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Measuring sustainability preferences of pension members

A methodological proposition and a case study of a UK pension fund

Rob Bauer, Marco Ceccarelli, Katrin Gödker, and Paul Smeets

DESIGN PAPER 228

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Affiliations

Rob Bauer – Maastricht University
Marco Ceccarelli – Maastricht University
Katrin Gödker – Bocconi University
Paul Smeets – University of Amsterdam

Abstract

In this report, we propose an approach to measure people's true preferences for sustain- able investing. We present an investment game with implications for participants in the real world, implemented with a survey-in-the-field experiment. This approach helps to mitigate concerns about a hypothetical bias that are common in surveys of stated (or reported) preferences. We next provide evidence from this experiment with the clients of a large pension fund in the UK and find a strong consistency between the underlying preferences in the investment game and stated preferences in the survey. Moreover, the observed preferences are robust to changes in context. When introducing a commonly used default option that could potentially shift people's behavior, we do not find any effect on their choice. Understanding how to measure preferences for sus- tainable investing is particularly useful for Dutch pension fund decision-makers. Many of these funds have signed the Responsible Business Conduct Agreement on respon- sible investment (2018). In this agreement, pension funds pledge to identify their members' preferences and priorities regarding sustainability. Funds responded by executing surveys and other instruments, many of which were prone to several biases that the survey literature has documented well. Our paper provides Dutch pension funds with an additional instrument to elicit sustainability preferences.

Executive summary

There is an increasing need for asset managers such as pension funds to measure the preferences of their clients. Traditionally, the focus of policymakers has been on risk preferences (Alserda et al.,2019). However, this focus might soon be extended to preferences for sustainable investing (Bauer and Smeets, 2021). We argue that measuring sustainable preference is not simple. In particular, naïve use of surveys could fail to elicit the true preferences of respondents. We propose using an incentivized investment game to measure the true preferences for sustainable investment and show how these compare with the use of simple survey questions. We provide support for our measure by testing it with clients of a UK pension fund. In this context, there is a strong consistency between the preferences for sustainable investing as measured with survey questions and those measured in the investment game. While we test the approach in the UK, our setting is also applicable to the Dutch context, as well as to the US or other European countries. Our approach will become particularly useful when pension funds need to measure their clients' preferences regarding sustainability in addition those regarding risk.

Nederlandse samenvatting

Er is een groeiende behoefte bij pensioenfondsen om de voorkeuren te meten van hun deelnemers. Traditioneel ligt de focus van beleidsmakers op risicovoorkeuren (Alserda et al., 2019). Dit zou echter binnenkort uitgebreid kunnen worden naar duurzaamheidsvoorkeuren (Bauer en Smeets, 2021). Wij stellen dat het correct meten van voorkeuren m.b.t. duur- zaamheid niet eenvoudig is. Enquêtes onder deelnemers kunnen vanwege verschillende biases (bijvoorbeeld sociale wenselijkheid) falen bij het in kaart brengen van de werkelijke voorkeuren van respondenten. Wij introduceren een beleggingsspel om de voorkeur voor duurzaam beleggen van deelnemers te meten en wij laten zien hoe dit zich verhoudt tot het gebruik van eenvoudige vragen in een enquête. Wij testen onze maatstaf met klanten van een Brits pensioenfonds. Wij vinden een hoge mate van consistentie tussen de voorkeuren voor duurzaam beleggen gemeten via een enquêtevraag en gemeten via het beleggingsspel. Hoewel wij de aanpak testen in het Verenigd Koninkrijk is onze opzet algemeen toepasbaar in de Nederlandse context, maar ook in de Verenigde Staten en in andere Europese landen. Onze aanpak is bijzonder nuttig wanneer pensioenfondsen naast risicovoorkeuren ook de duurzaamheidsvoorkeuren van hun klanten moeten meten.

1. Introduction

While populations grow older and firms become larger, institutional investors and professional asset managers control an increasing part of the economy by exercising discretion over large amounts of capital. These institutions play an important role in influencing corporate policies. As managers, their duty is to make sure that their firms operate optimally, which traditionally meant achieving maximal profits (Friedman, 1970). In recent decades, this argument has come under renewed scrutiny. In their seminal paper, Hart and Zingales (2017) argue that firms should not exclusively target higher profits but rather focus on shareholder welfare. In other words, companies should set objectives that are aligned with the preferences of their owners. Thus, if the owners of a company have a preference for sustainable business practices, then then company ought to incorporate these.

