-ESG portfolio in their pension accounts.

When the flag was introduced, the PPA announced that the default fund would also apply ethical guidelines and exclusion strategies for non-compliant firms, ostensibly making it a green fund.[7] Yet at the same time, the fund's mandate requires it to be globally diversified, and indeed, it has been widely criticized in the Swedish press for holding sizable positions in heavy-polluting companies, particularly in the fossil fuel industry. Because of this, it is unclear whether holding the default fund should be considered "making a green choice." As such, we provide distinct analyses based on whether or not holding investments in the default fund is taken as evidence of making a green choice (along with evidence later in the paper that speaks against the green-choice interpretation).

We also manually flag funds if the name of the fund suggests that the it has a socially responsible investment profile. There are 46 funds containing keywords suggesting that they follow guidelines related to sustainability. Labels are based on nine keywords: "SRI", "ESG", "Sustainable", "Environmental", "Green","Ethical", "Clean", "Earth" and "Water", appearing either in Swedish or English. Of the 2,474 respondents who made an active choice, we find that 1,827 had at least some exposure to ESG-labeled funds, while 167 respondents held ESG-named funds in their portfolio.

There is no reason, based on objective classification or ESG-reporting criteria, to believe that a green-*named* fund is greener than a green-*labeled* fund. (Indeed, Cooper, Gulen, and Rao (2005) and Cooper, Dimitrov, and Rao (2001) illustrate how name changes can be used to manipulate investor perceptions.) Yet because some funds have ESG-related information in the name itself, while other funds can only be determined as ESG-compliant by consulting marketing materials, the two labeling standards for ESG-funds allow us to test an information-related hypothesis concerning ESG-tilted fund ownership. Specifically, if information about the fund's actual investment behaviour provides a barrier to financial decision-making, we would expect the connections between pro-environmental preferences and ESG-tilted portfolios to be stronger for the ESG-named funds, where their status is more transparently available to the investor. This is a weak test because

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[7]There were 65 blacklisted companies in 2018, meaning that they were classified as violating international norms regarding the environment, human rights, labor rights or corruption.

the flag that indicates ESG-compliance is clearly available in publicly available marketing materials. Another mechanism that could drive a difference in uptake between the types of funds is trust in the labeling system: perhaps investors find the ESG-compliant label ambiguous, while a fund using ESG-related terms in its title itself sends a more credible signal of its ESG-related intentions. Note however that under this mechanism, the channel connecting investor behaviour to investment choices is still sophistication in information processing.

3   Do Green Households Hold Green Retirement Portfolios?

For the central part of our analysis, we explore the connection between our measures of environmental attitudes and portfolio holdings in the Swedish pension system. We start here because the mandatory nature of the retirement system means that we can explore issues related to financial engagement and the expression of environmental beliefs with less concern that unobserved variation in idiosyncratic liquidity considerations or other household situational factors confound our analysis. In other words, we start here because every working age individual contributes on an equal basis proportional to their income, and every contributor has access to the same investment information, albeit concerning a very large menu of approximately 900 mutual funds from which to choose. The only question is whether they use this information to hold portfolios that express their environmental beliefs.

To frame the question in the simplest possible terms, we begin by taking the full sample of all 3,667 survey respondent retirement accounts and ask whether green households hold green portfolios. We consider two possibilities based on the categorization of the default fund. In the first, we assume that the default fund is not a green choice because of its index benchmarking across industries which may appear controversial for green investors. We code a dummy to be equal to one for portfolios containing 100% ESG-funds based on this assumption and label it Active ESG. Then we repeat the analysis but code the default fund as ESG-compliant. This assumes that investors in the default fund made a conscious decision not to move their money out of the default fund because they deemed it to be sufficiently ESG-compliant. We will evaluate the reasonableness of that

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assumption below.

Table IV displays the results. In Columns (1) through (3) the dependent variable is coded so that the default fund is not a green choice. The regressions control for income, age, gender, education, population density and green party voting outcomes. The Clean planet variable loads negatively on making an active ESG choice, but is only significant at the 10 % level. This holds when we separately categorize ESG-aware and ESG-motivated invested by including measures of willingness to pay a higher cost for green funds or believing green investments generate higher returns. Of course, as discussed in Section 2, these variables are highly correlated, and therefore multicollinearity may be driving the lack of a result. To account for this, we replace the three distinct measures with their sum in order to proxy for a general ESG-preference, as in Pastor et al (2020). This is presented in Column (3). The pooled measure of green preferences is also insignificant. The results offer no evidence that pro-environmental investors choose greener portfolios.

Table IV here

What if, instead, we assume that leaving retirement savings in the default fund is making an active choice to be green? Columns (4) through (8) of Table IV explore this interpretation of the default option. Here the dependent variable is coded one if ESG-labeled or default fund, zero otherwise. (Thus, an individual must make an active brown choice in order to not be considered green.) Again, the clean planet variable does not predict that respondents hold green investments, even if the default is considered to be an active choice to hold an environmentally sensitive portfolio. Higher return, one of the proxies for "ESG-aware," is significant at the ten percent level. When we combine these three into the more general measure of green preferences in Column (6), the resulting variable is significant at the 1% level.

Interpreting this as making a green choice requires the assumption that pension savers knowingly choose to leave their investment in the default fund because of their understanding of its pro-ESG properties. To asses the validity of this assumption, we split the sample on financial literacy. Columns (7) and (8) report sub-samples based on low and high financial literacy respondents, respectively, where high financial literacy is indicated by answering the Big-3 financial literacy questions correctly. All the significance in Col-

umn (6) is coming from the high financial literacy sub-sample. This suggests that this interpretation is only relevant among financially sophisticated individuals.

Thus, the results of Table IV provide weak evidence, at best, in favor of the idea that green households hold green portfolios. There is some evidence that green households do not actively seek out brown portfolios, but this relies on assuming that leaving savings in the default fund—making no choice at all—is making the green choice. This stands somewhat in contrast to Riedl and Smeets (2017) and Brière and Ramelli (2020) who show that evidence for increased sustainable investments among those with green-oriented values, as well as results in Giglio et al (2020), who survey sample high net worth individuals exclusively, and find that beliefs about discount rates and expected returns are reflected in the investment decisions people make.

To understand why there is no relation between green beliefs and green investments, we decompose the decision into (a) whether to leave their investment in the default fund, and (b) whether to make green investments conditional on leaving the default fund. This is presented in Table V. Columns (1) through (3) of Table V presents the results of a Probit regression where the dependent variable is an indicator for making an active choice. Column (1) shows that active investors are those with higher financial literacy, but there is no connection between environmental literacy and active pension choice. The Clean planet variable is associated with about a 7% lower probability of making an active choice. In Column (2), we introduce the environmental measures designed to identify ESG-aware investors. Although they come in with a negative sign, indicating a lower probability of active choice, they are not statistically significantly different than zero. Thus, Columns (1) and (2) taken together show that ESG-motivated investors are less likely to make an active retirement choice (of any kind, green or not) while ESG-aware individuals are not different than ESG-naive investors. Column (3) presents the pooled, general measure of green preferences, which shows that general environmental preferences are associated with less active choice, significant at the 10% level.

Table V here

The first three columns do not distinguish between green or brown active choices, only whether the respondent made an active or passive choice in the retirement system. Beginning in Column (4) of Table V, we focus on the 2,474 investors who made an active

choice. The dependent variable is the weight that ESG-labeled funds have in the respondent's portfolio. There is no evidence that any measure of green orientation is related to holding a green retirement portfolio.

There are a number of potential hypotheses behind the lack of financial engagement by the environmentally engaged. Because many environmental activists are often critical of financial institutions, corporations, and capitalism in general (Kaustia and Torstila (2012)), financial disengagement could be a way to show allegiance to environmental causes, a form of virtue-signaling. Or it could simply reflect the fact that financial decisions are often complex. To explore these hypotheses, in Column (7), we include only the 1,738 investors who get the Big-3 questions correct on the financial literacy test. If virtue-signaling were solely responsible, we would not expect to find a difference here, but if informational hurdles are important, we would expect a tighter link between values and investments in this sample. Indeed, here we find evidence that green values are related to green investment. This echoes the results presented in Column (8) of Table IV.

To explore the role of informational hurdles further, in Columns (8) through (10) we redefine ESG-investment by focusing on ESG-named funds, rather than funds with an ESG flag available in the Premium Pension marketing materials. The idea here is that if ESG-signals are present in the fund's name itself, individuals who lack the financial sophistication to engage with the prospectus and marketing materials can nevertheless select these funds based on name alone. The dependent variable now is the portfolio weight in funds that contain some key word suggesting that it is environmentally or ethically compliant. In Column (8) we see a highly statistically significant positive loading on Clean Planet, indicating that ESG-motivated investors are more likely to hold these funds. This result fades in Column (9), when we include the other measures of environmental engagement, but this may be due to the high correlation between the three measures. In Column (10), we account for this correlation by replacing the individual ESG measures with the broader environmental preferences variable. Here again we see a highly statistically significant positive relationship between holding an ESG-named.

In sum, this evidence indicates that green households do not, on average, actively choose green retirement portfolios. One key challenge behind their lack of choice is the information hurdles associated with making the choice; even if ESG-compliant funds are

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labeled clearly, in a menu of almost 900 funds, the task of choosing a green portfolio in line with one's environmental preferences can be daunting. In line with this hypothesis, we find that only the highly financially literate select ESG-labeled funds in keeping with their environmental preferences when accessing the label involves consulting performance information provided by the Premium Pension system. When the informational hurdle is lowered, we do see uptake of funds that advertise their sustainability focus through their name among individuals people with a strong, pro-social value orientation.

4 Do Green Households Buy Green Stocks?

For additional evidence on the role of financial disengagement, we turn to direct stock holdings. The very act of owning stock itself is a measure of financial engagement, because unlike the premium pension plan, which is a mandatory-participation plan, in order to own stock in the first place a respondent has to take the active step of opening an account at a brokerage and making a stock purchase. Presumably respondents who belong to this group are much closer in disposition and sophistication to those surveyed in Giglio et al. (2020). Do we see green preferences manifest in green portfolio holdings in this group?

To explore this question, in the first three columns of Table VI we study whether green households are likely to be direct stock owners. Here, the dependent variable is an indicator equaling for who own shares, zero otherwise. The control variables show that stock owners tend to be higher income, older, male, university-educated property owners with an economics/business degree. They also tend to have higher financial literacy, which is in line with the results in Van Rooij, Lusardi, and Alessie (2011). Column (1) shows a negative loading on Clean planet, statistically significant at the 10% level, which indicates that ESG-motivated people are less likely to own stocks. In Column (2), the high correlation between the three variables measuring environmental attitudes renders them statistically insignificant, but in Column (3), when we use the broader measure of environmental preferences, we find a strong, negative relation between environmental preferences and direct stock ownership. This is further evidence supporting the idea that environmentally engaged households are financially disengaged.

Table VI here

Nonetheless, some households with pro-environmental preferences do own stock directly. In the remainder of the table we focus on the 976 individual stockholders to explore whether environmental engaged households with high financial engagement express their green preferences through their stockholdings. In Columns (4) through (6) the dependent variable is a dummy variable for whether the individual holds stocks in the energy sector. This is a natural place to explore the tension between ESG-motivated and ESG-aware investors. Because oil consumption is so heavily implicated in climate change, environmentally motivated investors are likely to eschew energy stocks for virtue-signaling motives, while ESG-aware investors may see profit opportunities as oil companies embrace alternative sources of energy production. Also, as we discussed in Section 2, these stocks include eleven stocks in the oil and gas sector, but five belonging primarily to the solar, wind and hydro energy sector. Less sophisticated investors may be unaware of the potential for energy stocks to include companies that focus on renewable energy.

In Column (4) we find weak evidence that ESG-motivated stockholders are less likely to hold energy stocks. There are no students of environmental science that hold energy stocks, so the variable is dropped from the regression. The Clean planet variable has a negative loading, but is statistically insignificant. When we introduce the proxies for ESG-aware and include them alongside the ESG-motivated measure, we indeed see evidence supporting the predictions of Pedersen et al (2020). In particular, we find a strong positive loading on Higher returns, and a strong negative loading on Clean planet. The interpretation here is that ESG-motivated individuals are loathe to hold energy stocks because they derive disutility from holding portfolios that can be construed as contributing to pollution, whereas ESG-aware investors tilt their portfolios in favor of these stocks, either because they expect positive cash flow shocks or because, along the lines of Hong and Kostovetsky (2012) they anticipate earning excess returns for holding sin stocks. In Column (6) the opposing signs cancel each other out and we find no effect on our general measure of environmental preferences. While this could be viewed as a statistical artifact, it is also in keeping with the interpretation that there is weak evidence supporting the idea that green investors hold green portfolios because the "people's capitalism" motive for holding energy stocks cuts against the virtue-signaling motive for avoiding them.

To further explore the role of informational impediments preventing the expression of green preferences, in Columns (7) through (9), we replace the sector classification with the measure of sector-level carbon dioxide emission described in Section 2. The comparison between energy sector holdings and holdings based on sector carbon emissions tests the information hypothesis in a manner analogous to the comparison presented in the previous section between ESG-labelled and ESG-named mutual funds. We present OLS regressions in which the dependent variable is the portfolio carbon dioxide emissions. Here, there is no connection between a stock holders' green orientation and the carbon footprint of their individual stock portfolio.

To summarize, direct stock ownership is presumably a channel through which people with more sophistication and enthusiasm engage in financial markets. Environmentally engaged respondents are significantly less likely to belong to this group, even controlling for demographic factors like wealth and age, which affect stock market participation. Yet by focusing on those individuals who do hold stock, we can shut down the extensive margin of participation and examine portfolio holdings among a selected set of high-participation individuals. When we do, we find that green preferences manifest in stock holdings through both a virtue-signaling and a cash-flow channel. Consistent with the evidence presented above showing that information hurdles present a challenge to green investing, when we replace the sector classification with a more scientifically precise, but more difficult to observe classification, we find no evidence that green investors tilt their investment towards portfolios with lower carbon emissions.

5   More Evidence on Financial Disengagement

The preceding sections points to financial disengagement as a key reason why green investors do not hold green retirement portfolios. In this section we further explore the mechanisms behind this disengagement. To explore this further, our final piece of analysis considers engagement across different domains. This helps guard against the possibility that our results stem from the survey questions having low power to detect engagement because they measure preferences with error. It also helps illustrate differences in attention across domains of household decision-making that are important for under-

standing our main findings.

Table VII presents results from three types of engagement. In Columns (1)-(3), the dependent variable is a dummy equaling one if the respondent strongly agrees with the statement "I am willing to pay more for environmentally friendly products." Column (1) shows a strong positive loading on Clean planet, our measure of ESG-motivated households. In Column (2) we include the ESG-motivated measure alongside the ESG-aware measures, a willingness to pay higher fees and a belief that green investments outperform. All three carry highly statistically significant, positive loadings. The third column replaces these three with the sum to obtain a broader measure of ESG preferences. Each of these three specifications shows a clear link between our measures of environmental attitudes and a measure of environmental engagement.

Table VII here

The next three columns focus on whether respondents think they recycle more than their neighbors. This is coded as a dummy equaling one if respondents strongly agree to that statement. Here we see a pattern in loadings consistent with the previous three columns, where each of the environmental attitudes variables carries a large, highly statistically significant loading. The control variables include a dummy for living in an area with a high Green Party vote count in the last election, which carries a negative sign, indicating that respondents are less convinced that they recycle more than their neighbors in areas where there neighbors harbor similarly pro-environmental views. This is encouraging as a safety check that survey respondents are answering thoughtfully.

Columns (7) through (9) of Table VII turn to a measure of financial engagement, where the dependent variable is an indicator variable equaling one for those who report that they never check their pension balance. High financial literacy respondents are much less likely to be those who never check their retirement balances.[8] In contrast, respondents with strong environmental values are more likely to respond that they never check their balance. Interestingly, in Column (8) when we introduce the measures intended to proxy for ESG-aware investors, we do not see the same pattern as in the environmental engagement measures. A willingness to pay higher fees for green mutual funds and believing

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[8]The unreported control variables show that older and wealthier respondents are less likely to report that they never check their retirement balances.

that green investments outperform is not associated with being less likely to check retire-ment pension balances. This supports the ESG-awareness interpretation of the Higher Cost and Higher Return variables, because ESG-aware investors derive no special util-ity from being green, they simply see profit opportunity, therefore they are less likely to eschew financial engagement on virtue-signaling grounds.