In practice, this reasoning is complicated by the delegated nature of asset management. The ultimate asset owners typically do not manage their own investments but instead delegate these to professional asset managers.[1] For example, in the Netherlands, employees fund their pensions through defined contributions (DC) and have no say in how their savings are invested.[2] How can asset managers such as pension funds take into account their clients' preferences for sustainability? A simple solution is to elicit these preferences through surveys. The aim of this industry paper is to show how this elicitation can be done.

First, we describe two main pitfalls that arise when measuring preferences: hypothetical bias and exploiting moral wiggle room. Second, we propose a practical solution to these pitfalls that identifies the underlying revealed preferences instead of stated preferences. Finally, we provide an example of how such a measurement can be implemented, on the basis of a case study.

One of the most common forms of measurement is to directly ask clients or investors about their sustainability preferences through surveys. This method elicits the "stated preferences" of respondents. This approach is cheap, simple, and easy to implement. However, survey questions are hypothetical, and people often claim to behave in a certain way, but they seldom back up these claims through actions. The

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1 Often there is an additional delegation layer since many asset managers delegate the actual portfolio composition. See Dasgupta and Maug (2021) for a discussion of why this might be the case.
2 Undoubtedly, this structure has a number of advantages. Asset managers tend to be more skilled than retail investors (Berk and Green, 2004), and delegation can help overcome reservations regarding investing in the stock market (Gennaioli, Shleifer, and Vishny, 2015).

difference between the stated and observed behavior is called the "hypothetical bias" or "hypothetical gap"; it is present in many instances. For example, people often claim to care about animal welfare, but they still buy the cheapest meat (Klink and Langen, 2015).[3]

To overcome the hypothetical bias and to measure actual preferences, a survey needs to meet several conditions. First, it must contain consequential choices (Vossler, Doyon, and Rondeau, 2012) that the surveyor will implement. Second, participants must care about the outcome. Third, the survey must consist of a simple yes or no vote on a single project. Finally, the probability that the proposed project will be implemented must increase with the proportion of yes votes, or, put differently, there must be no reason for respondents to answer the survey strategically (Carson and Groves, 2007).

For example, Bauer, Ruof, and Smeets (2021) ran a survey asking members of a Dutch pension fund whether they agree that their pension fund should increase its commitment to sustainability. Importantly, the pension fund agreed to implement the outcome of the survey. Since their own pensions were at stake, survey participants had enough skin in the game to make sure that their responses reflected their true preferences. Unfortunately, committing to implement the outcome of a survey is often unfeasible in practice since neither the management nor the board wants to delegate important decisions.

A more practical alternative is to elicit the "revealed preferences" of individuals. This is done by using the behavior of subjects in an incentivized task that resembles a real-life scenario. In this case, the hypothetical bias is of less concern given suffi-ciently strong in- centives. The difficulty lies in designing a task that is appropriate to measure the preferences one is interested in.

We propose using an investment game to identify the revealed preferences for sustainable investing. In our design, each participant receives an endowment of £1,000 that is divided between two funds: a sustainable and a conventional one. The sustainable fund is relatively expensive with a fee of 1.5% of the invested amount, while the conventional fund is cheaper with a fee of only 0.5%. The fee structure creates a performance trade-off in sustainable investing (Pástor, Stambaugh, and Taylor, 2021, 2022) as well as the general idea that fees of sustainable funds are higher (Aragon, Jiang, Joenväärä, and Tiu, 2022; Raghunandan and Rajgopal, 2022).

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3   A second disadvantage of running surveys is that, if poorly designed, they can induce so-called "demand effects" (De Quidt, Haushofer, and Roth, 2018). These are instances where the survey design induces a certain behavior from the respondents.