To explore this further, the remaining six columns focus on interest in environmen-tal and financial matters. If virtue-signaling motives generate less financial engagement among ESG-motivated individuals, and less common among ESG-aware investors, we should see both types of investors interested in environmental matters, but only ESG-motivated individuals interested in financial matters. In Columns (10) through (12) we find a robust relationship between environmental interest and our measures of both ESG-awareness and ESG-motivation. This holds whether we treat them separately or whether we aggregate to the broader measure of ESG preferences. But in Columns (13) through (15), we see that only a measure of ESG-awareness is significantly correlated with finan-cial interest. In particular, in Column (14), when we include ESG-awareness measures (Higher return and Higher cost) alongside ESG-motivation (Clean planet), we see that there is a strong positive relationship between Higher returns and financial interest, but a weak negative relationship in the other measures. In line with previous results, this suggests that people need to show an interest in finance in order to form return expecta-tions about green investments. The positive correlation in these measures is likely behind the modest positive loading in Column (13), but when we combine these measures into an aggregate measure of general environmental interest (column 15), we see no relation between financial interest and green preferences.

Of course, respondents with strong environmental orientation may not *actually* recycle more than their neighbors, they may not *actually* pay more for environmentally friendly products: the literature on motivated reasoning (Carlson et al (2020) and FeldmanHall et al (2012)) shows that people may misremember their past actions in order to main-tain their moral self-image or act self-serving when faced with real choices. Whether or not people actually engage in these behaviours is less important for our findings in this section, because in contrast, their retirement planning responses point to disengage-ment with financial markets, especially for ESG-motivated investors. Under a motivated

reasoning explanation, financial engagement is not part of the moral self-image that environmentally engaged respondents wish to maintain (see also Brière and Ramelli (2020)). The contrast between ESG-aware and ESG-motivated investors regarding the degree to which they are interested in financial matters bears this out: it suggests that the virtue-signaling motives behind a lack of financial interest are consistent with the idea that the positive utility that attaches to holding ESG funds for ESG-motivated goes hand in hand with a willful disengagement from financial matters.

6 Conclusion

This paper shows that households with green preferences by and large do not make green financial decisions. There are two key factors that drive this result. The first is financial disengagement. Households that exhibit strong pro-environmental behaviors and beliefs are financially disengaged and generally uninterested in financial matters. In a mandatory-participation national retirement plan, they are less likely than others to check their retirement balance, and they are less likely to make an active allocation decision, instead relying on the default. Outside their retirement plan, they are less likely to own individual stocks.

The second factor appears to be informational constraints associated with making green investment decisions. Simply put, making green investment decisions involves added layers of informational complexity that prevent less financially sophisticated individuals from expressing their green preferences in their portfolio holdings. For example, among investors who do make an active choice in their retirement portfolios, environmentally oriented investors are more likely to buy mutual funds with pro-environmental names, but they are not more likely to buy funds that are labeled as ESG-compliant in the more complex, statements and investment information that households receive every year. Individual stockholders—i.e., individuals who have made an active stock market participation decision—hold stocks in a manner consistent with environmental preferences when we classify stocks according to whether they are in the energy sector, but there is no connection between their preferences and their stockholdings when we rank according to a more complex measure, the carbon emissions ranking of the industry in

which the company operates.

Our findings have policy implications. Policy makers, regulators, and financial market participants are currently in a debate over how much ESG-related information should be made available to market participants. Some argue that more information is essential for sound decision-making, while others argue that additional information can easily overwhelm decision-makers because the information is too complex. Indeed, in a public statement on August 26, 2020, SEC Commissioner Allison Lee argued that "It's time for the SEC to lead a discussion—to bring all interested parties to the table and begin to work through how to get investors the standardized, consistent, reliable, and comparable ESG disclosures they need to protect their investments and allocate capital toward a sustainable economy." Our findings suggest that is likely necessary, but not sufficient, for most households' environmental preferences to be expressed through their portfolio choice decisions. Financial sophistication—the ability to digest and act upon that information—is a necessary pre-condition for this information to steer capital towards more sustainable uses.

The fact that greener households do not generally hold greener portfolios cuts in two directions in terms of the debate around whether firms should pursue social and environmental responsibility at the behest of their shareholders. On the one hand, one can argue that firms have no special environmental obligation vis-a-vis their shareholders because clientele effects in terms of environmental preferences are blunted by the lack of financial engagement: if brown investors hold green stocks and green investors hold brown stocks, why should companies go green on behalf of their shareholders? The opposing argument, however, is that *all* firms should pursue pro-ESG policies because aggregate preferences towards green investment are far broader than would be suggested by the relatively small group of investors who are both financially engaged *and* environmentally engaged. One potential remedy here would be to concentrate the task of gathering and processing ESG-related information into the hands of financial intermediaries, such as fund managers, rather than leave this to individual shareholders. The EU taxonomy to assist with incorporating ESG factors into financial decision-making is one such effort on this front, but our findings suggest that it will be challenging to strike a balance between clarity and simplicity required to facilitate decision-making and an accurate

representation of the complexities of climate impact.

These results also have implications for ongoing theoretical research. Although when we focus on high-engagement subsamples we find clear evidence consistent with the predictions of recent theoretical models, the fact that financial engagement is so low among most environmentally engaged households suggests that the economic mechanisms at work in these models may have limited empirical traction. Our results suggest that an important topic for future work is incorporating limited participation, limited financial sophistication, or else incorporating financial intermediaries who act at the behest of their constituents, into models in which investors harbor environmental informed preferences.

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Table I: Sample Characteristics

This table reports summary statistics, average test scores and sample proportions of the key survey questions. The first two columns shows the sample proportions and the corresponding population average for Sweden. Columns labeled Green Beliefs show the proportions of respondents strongly agreeing to the three statements: "A clean planet is more important to me than financial welfare" (Clean planet); "In the long run, environmentally sustainable investments generate higher returns" (High return) and "It is worth paying higher fees for a mutual fund that only make environmentally sustainable investments" (High cost). Green preferences is an average of the three questions, where each question is scored from -2 (Strongly disagree) to 2 (Strongly agree). The columns labeled Green Behaviour show the fraction strongly agreeing to the statements "I am willing to pay more for environmentally friendly products" (Green products) and "I recycle a great deal more than my neighbors" (Recycles more). The two columns labeled Literacy Scores present the average score from the financial and environmental tests, where the maximum score is 5. The final column shows the proportion of respondents holding individual stocks in sample. The sample is compared across gender, age, income and education where information about the underlying population is provided by Statistics Sweden. In addition, there are indicator variables for whether the subject having studied Economics/Business or Biology/Geography/Environmental science at any level since high school. Urban is a dummy variable for those living in any of the 12 main cities of Sweden and Green Party a dummy for the highest quintile of green voting districts. There are 3,933 individuals in the sample.

| | Proportions | | Green Beliefs | | | | Green Behavior | | Literacy Scores | | % Owns |
	Sample	Pop.	Clean planet	High return	High cost	Env. pref.	Green products	Recycles more	Fin.	Env.	Stock
Overall	1.00	1.00	0.25	0.14	0.09	0.47	0.28	0.15	3.14	2.27	0.24
Pop. Wtd.	.	.	0.25	0.16	0.09	0.46	0.27	0.15	2.93	2.23	0.19
Gender											
Men	0.49	0.51	0.23	0.13	0.08	0.36	0.25	0.13	3.44	2.32	0.31
Women	0.51	0.49	0.28	0.15	0.10	0.58	0.31	0.16	2.85	2.22	0.18
Age											
18-24	0.10	0.15	0.20	0.13	0.08	0.37	0.20	0.13	2.69	2.32	0.12
25-34	0.15	0.23	0.26	0.17	0.13	0.49	0.36	0.14	3.03	2.30	0.18
35-44	0.18	0.21	0.31	0.16	0.11	0.53	0.36	0.14	3.28	2.35	0.26
45-54	0.25	0.22	0.24	0.12	0.09	0.45	0.27	0.15	3.26	2.26	0.25
55-65	0.32	0.19	0.25	0.12	0.07	0.48	0.24	0.15	3.15	2.21	0.30
Income											
0-111	0.15	0.25	0.27	0.17	0.10	0.47	0.27	0.15	2.72	2.31	0.11
111-287	0.32	0.25	0.26	0.15	0.09	0.51	0.26	0.17	2.83	2.25	0.17
287-399	0.29	0.25	0.24	0.13	0.09	0.50	0.28	0.13	3.18	2.21	0.23
399+	0.24	0.25	0.24	0.10	0.08	0.38	0.33	0.13	3.79	2.35	0.44
Education											
Some school	0.10	0.17	0.18	0.17	0.08	0.37	0.21	0.15	2.59	2.21	0.15
High school	0.38	0.44	0.21	0.12	0.05	0.40	0.20	0.15	2.84	2.17	0.22
University	0.52	0.39	0.30	0.14	0.12	0.54	0.36	0.14	3.48	2.37	0.29
Studied Env/Bio	0.02	.	0.34	0.18	0.17	0.62	0.52	0.28	3.62	2.65	0.25
Studied Econ/Bus	0.10	.	0.23	0.14	0.09	0.44	0.27	0.17	3.52	2.16	0.32
Location											
Urban	0.34	.	0.29	0.15	0.12	0.54	0.35	0.12	3.32	2.34	0.26
Rural	0.66	.	0.23	0.13	0.07	0.44	0.25	0.16	3.05	2.24	0.23
Green Party	0.20	.	0.32	0.14	0.13	0.54	0.36	0.12	3.33	2.35	0.28

Table II: Key Survey Questions

This table tabulates responses to which extent respondents agree or disagree to statements related to environmental views and household behaviors. The questions have been translated from Swedish into English. Boldface indicates the definition of dummies, taking the value of one and zero otherwise. There are 3,993 responses except for the pension planning question, which has 3,978 responses.

A. Environmental Views

- *Clean planet.* "A clean planet is more important to me than financial welfare."

    1. **Strongly agree (1,015, 25.4%)**
    2. Agree (1,561, 39.1%)
    3. Neither Agree nor Disagree (1,016, 25.4%)
    4. Disagree (203, 5.1%)
    5. Strongly disagree (96, 2.4%)
    6. Don't know/Prefer not to say (102, 2.6%)

- *Higher return.* "Environmentally sustainable investments generate higher returns in the long run."

    1. **Strongly agree (551, 13.8%)**
    2. Agree (1,198, 30.0%)
    3. Neither Agree nor Disagree (1,490, 37.3%)
    4. Disagree (312, 7.8%)
    5. Strongly disagree (196, 4.9%)
    6. Don't know (246, 6.2%)

- *Higher cost.* "It is worth paying higher fees for a mutual fund that only make environmentally sustainable investments."

    1. **Strongly agree (361, 9.1%)**
    2. Agree (1,249, 31.6%)
    3. Neither Agree nor Disagree (1,232, 31.2%)
    4. Disagree (447, 11.3%)
    5. Strongly disagree (320, 8.1%)
    6. Don't know (342, 8.7%)

B. Household behaviours

- *Green products.* "I am willing to pay more for environmentally friendly products."

    1. **Strongly agree (1,138, 28.5%)**
    2. Agree (1,623, 40.6%)
    3. Neither Agree nor Disagree (723, 18.1%)
    4. Disagree (276, 6.9%)
    5. Strongly disagree (161, 4.0%)
    6. Don't know/Prefer not to say (72, 1.8%)

- *Recycle more.* "Which sentence best describes how much you recycle?"

    1. **A great deal more than my neighbors (581, 14.6%)**
    2. Somewhat more than my neighbors (1,144, 28.6%)
    3. About the same as my neighbors (1,865, 46.7%)
    4. My neighbors recycle somewhat more than I do (223, 5.6%)
    5. My neighbors recycle a great deal more than I do (54, 1.4%)
    6. Don't know/Prefer not to say (126, 3.2%)

- *Never checks pension.* "How often do you review you retirement savings?"

    1. Several times per year (658, 16.5%)
    2. Once a year (1,371, 51.0%)
    3. When I start or change my pension plan (617, 15.5%)
    4. **Never (1,030, 25.9%)**
    5. Don't know/Prefer not to say (302, 7.6%)

Table III: Holholdings of Stocks and Pension Funds

This table display details of stock ownership data obtained from Euroclear and mutual fund data from the Premium Pension Agency (PPA). Panel A displays market capitalization and industry carbon emissions for 476 firms that appear in the holdings of 976 investors in sample. All firms are matched to two-digit industry Scope 1 carbon dioxide emissions obtained from Statistics Sweden. The size of the portfolios are reported in quintiles of market value and number of stocks. Panel B displays details of the pension data at the end of 2017. There were 892 mutual funds available for investment of which 331 labeled environmental or ethical compliant (ESG). The mutual fund sample contains 3,667 respondents broken up on those who have made an active choice and so are not in the default fund. ESG-holdings are presented separately for funds with names suggesting that they focus on sustainable investments (ESG name) where reported fractions corresponds to those having a positive weight in each category.

Panel A: Stock holdings

Firms	Mean	Q1	Q2	Q3	N
Market cap (SEK m)	18,038	256	1,287	8,407	476
CO_2 emissions (kilotons)	463	62	145	795	476

Portfolios					
No. of stocks	4.4	1	2	5	976
Portfolio value (SEK k)	597.5	6.8	33.3	121.7	976

Panel B: Pension accounts

Funds	All	ESG-Labeled	ESG-Named
No. of funds	892	331	46
Percent (of All)	100.0%	37.1%	5.2%

Activity	All	Active	Default
No. of investors	3,667	2,474	1,193
Percent (of All)	100.0%	67.5%	32.5%

ESG holdings	All	ESG-Labeled	ESG-Named
No. of investors	2,474	1,827	167
Percent (of All)	100.0%	73.8%	6.8%

Table IV: Do Green Households Hold Green Pensions?

This table presents the results of Probit regressions where the dependent variable takes the value of one for the respondents having an all ESG portfolio (100% allocation) under two assumptions regarding the pro-environmental orientation of the default fund. Columns (1) through (3) classifies the default option as being a non-ESG fund, and Columns (4) through (6) as being an ESG fund. Independent variables include log of disposable income and age which is scaled and divided by ten. Urban and Green party measures the population density and share of Green Party votes within the municipality of the respondent. Female. University, Env./Bio and Bus./Eco. student are indicator variables for females, subjects having at least completed one university course or having studied Economics/Business or Biology/Geography/Environmental science at any level since high school. Columns (7) and (8) splits the sample into those that answered all the "Big-3" financial literacy correctly or incorrectly (labeled Low versus High financial literacy). The survey data is matched to 3,667 accounts obtained from the Premium Pension Agency (PPA). The table reports marginal probabilities. Robust standard errors within parenthesis where *, ** and *** denote significance at the 10%, 5% and 1% level.

VARIABLES	Active ESG			Passive ESG				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Clean planet	-0.026*	-0.032*		0.031	0.009			
	(0.016)	(0.017)		(0.020)	(0.022)			
Higher cost		-0.005			0.044			
		(0.026)			(0.031)			
Higher return		0.024			0.046*			
		(0.023)			(0.027)			
Green preferences			0.001			0.023**	0.010	0.029**
			(0.009)			(0.011)	(0.020)	(0.014)
Env. Lit.	-0.002	-0.002	-0.003	-0.003	-0.003	-0.002	-0.016	0.006
	(0.007)	(0.007)	(0.007)	(0.009)	(0.009)	(0.009)	(0.014)	(0.011)
Fin. Lit.	-0.000	-0.000	-0.001	-0.030***	-0.030***	-0.030***	0.002	-0.032**
	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)	(0.008)	(0.016)	(0.016)
Log income	0.024***	0.024***	0.025***	-0.044***	-0.044***	-0.045***	-0.033	-0.050**
	(0.009)	(0.009)	(0.009)	(0.014)	(0.014)	(0.015)	(0.020)	(0.019)
Age	0.075***	0.075***	0.075***	-0.123***	-0.122***	-0.123***	-0.134***	-0.113***
	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.011)	(0.009)
Female	0.021	0.021	0.020	0.032*	0.032*	0.029	-0.011	0.039*
	(0.014)	(0.014)	(0.015)	(0.018)	(0.018)	(0.018)	(0.031)	(0.022)
Urban	-0.010*	-0.010*	-0.010*	0.001	0.001	0.001	0.010	-0.002
	(0.005)	(0.005)	(0.006)	(0.007)	(0.007)	(0.007)	(0.012)	(0.008)
Green party	0.560**	0.565**	0.544**	1.091***	1.092***	1.085***	0.694	1.249***
	(0.276)	(0.276)	(0.276)	(0.351)	(0.351)	(0.351)	(0.632)	(0.420)
University	-0.008	-0.007	-0.009	0.004	0.004	0.004	0.064**	-0.022
	(0.015)	(0.015)	(0.015)	(0.019)	(0.019)	(0.019)	(0.031)	(0.023)
Env./Bio. student	0.022	0.022	0.021	0.044	0.040	0.043		0.011
	(0.054)	(0.054)	(0.054)	(0.062)	(0.062)	(0.062)		(0.069)
Bus./Econ. student	-0.001	-0.002	-0.001	-0.053*	-0.054*	-0.053*	-0.022	-0.060*
	(0.023)	(0.023)	(0.023)	(0.029)	(0.029)	(0.029)	(0.055)	(0.033)
Sample	PPA	PPA	PPA	PPA	PPA	PPA	Low Fin Lit	High Fin Lit
Observations	3,667	3,667	3,667	3,667	3,667	3,667	1,228	2,439
Pseudo -R^2	0.048	0.048	0.047	0.086	0.087	0.086	0.108	0.072