To provide incentives, we implemented the investment decisions of five partici-pants. After six months, these participants received £50 plus or minus the returns of their portfolio, net of fees. This incentive structure has two main advantages. First, the payout is influenced by both gains and losses to make the task more realistic. Second, we actually buy the assets that the participants chose, which means that the responses have real consequences. These consequences increase the stakes of the experiment. The amount invested in the sustainable fund represents the revealed preferences for sustainable investing.

In this design, the participants are asked to make an active investment choice. In real life, this is seldom the case, as they can avoid making such decisions by relying on defaults. This is particularly worrisome in our setting, given the prosocial nature of sustainable investing. Economists have uncovered a series of occasions when people actively avoid a prosocial action. For example, Andreoni, Rao, and Trachtman (2017) placed charity solicitors in front of one of two entrances into a supermarket. They found that people avoid entering through the door with the solicitor because they do not want to feel pressured into giving to charity. This behavior is consistent with the idea that individuals prefer to pursue their self-interest while maintaining the illusion of behaving pro-socially.[4]

In the context of investment decisions, opting for a default is often an alternative to making active decisions. Some people might use the default as an excuse to *not* invest sustainably. We propose a manipulation of the baseline experiment to test if this is an issue in the population of investors.[5] In addition to allocating the £1,000 between the sustainable and conventional funds, participants also had a second option. For an additional fee of merely 0.2%, they could choose a default option, namely to invest the entire endowment in the conventional fund. Importantly, par-ticipants could make the same allocation for a smaller cost to themselves by investing their entire endowment in the conventional fund. However, the default option allows participants to "sneak out" of sustainable investing, as it can be seen as an excuse not to invest sustainably while maintaining the illusion of behaving pro-socially. That

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4   The literature often refers to this phenomenon as "avoiding the ask" or, more generally, as "exploiting moral wiggle room." For more examples, see Adena and Huck (2020); Dana, Cain, and Dawes (2006); Dana, Weber, and Kuang (2007); Exley (2016, 2020); Lazear, Malmendier, and Weber (2012); and Mazar, Amir, and Ariely (2008).

5   It is well-known that defaults have a strong first-order effect in influencing choices, as people often stick to the default option. For example, Madrian and Shea (2001) discuss this in the con-text of 401 (k) pension plans. The presence of this effect is already well-established and outside of the scope of this paper.

is because, by choosing the default option, participants do not *actively* forgo investments in the sustainable fund. We call this the "moral wiggle room" option.

We implemented the investment game with USS, a large UK pension fund serving the employees of the higher education sector, to gauge the strength of the sustainable investing preferences of their clients. First, we found strong revealed preferences for sustainable investing. On average, participants allocated over 70% of their endowment to the sustainable fund. In the second step, we examined which characteristics of participants correlated with this behavior. For example, we found that women invest, on average, £57 more in the sustainable fund compared to men. On the other hand, earning £60k or more correlated with investing £44 less in the sustainable fund. Next, we inves- tigated the correlation between the revealed and stated preferences for sustainability.[6] We found a strong positive association between the two: having a one point higher stated preference correlated with investing £120 more in the sustainable fund.

We next looked at the effect of introducing the moral wiggle room option on allocation of the endowment to sustainable investment. Against our initial hypothesis, we found little evidence that the presence of a cheap conventional default option significantly reduced sustainable investing. Introducing the default reduced investments in the sustainable fund by about £30, which was less than 5% of the unconditional average. There are at least two explanations for this muted effect. First, participants might not see conventional investing as something that is selfish or anti-social and, therefore, might not feel social pressure to choose the more expensive sustainable fund in the first place. They therefore did not need the moral wiggle room option to "sneak out" of the investment task. We leave it for future research to understand what the drivers behind the differences in perceptions might be. Second, it could be that the preferences of investors for sustainable assets are so strong that the trade-off we impose in the form of higher fees is not high enough to make the conventional investment attractive.

The results from our experiment contribute to an extensive literature in economics that examines under what circumstances individuals do (or do not) make use of moral wiggle room to act selfishly or anti-socially while, at the same time, maintaining a positive self-image (Dana et al., 2006, 2007; Exley, 2016, 2020; Lazear et al., 2012). We

6   We measured the latter as the responses, on a scale from 1 to 7, to the following questions: "How much should your pension fund invest sustainably, even if it potentially lowers the pension you get in retirement?" and "How important is it to you that [your pension fund] invests your pension sustainably?"

add to this literature by showing the importance of moral wiggle room for investment choices.