Table V: Green Beliefs and Green Pension Choices

This table presents the results of Probit and OLS regressions where the dependent variable equals one for respondents that at some point made an active choice to opt out of the default fund (Active choice) in Columns (1) through (3), and zero otherwise. The dependent variable in Columns (4) through (7) is weight in ESG-labeled funds (ESG-Labeled), and in Columns (8) through (10) the weight in funds with names suggesting that the fund is devoted to sustainable investments (ESG-Named). Column (7) displays the results for the 1,738 respondents of active choice investors that answered the "Big 3" financial literacy questions correctly. Independent variables and characteristics follow those in Table IV. Fund controls include fund categories and fees. The survey data is matched to 3,667 accounts obtained from the Premium Pension Agency (PPA). The table reports marginal probabilities. Robust standard errors within parenthesis where *, ** and *** denote significance at the 10%, 5% and 1% level.

VARIABLES	Active Choice			ESG-Labeled				ESG-Named		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Clean planet	-0.066***	-0.050**		-0.000	-0.015			0.012**	0.010	
	(0.020)	(0.021)		(0.017)	(0.019)			(0.006)	(0.006)	
Higher cost		-0.048			0.031				0.017	
		(0.031)			(0.031)				(0.011)	
Higher return		-0.022			0.036				-0.001	
		(0.026)			(0.024)				(0.008)	
Green preferences			-0.022*			0.015	0.024**			0.009***
			(0.011)			(0.010)	(0.012)			(0.003)
Env. Lit.	-0.002	-0.002	-0.003	-0.005	-0.005	-0.005	-0.007	0.001	0.001	0.001
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.002)	(0.002)	(0.002)
Fin. Lit.	0.033***	0.033***	0.033***	-0.006	-0.006	-0.007	0.001	0.003*	0.003*	0.003*
	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.013)	(0.002)	(0.002)	(0.002)
Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund controls	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	PPA	PPA	PPA	Active	Active	Active	High Lit.	Active	Active	Active
Observations	3,667	3,667	3,667	2,474	2,474	2,474	1,738	2,474	2,474	2,474
Pseudo-R^2	0.236	0.237	0.235	0.219	0.220	0.220	0.228	0.029	0.030	0.030

Table VI: Green Values and Direct Stock Ownership

This table presents the results of Probit regressions estimated on the full sample where the dependent variable equals one for respondents owning stocks in Columns (1) through (3) and zero otherwise. The dependent variable in Columns (4) through (6) is an indicator variables taking the value of one if the investor holds energy stocks and zero otherwise conditional on owning stocks. No students of environmental science hold energy stocks, so this variable is dropped from the regressions. Columns (7) through (9) reports OLS regressions where the dependent variable is the combined CO_2-emission implied by the portfolio as measured by its industry composition. Independent variables follow those in Table IV and V. Data for Swedish stock holdings have been obtained from Euroclear, and industry carbon emissions from Statistics Sweden. Pseudo R-squared is reported in Columns (1) through (6). The table reports marginal probabilities. Robust standard errors within parenthesis where *, ** and *** denote significance at the 10%, 5% and 1% level.

VARIABLES	Stock			Energy			CO_2		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Clean planet	-0.028*	-0.021		-0.017	-0.035**		-0.006	0.000	
	(0.015)	(0.017)		(0.017)	(0.017)		(0.034)	(0.038)	
Higher cost		0.008			-0.006			-0.059	
		(0.025)			(0.030)			(0.056)	
Higher return		-0.031			0.093**			0.024	
		(0.020)			(0.045)			(0.050)	
Green preferences			-0.026***			-0.003			-0.003
			(0.009)			(0.010)			(0.018)
Env. Lit.	0.001	0.001	0.001	0.010	0.010	0.010	-0.004	-0.005	-0.004
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.015)	(0.015)	(0.015)
Fin. Lit.	0.061***	0.061***	0.061***	0.002	0.003	0.002	0.030**	0.029**	0.030**
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.014)	(0.014)	(0.014)
Log income	0.086***	0.085***	0.086***	-0.009	-0.007	-0.008	-0.024	-0.023	-0.024
	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)	(0.023)	(0.023)	(0.023)
Age	0.031***	0.031***	0.031***	-0.012*	-0.011*	-0.012*	-0.016	-0.017	-0.016
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.012)	(0.012)	(0.012)
Female	-0.085***	-0.085***	-0.080***	-0.037**	-0.037**	-0.038**	0.008	0.008	0.009
	(0.014)	(0.014)	(0.014)	(0.015)	(0.015)	(0.015)	(0.030)	(0.030)	(0.031)
Urban	0.006	0.006	0.005	0.005	0.004	0.005	0.002	0.002	0.002
	(0.005)	(0.005)	(0.005)	(0.007)	(0.007)	(0.007)	(0.012)	(0.012)	(0.012)
Green party	0.056	0.042	0.069	-0.065	-0.013	-0.066	0.189	0.248	0.191
	(0.272)	(0.272)	(0.272)	(0.318)	(0.314)	(0.321)	(0.592)	(0.595)	(0.593)
University	0.034**	0.033**	0.034**	-0.015	-0.011	-0.015	-0.035	-0.033	-0.036
	(0.014)	(0.014)	(0.014)	(0.017)	(0.017)	(0.017)	(0.032)	(0.032)	(0.032)
Env./Bio. student	-0.023	-0.022	-0.022				0.156	0.156	0.156
	(0.047)	(0.047)	(0.047)				(0.105)	(0.106)	(0.105)
Bus./Econ. student	0.039*	0.039*	0.038*	0.033	0.033	0.033	0.004	0.006	0.004
	(0.023)	(0.023)	(0.023)	(0.030)	(0.029)	(0.030)	(0.043)	(0.043)	(0.043)
Sample	All	All	All	Stock	Stock	Stock	Stock	Stock	Stock
Observations	3,993	3,993	3,993	976	976	976	976	976	976
Pseudo-R^2	0.094	0.095	0.096	0.034	0.049	0.032	0.011	0.013	0.011

Table VII: Environmental Values and Green Engagement

This table presents the results of Probit regressions where the dependent variable equals one for the response is "Strongly agree" to the questions "I am willing to pay more for environmentally friendly products" (Green products) in Columns (1) through (3); "I recycle a great deal more than my neighbors" (Recycle much more) in Columns (4) through (6); and if the response is "Never" to the question "How often do you check your pension saving account(s)?" ("Never checks pension") in Columns (7) through (9). In columns (10) through (12) the dependent variable is a dummy for strongly agreeing to "I find environmental matters interesting," while in columns (13) through (15) the dummy corresponds to strongly agreeing to the statement "I find financial matters interesting." The dependent variables take the value of zero otherwise. Independent variables and characteristics follow those in Table IV, V and VII. The table reports marginal probabilities. Robust standard errors within parenthesis where *, ** and *** denote significance at the 10%, 5% and 1% level.

VARIABLES	Green products			Recycle much more			Never checks pension			Environmental interest			Financial interest		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Clean planet	0.415***	0.294***		0.101***	0.062***		0.048***	0.040**		0.405***	0.296***		0.030*	-0.005	
	(0.017)	(0.020)		(0.015)	(0.015)		(0.017)	(0.018)		(0.017)	(0.020)		(0.016)	(0.017)	
Higher cost		0.403***			0.068***			0.035			0.253***			-0.013	
		(0.034)			(0.023)			(0.026)			(0.035)			(0.024)	
Higher return		0.311***			0.077***			-0.000			0.371***			0.144***	
		(0.027)			(0.019)			(0.021)			(0.026)			(0.024)	
Green preferences			0.308***			0.049***			-0.009			0.311***			0.006
			(0.012)			(0.008)			(0.010)			(0.013)			(0.009)
Env. Lit.	0.012	0.012	0.014*	0.014**	0.013**	0.015***	0.005	0.004	0.006	0.023***	0.023***	0.026***	-0.007	-0.007	-0.006
	(0.007)	(0.008)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)
Fin. Lit.	0.027***	0.029***	0.024***	-0.004	-0.004	-0.004	-0.029***	-0.029***	-0.028***	0.029***	0.032***	0.025***	0.051***	0.052***	0.051***
	(0.007)	(0.007)	(0.007)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)	(0.008)	(0.007)	(0.006)	(0.006)	(0.006)
Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993	3,993
Pseudo R^2	0.161	0.240	0.223	0.0298	0.0403	0.0259	0.0766	0.0770	0.0750	0.130	0.189	0.176	0.0466	0.0575	0.0458

A Sampling

This Appendix presents the data collection and matching procedure in detail. In early 2018, Statistics Sweden (SCB) mailed out 19,977 invitations to a random sample of Swedes aged 18-65. The invitation contained information about the purpose of the survey, how to log on to the response website at SCB, what registry data that was going to be used and matched to the survey responses if the respondent agreed to participate, and contact details to SCB and one of the authors in case of questions. Respondents were not offered compensation for their participation.

In the next step, SCB collected and matched individual pension data and stock holdings to the survey which was supplied by the Premium Pension Agency (PPA) and from Euroclear Sweden. All identities are scrambled, and the analysis was conducted through the mainframe computer situated at the SCB from which the authors only can retrieve and keep the SCB aggregated results and not the data itself.

The procedure followed all standards applied by SCB and the project has been approved by the Swedish Ethical Review Authority. SCB calibrated the sample to an underlying population of 6,097,316 Swedes in the ages 18-65 using gender, age, country of birth, income, highest level of education, marital status and history of citizenship (details of the mailer, population weighting procedure and protocol over the data collection is available from the authors upon request).

Table A.1 summarizes this information, where Panel A gives details about the data collection and Panel B dislplays the matching procedure.

Table A.1: Sample selection
This table display details of the sample construction. Panel A displays details about the survey invitation and responses, and Panel B displays details of the matching procedure and deletions due to missing data.

Panel A:	Survey invitations			
Note	Responses	% of Total		Date
First invitation	1,795	9.0		February 7, 2018
Reminder 1	1,545	7.7		February 22, 2018
Reminder 2	917	4.6		March 13, 2018
Total responses	4,257	21.3		
No response	14,819	74.2		
Returned mail	281	1.4		
Declined	557	2.8		
Not found	63	0.3		
Total invites	19,977	100.0		

Panel B:	Matching			
Note	Responses	% of Total	Deletions	Remark
Total responses	4,257	21.3	0	Initial sample
Deletion 1	4,174	20.9	83	Missing SCB registry data
Deletion 2	3,993	20.0	181	Incomplete responses
Deletion 2	3,667	18.4	326	Missing PPA data

B Measuring Financial and Environmental Literacy

We use a version of the standard financial literacy test developed by Lusardi and Mitchell (2007) adapted to the Swedish retirement savings context by Anderson and Robinson (2018). The test uses the questions used in the National Financial Capability Study in the US, but we replace the question about mortgages with a question about long-term savings and the required rate of return for doubling the value of an investment over ten years because residential mortgages operate differently in Sweden. The first three financial literacy questions are direct translations from those of the NFCS, and we refer to them as the "Big-3," in keeping with the literature. Table I shows that, on average, respondents got 3.14 questions correct. This is in line with many other studies using these survey questions. When we apply survey weights to correct for underrepresentation of younger, lower-income respondents, this number drops to 2.93. Average scores broken out by demographic categories are tabulated in Table I. Univariate comparisons indicate that men score higher than women, and that younger, less affluent and less educated households living in rural areas have lower scores. These results coincide with the previous literature, where Swedes also score higher on the test compared to many other nationalities (see, for instance, Hastings, Madrian, and Skimmyhorn (2013) and Lusardi and Mitchell (2011)).

Table B.1 here

To measure environmental literacy in a similar manner, we develop a five-question test intended to capture knowledge of household-related matters that connect to the environment. The test is designed to offer some simple questions that most individuals would be expected to know, but to also offer some more challenging questions that require a more subtle understanding of environmental processes.

Table B.2 here

Two questions focus on energy, three focus on biological and environmental phenomena. Table B.2 summarizes the test. Correct answers are underlined, and response tallies are provided in parentheses. The first question gauges knowledge about the tradeoffs surrounding the use of regular versus low energy consumption lightbulbs, "A low energy lightbulb costs more than a regular lightbulb but uses less energy. About how long does one last?" Compact-fluorescent (CFL) bulbs last about 10-times longer than standard incandescent bulbs, whereas led light bulbs last as much as 25 times longer. Most respondents get the correct answer (42.5%) but almost as many respondents (41.6%) think that low energy bulbs last 100 times longer.[9]

To test for basic knowledge around one of the key culprits behind global warming, we asked respondents about the purpose of the ozone layer: "The ozone layer filters what harmful product?" Almost all respondents (86%) replied with the correct answer ("UV radiation"), but almost 7% claimed to not know the answer.

The third question measures knowledge about food loss and food waste in the global food supply chain: "According to the UN, around 30% of the world's food production is lost each year. When does this loss occur?" The data behind this question come from

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[9]This answer is especially puzzling in light of Allcott and Taubinsky (2015) who show that only 28 percent of residential sockets in the US hold CFL's in 2010, making consumers lose as much as $15 billion in potential energy savings.

the United Nations Food and Agriculture Organization (FAO). Over 62% of respondents incorrectly believe that most food loss occurs at home, after food is purchased from the grocery store. Although the amount of food is lost in the developed world in this manner is large relative to the supply of food in the developing world, much more food is lost earlier in the supply chain. In the developing world, the majority of food loss occurs because of inefficiencies in harvesting, storage and transportation, whereas in the developed world, transportation systems are more efficient but large amounts of food waste occurs because cosmetically unappealing, but otherwise perfectly healthy, produce is discarded before it reaches the supermarket. Based on calculations presented in Gustavsson, Cederberg, and Sonesson (2011), the correct answer is "Most food is lost before it reaches the supermarket," but only 11% of respondents answer accordingly. Around 18% report that it occurs at the grocery store before the produce is sold and over 62% incorrectly thinks that most food is lost at home. In fact, food loss and waste at the consumer level is much lower compared to earlier stages in the supply chain even in the developed world.

An inter-connected question relates to global expenditures on heating and cooling: "Does the world spend more energy on heating homes or cooling them?" In Sweden, as in much of Northern Europe, home air-conditioning systems are relatively uncommon, whereas heating is ubiquitous. The correct answer reflects two forces in tension. On the one hand, many more people in the world live in warmer places than in cooler places, which militates toward cooling being a larger energy sink than heating. But on the other hand, air-conditioning is not widely available in these parts of the world. According to the US Energy Information Administration (IEA), more energy is spent on heating than cooling, but this relation is expected to change going forward where demand for cooling to grow 33-fold to 10,000 terawatt hours (TWh) by year 2100—equivalent to roughly half of the total electricity generated worldwide in 2010.[10] Most respondents answered that cooling was a bigger use of energy (39.9%), while only around 28% respond correctly.

One consequence of global warming that has received attention in the media is the displacement of arctic animals like polar bears from their natural habitats. Our final question is intended to capture a basic awareness of this process: "Why don't polar bears eat penguins?" Penguins are native to the Southern Hemisphere, while polar bears are native to the Arctic region, which makes "None of the above" the correct answer. More than half (58%) of respondents answer correctly, but a quarter report that they do not know. Over ten percent of respondents indicate that polar bears do not eat penguins because they have both been driven from their natural habitats, and just above two percent believe that Polar bears are vegetarians.