Specifically, our study contributes to the growing literature on sustainable investing. Converging evidence in the finance literature indicates that sustainable investing is motivated largely by reasons other than strictly risk-return maximization (Barber, Morse, and Yasuda, 2021; Bauer et al., 2021; Hartzmark and Sussman, 2019; Riedl and Smeets, 2017; Ceccarelli, Ramelli, and Wagner, 2021). At the same time, a significant share of investors do not invest in a sustainable manner but only hold conventional investments. Our industry paper complements this literature by investigating whether investors use moral wiggle room to avoid sustainable investments.

The remainder of the paper is structured as follows. Section 2 presents the design of the preference measure in more detail. Section 3 presents the results of a survey of clients of a large UK pension fund. Section 4 concludes and discusses alleys for future research.

2. Eliciting preferences for sustainable investing

In this section, we present two methods of eliciting preferences for sustainable investing. Subsection 2.1 presents the design of the investment game and contains an incentivized task through which the underlying preferences can be identified. In subsection 2.2, we briefly discuss how to elicit the stated preferences through simple survey questions.

2.1 The investment game

Participants in the investment game are endowed with £1,000, which they are asked to invest. In the baseline treatment, they need to decide how to split the endowment between two funds: a conventional and a sustainable one. Both funds have a similar profile, as they both are passive ETFs that mimic the MSCI UK Market Fund index. However, one fund is a conventional investment fund, while the other is a sustainable investment fund. The sustainable option integrates environmental, social, and governance (ESG) factors in its asset allocation. Importantly, the costs of the two funds differ. The conventional fund costs 0.5% of the invested sum. The sustainable fund is more expensive, costing 1.5% of the invested sum. We effectively manipulate the fees of the funds to induce a trade-off between sustainable investing and financial performance. This is important because if sustainable investments were free, then everybody would invest in the sustainable fund, and we would not be able to measure participants' preferences without bias. Moreover, such a trade-off is in line with Pástor et al. (2021) and Pástor et al. (2022), who argue that, in equilibrium, the returns of a sustainable investment strategy will be lower as long as the sustainability preferences of investors do not change.[7] Participants can invest any positive amount in the two funds as long as they invest the entire £1,000.

We randomly select five participants and implement their portfolio allocations. Buying the funds is important to ensure that the choices of participants have real consequences and are not merely hypothetical. Participants are paid vouchers worth £50 plus/minus the realized returns of the portfolios. The payout structure means that the investor participates in both gains and losses, making the setting more closely resemble a real-life investment scenario.

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7   This does not hold if sustainability preferences change. In such case, a sustainable investing strategy can outperform conventional investments. As Pástor et al. (2021) put it, "Green assets outperform when positive shocks hit the ESG factor, which captures changes in customers' tastes for green products and investors' tastes for green holdings."

Figure 1: Overview of the investment game
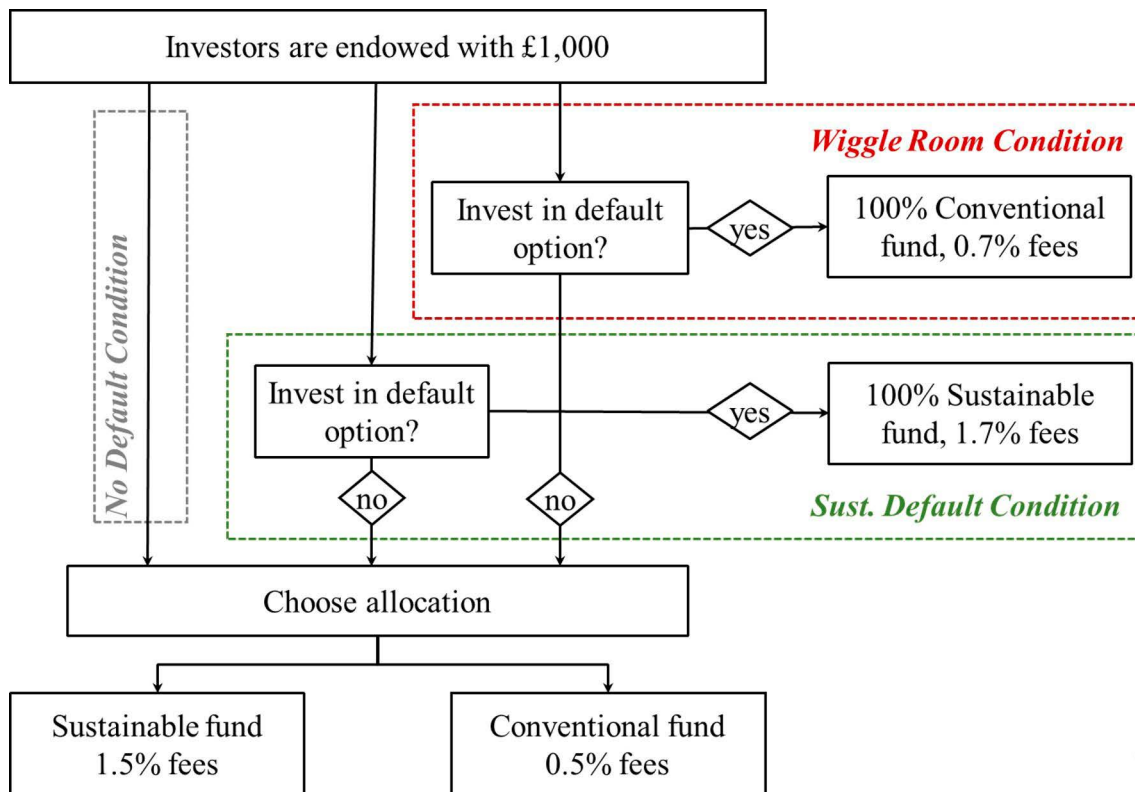
This figure shows the structure of the investment game as well as the three treatments, namely the baseline: no default condition; the conventional default: wiggle room condition; and the secondary default: sustainable default condition.

In addition to the baseline, we introduce a further treatment, the "wiggle room condition," where participants can opt out of the investment task by choosing a default option. We are interested in studying the importance of the default as an excuse that participants might use *not* to invest in the sustainable option. Therefore, the default option is to invest the entire endowment in the conventional fund. In line with the literature on moral wiggle room (Dana et al., 2007), we make the use of the default expensive by increasing the fee to 0.7%. An important feature of the design is that the investment outcome of the moral wiggle room option can be replicated by participants at a lower cost. To do this, participants need to *actively* choose the conventional fund.

It could be that some participants will use the wiggle room option owing to confusion or lack of attention. To control for this, we propose a third treatment, the "sustainable default condition," where the default option is the sustainable fund. Here again, we impose an additional fee for choosing the default of 0.2%. There are no rational explanations of why participants would choose this option since they can

achieve the same allocation themselves at lower cost while also enjoying a warm glow utility from actively choosing the sustainable investment option (Andreoni, 1990). Figure 1 displays the structure of the experiment as well as the different treatments.

2.2 Stated preferences

Stated preferences – Sustainable investing
To complement the measure of the revealed preferences, we also include two questions in our survey that are aimed at measuring the stated preferences for sustainable investing. The first question makes the potential performance trade-off of sustainable investing salient, while the second question does not. The extent to which the stated preferences are sensitive to the performance trade-off indicates the strength of these preferences. Specifically, we ask the following:

– Question 1: A pension fund delivers returns for its members by allocating savings among various investment opportunities, for example, among the different companies to invest in. The UK pension funds have a legal duty to act in the best financial interests of their members and employers. This duty means that they are typically required to allocate their investments based on what they think will produce the best long-term financial outcomes by factoring in sustainability considerations, such as environmental, social, and governance (ESG) issues. Suppose **you could directly control** how your pension was invested. How much should your pension fund invest in a sustainable way, even if this potentially lowers the pension you get in retirement?
– Question 2: How important is it to you that [your pension fund] invests your money sustainably?