Table I shows that the average score on this test was 2.27. The raw correlation between the two test scores is around 18%. Measuring this correlation allows us to contrast between two hypotheses. One is that individuals who have knowledge in one domain have knowledge in many domains because knowledge comes easily to them. Under that hypothesis, the two measures would be positively correlated, and environmentally informed views would naturally be expressed in market prices because the environmentally informed would also be financially engaged. The alternative hypothesis is that through virtue-signaling channel, or simply through selective engagement, individuals specialize in certain types of knowledge, eschewing others. Contrasting these hypothe-

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[10]This phenomenon is also reported in an article published in the Guardian "World set to use more energy for cooling than heating", October 26, 2015. See Labriet et. al. (2015) for examples of assumptions and projections.

ses is useful for understanding whether individuals with high degree of environmental knowledge are likely to express their environmental preferences through their portfolio choice decisions. To explore this further, we provide conditional correlations in the form of regressions in the Appendix in Table B.3. The appendix table shows a low correlation between environmental and financial literacy, and becomes also much weaker when conditioning the sample on having strong pro-environmental views. In addition, there is a very strong correlation between financial literacy and reporting a strong interest in personal financial matters. The correlation with financial interest and environmental literacy is virtually zero. This supports the idea that environmental and financial knowledge have little overlap, and particularly the low overlap between green value orientations and financial knowledge and interest.

Table B.3 shows that the correlation between environmental literacy and financial literacy is low. Column (1) shows that the loadings on demographic characteristics for the financial literacy test confirm what is found in many other studies (see Hastings, Madrian, and Skimmyhorn (2013)). Higher income older males with university education score higher on this test. In Column (2) we repeat the regression but only on the sub-sample of "clean planet" respondents–those who strongly agree to the statement that a clean planet is more important than financial welfare. The main difference in the columns is that the positive correlation with income is weaker, as is the positive correlation with having studied business or economics. Both owe to the fact that there are fewer individuals with these characteristics in the environmental values subsample.

Table B.3 here

Column (3) of Table B.3 shows that the score of the environmental literacy test is not well explained with demographic variables. Respondents who studied biology or environmental science at university score higher on the environmental literacy test, suggesting that the test questions are well understood by those who have studied a formal curriculum in this area. That correlation is much stronger in Column (4) when we focus on the subsample of people with pro-environmental values as measured by the clean planet statement. Columns (5) and (6) of Table B.3 explores the conditional correlation between the two tests which is around 18%, and when the correlation is conditioned on those holding strong pro-social values, it drops to a mere 10%. This shows that the relation between environmental and financial literacy is low, particularly for the environmentally engaged.

Finally, Column (7) and (8) of Table B.3 shows the relation between test scores and interest in the financial and environmental domain in Probit regressions where the dependent variable takes the value of one if strongly agreeing to the statements "I find / personal financial matters / environmental issues / interesting", and zero otherwise. The results show that there is a strong relation between higher financial literacy scores and environmental interest, but no relation between environmental literacy and financial interest, which further supports the previous finding of low overlap between environmental and financial engagement.

Table B.4 presents the results from Probit regressions on environmental attitudes measured by strongly agreeing to the three statements "A clean planet is more important to me than financial welfare" (Clean planet); "Environmentally sustainable investments generate higher returns in the long run" (High returns); and "It is worth paying higher fees for a mutual fund that only make environmentally sustainable investments" (High cost), all zero otherwise.

Columns (1) through (3) of Table B.4 shows that those valuing a clean planet over financial welfare are younger, have higher education and income and more likely to be female rather than male. These views are more likely to be held by people living in Green party dominated areas, but this effect washes out when controlling for environmental literacy in Column (3), which also adds to the explanatory power of the regression. The three measures are indeed highly correlated. Views about a clean planet is strongly related to both thinking that green investments outperform others in Column (4) and and a willingness to pay higher fees for green mutual funds in Column (5). The point estimates reveal that those valuing a clean planet are 27% and 19% more likely to agreeing to the other two statements. Column (6) shows that the willingness to pay higher fees is not explained solely by thinking returns are higher - a green pro-social value orientation is strongly related to the willingness to pay higher fees for environmentally sustainable funds. This shows that preferences for green investments is a mix of both pecuniary and non-pecuniary motives.

Table B.1: Five modified financial literacy questions

This table presents the five ("Big-5") financial literacy questions (the first three are referred to as the "Big-3" in the main text) used in the study and corresponding frequency responses on each item. Correct answers are highlighted in boldface. The questions have been translated from Swedish into English. There are 3,993 observations.

1. *Compounding*. Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? Please select one.

   (a) **More than $102 (3,633, 91.0%)**
   (b) Exactly $102 (68, 1.7%)
   (c) Less than $102 (109, 2.7%)
   (d) Don't know (136, 3.4%)
   (e) Prefer not to say (47, 1.2%)

2. *Inflation*. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? Please select one.

   (a) More than today (199, 5.0%)
   (b) **Less than today (3,065, 76.8%)**
   (c) Exactly the same as today (146, 3.7%)
   (d) Don't know (516, 12.9%)
   (e) Prefer not to say (67, 1.7%)

3. *Diversification*. Buying a single company's stock usually provides a safer return than a stock mutual fund. Please select one.

   (a) True (225, 5.6%)
   (b) **False (3,261, 81.7%)**
   (c) Don't know (458, 11.5%)
   (d) Prefer not to say (49, 1.2%)

4. *Long-Term Savings*. Suppose you were given $10,000 as a gift and wanted to double the amount by saving the money ten years without having to touch it. What interest rate would you require to achieve this goal? Please select one.

   (a) About 15% annual interest rate (254, 6.4%)
   (b) About 10% annual interest rate (1,552, 38.9%)
   (c) **About 7% annual interest rate (1,764, 44.2%)**
   (d) Don't know (353, 8.8%)
   (e) Prefer not to say (70, 1.8%)

5. *Bond Pricing*. If interest rates fall, what should happen to bond prices? Please select one.

   (a) **They will rise (676, 16.9%)**
   (b) They will fall (818, 20.5%)
   (c) They will stay the same (1,680, 42.1%)
   (d) Don't know (752, 18.8%)
   (e) Prefer not to say (67, 1.7%)

Table B.2: Measuring Environmental Literacy

This table reports the questions and responses of the environmental literacy test where correct choices are underlined. The questions have been translated from Swedish into English. There are 3,933 individuals in the sample.

1. A low-energy (CFL or LED) lightbulb costs more than a regular lightbulb but uses less energy. About how long does one last?

    (a) About the same as a regular lightbulb (67, 1.7%)
    (b) About 10 times as long as a regular lightbulb (1,709, 42.8%)
    (c) About 100 times as long as a regular lightbulb (1,662, 41.6%)
    (d) Don't know/Prefer not to say (555, 14.9%)

2. The ozone layer filters what harmful substance?

    (a) Acid rain (25, 0.6%)
    (b) UV radiation (3,466, 86.8%)
    (c) Sewage gas (57, 1.4%)
    (d) The Greenhouse Effect (187, 4.7%)
    (e) Don't know/Prefer not to say (258, 6.5%)

3. According to the UN, around 30% of the world's food is lost each year. When does this loss occur?

    (a) Most food is lost before it reaches the supermarket (445, 11.1%)
    (b) Most food is discarded at the supermarket before it is sold (722, 18.1%)
    (c) Most food is wasted after it is purchased from the supermarket (2,486, 62.3%)
    (d) Don't know/Prefer not to say (340, 8.5%)

4. Does the world spend more energy on heating homes or cooling them?

    (a) More energy on heating (1,109, 27.8%)
    (b) More energy on cooling (1,610, 40.3%)
    (c) About the same amount on both (559, 14.0%)
    (d) Don't know / Prefer not to say (715, 17.9%)

5. Why don't polar bears eat penguins?

    (a) They have both been driven out of their natural environment (457, 11.4%)
    (b) Polar bears do not eat meat (83, 2.1%)
    (c) Penguins are only active when polar bears hibernate (133, 3.3%)
    (d) None of the above (2,339, 58.6%)
    (e) Don't know/Prefer not to say (981, 24.6%)

Table B.3: The Demographics of Financial and Environmental Literacy Scores

This table reports results from OLS regressions where the dependent variable is the score of the financial literacy test in Columns (1) and (2), and environmental literacy tests in Columns (3) through (6), both ranging from zero to five. The dependent variable in Columns (7) and (8) takes the value of one for those strongly agreeing to the two statements "I find personal financial matters / environmental issues / interesting". Independent variables include log of disposable income and age which is scaled and divided by ten. Urban and Green Party measures the population density and share of Green Party votes within the municipality of the respondent. Female, University, Env./Bio and Bus./Eco. student are indicator variables for females, subjects having at least completed on course at the university-level or having studied Economics/Business or Biology/Geography/Environmental science at any level since high school. There are 3,993 in the full sample (labeled "All"), and 1,015 in the subsample of respondents who strongly prioritize a clean planet over financial welfare (labeled "CP: Clean planet"). Robust standard errors within parenthesis where *, ** and *** denote significance at the 10%, 5% and 1% level.

| VARIABLES | Literacy | | | | | | Interest | |
| | Financial | | Environmental | | | | Fin. | Env. |
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fin. Lit.					0.175***	0.104***	0.049***	0.026***
					(0.015)	(0.029)	(0.006)	(0.007)
Env. Lit.							-0.006	0.031***
							(0.006)	(0.007)
Log income	0.097***	0.054***	0.025*	0.002	0.008	-0.004	0.000	-0.019***
	(0.015)	(0.019)	(0.014)	(0.021)	(0.014)	(0.022)	(0.005)	(0.006)
Age	0.062***	0.037	-0.032**	-0.036	-0.043***	-0.040	0.005	-0.000
	(0.014)	(0.027)	(0.012)	(0.025)	(0.012)	(0.024)	(0.005)	(0.005)
Female	-0.659***	-0.668***	-0.115***	-0.081	-0.000	-0.012	-0.084***	0.052***
	(0.035)	(0.068)	(0.032)	(0.061)	(0.033)	(0.064)	(0.013)	(0.015)
Urban	0.015	-0.005	-0.014	-0.033	-0.016	-0.033	0.000	0.013**
	(0.014)	(0.027)	(0.013)	(0.025)	(0.013)	(0.025)	(0.005)	(0.006)
Green party	1.678**	1.872	1.332**	0.843	1.039	0.648	0.071	0.318
	(0.695)	(1.304)	(0.653)	(1.199)	(0.646)	(1.196)	(0.263)	(0.303)
University	0.689***	0.638***	0.160***	0.063	0.039	-0.003	0.009	0.075***
	(0.037)	(0.076)	(0.033)	(0.065)	(0.034)	(0.067)	(0.014)	(0.016)
Env./Bio. student	0.199*	0.200	0.282***	0.346**	0.247**	0.325**	-0.119***	0.233***
	(0.108)	(0.176)	(0.107)	(0.149)	(0.103)	(0.147)	(0.038)	(0.058)
Bus./Econ. student	0.455***	0.399***	-0.095*	-0.151	-0.175***	-0.193	0.092***	-0.021
	(0.055)	(0.116)	(0.052)	(0.123)	(0.052)	(0.122)	(0.024)	(0.025)
Constant	1.308***	2.136***	2.022***	2.644***	1.793***	2.423***	0.075	0.287***
	(0.203)	(0.285)	(0.189)	(0.308)	(0.188)	(0.317)	(0.068)	(0.080)
Sample	All	CP	All	CP	All	CP	All	All
Observations	3,993	1,015	3,993	1,015	3,993	1,015	3,993	3,993
R-squared	0.183	0.169	0.017	0.013	0.053	0.026	0.047	0.041

Table B.4: The Correlation in Environmental Attitudes

This table presents the results of a Probit regression where the dependent variable equals one if the answers are "Strongly agree" to the statements "A clean planet is more important to me than financial welfare" (Clean planet) reported in Columns (1) through (3); "Green investments generate higher returns in the long run" ("Higher return") reported in Column (4) and "I am willing to pay higher fees for mutual funds that only make sustainable investments" ("Higher cost") in Columns (5) and (6)); all zero otherwise. Independent variables follow those in Table B.3. The table reports marginal probabilities. Robust standard errors within parenthesis where *, ** and *** denote significance at the 10%, 5% and 1% level.

VARIABLES	Clean planet			Higher return	Higher cost	
	(1)	(2)	(3)	(4)	(5)	(6)
Higher return						0.089***
						(0.016)
Clean planet				0.270***	0.189***	0.149***
				(0.016)	(0.014)	(0.014)
Env. Lit.			0.029***	0.003	0.001	0.001
			(0.007)	(0.005)	(0.004)	(0.004)
Fin. Lit.		0.008	0.003	0.000	0.000	0.001
		(0.006)	(0.006)	(0.005)	(0.004)	(0.003)
Log income	-0.022***	-0.023***	-0.023***	-0.009***	-0.002	-0.001
	(0.005)	(0.005)	(0.005)	(0.004)	(0.002)	(0.002)
Age	0.008	0.008	0.009*	-0.011***	-0.009***	-0.009***
	(0.005)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)
Female	0.049***	0.054***	0.054***	0.010	0.003	0.003
	(0.014)	(0.014)	(0.014)	(0.011)	(0.008)	(0.008)
Urban	0.006	0.006	0.006	0.004	0.001	0.000
	(0.006)	(0.006)	(0.006)	(0.004)	(0.003)	(0.003)
Green party	0.467*	0.454	0.426	-0.191	0.246*	0.274*
	(0.284)	(0.284)	(0.284)	(0.201)	(0.144)	(0.140)
University	0.075***	0.070***	0.069***	-0.018	0.030***	0.031***
	(0.014)	(0.015)	(0.015)	(0.011)	(0.008)	(0.008)
Env./Bio. student	0.044	0.043	0.034	0.032	0.029	0.025
	(0.055)	(0.054)	(0.054)	(0.043)	(0.031)	(0.030)
Bus./Econ. student	-0.026	-0.030	-0.025	0.011	0.008	0.005
	(0.023)	(0.023)	(0.023)	(0.018)	(0.014)	(0.013)
Observations	3,993	3,993	3,993	3,993	3,993	3,993
Pseudo R-squared	0.022	0.022	0.026	0.134	0.153	0.175

C List of variables

This Appendix contains a brief variable description of the variables used in the analysis.

Table C.1: Variable definitions

This table presents a short description of all key variables grouped into those collected from the survey (Survey), matched to the Statistics Sweden registry (Characteristics) and matched to the Premium Pension Authority on pensions and Euroclear individual stock holdings (Decisions). Dummy variables takes the value of one as described and zero otherwise. Variables within each group are sorted as they appear in the main text.

1. Survey variables

   - *Clean planet* Dummy variable for strongly agreeing to the statement "A clean planet is more important for me than financial welfare".

   - *Higher cost* Dummy variable for strongly agreeing to the statement "It is worth paying higher fees for a mutual fund that only make environmentally sustainable investments".

   - *Higher return* Dummy variable for strongly agreeing to the statement "Environmentally sustainable investments generate higher returns in the long run".

   - *Green preferences* The average score across the three statements Clean planet, Higher cost and Higher return grading the responses on a five point scale from -2 (Strongly disagree) to 2 (Strongly agree).

   - *Financial interest* Dummy variable for strongly agreeing to the statement "I find personal financial matters interesting".

   - *Environmental interest* Dummy variable for strongly agreeing to the statement "I find environmental matters interesting" .

   - *Green products* Dummy variable for strongly agreeing to the statement "I am willing to pay more for environmental friendly products".

   - *Recycle much more* Dummy variable if responding "I recycle a great deal more than my neighbors".

   - *Never checks pension* Dummy variable if the response is "Never" to the question "How often do you review your retirement savings?".

2. Characteristics

   - *Female* Dummy variable for females.

   - *Log income* The natural log of disposable income.

   - *University* Dummy variable for post high school education.

   - *Studied Env / Bio* Dummy variable for post high school education in biology/geography/natural science.

   - *Studied Econ / Bus* Dummy variable for post high school education in economics or business.

   - *Urban* Population density measured at the municipality level (290 areas).

   - *Green party* Election outcome of the Swedish Green Party (Miljöpartiet) measured at the municipality level in 2014.

3. Decisions

   - *Active choice* Dummy variable if the respondent ever made an active choice in the Swedish Premium pension system and zero otherwise.

   - *ESG-Labeled* The portfolio weight in ESG-labeled funds in the Swedish premium pension system.

   - *ESG-Named* The portfolio weight in funds with names containing the Swedish-language or English-language words for SRI, ESG, water, sustainable, environmental, ethical, earth, clean or green.

   - *Energy* Dummy variable if the portfolio holds any position in the Energy sector according to the two-digit Swedish industry SNI code standard.

   - CO_2 The portfolio's industry carbon dioxide emission implied by the Scope 1 industry SNI classification from Statistics Sweden.

   - *Stock* Dummy variable if the respondent holds individual stocks.