If not specifically stated otherwise, our measure of (stated) sustainable preference will be the simple average of the answers to these two questions that are measured on a scale from 1 to 7. By eliciting a measure of stated preference, we are able to compare the measure of the revealed preference, that we developed in the previous section, with a more commonly used metric of sustainable investing preferences.

Question 1 was asked in the survey before the investment game, while Question 2 was asked after the investment game. There is a possibility that, by doing so, we prime the respondents and thus overestimate their revealed preferences for sustainable investing. We chose this approach because we expect it to measure the

preferences with a smaller bias than when starting with the relatively extensive investment game, as we expect the priming effect to be larger in this case.[8]

Stated preferences – Divestments
We also elicit the preferences of participants by excluding 13 industries from their portfolios. In particular, we ask them: *"In your opinion, should all companies involved in the [following] industry be excluded from your pension fund's investments?"*

The industries in question are: tobacco, fossil fuels, pornography, gambling, alcohol, weapons, nuclear power, plus companies that violate labor rights, that are involved in corruption, extortion, or bribery, that are involved in deforestation, that perform animal testing for cosmetics, and that perform animal testing for medical research.

We combine the answers to the exclusion questions in a single variable, "Exclusion preferences", by adding up all "Yes" answers and dividing the sum by 13 (the number of exclusion-related questions in the survey). The total captures the share of industries that respondents would want their pension to divest from.

Stated preferences – Various
We also add survey questions that can help us better understand why respondents make certain choices (Bauer and Smeets, 2015). We follow the validated survey questions developed by Falk, Becker, Dohmen, Enke, Huffman, and Sunde (2018) to measure the altruism, trust, time, and risk preferences of participants. The individual questions are presented in Table A1 of the Appendix.

8   Ideally, we would have run two separate surveys at two separate points in time with the same par- ticipants. Unfortunately, this was not possible, given the restrictions that were imposed by the pension fund.

Table 1: Summary Statistics – Demographics

	N	p25	mean	p50	p75	sd
Age <35	3,709	0	0.18	0	0	0.38
Age 35-49	3,709	0	0.27	0	1	0.45
Age 50-64	3,709	0	0.27	0	1	0.45
Age >64	3,709	0	0.28	0	1	0.45
Income <£45k	3,709	0	0.44	0	1	0.50
Income £45k-£60k	3,709	0	0.27	0	1	0.44
Income >£60k	3,709	0	0.23	0	0	0.42
BA./BSc.	3,709	0	0.16	0	0	0.36
MA./MSc.	3,709	0	0.21	0	0	0.41
Ph.D.	3,709	0	0.56	1	1	0.50
Education Other	3,709	0	0.07	0	0	0.25
Female	3,709	0	0.45	0	1	0.50
Single	3,709	0	0.15	0	0	0.36

This table shows the summary statistics for the demographic characteristics of the sample. All variables are indicators. For example, *Age <35* equals one for respondents below the age of 35.

3. Case Study of a UK pension fund

In 2020, we partnered with USS, a large UK pension fund serving employees of the higher education sector, and ran the investment game as a lab-in-the-field experiment. The pension fund sent an invitation email to all of its active members. Of the 200,000 invitations, about 3,700 responded to the survey request (response rate of just under 2%).

Table 1 shows the summary statistics for our sample. More than half of our sample participants are aged between 35 and 64, and their median income is around £45,000. We have a high representation of respondents with an advanced degree; 56% of the sample hold a Ph.D. The gender representation is quite balanced, and only a small portion of respondents are single.

Table 2 presents the summary statistics for the outcomes of the experiment, as well as other control variables that we use in the remainder of the tests. It is striking to see that the amount invested in the sustainable fund is almost double the amount that is invested in the conventional fund.[9] We will corroborate this evidence in a regression framework later.

We also show summary statistics for the perceived and actual investments in a sustainable fund. In particular, we asked survey participants the following question:

9 The difference between the two variables is statistically significant with a p-value < 0.0001.

Table 2: Summary Statistics – Preferences

	N	p25	mean	p50	p75	sd
Sustainable Fund Investments (£)	3,442	400.00	689.32	800.00	1,000.00	358.37
Conventional Fund Investments (£)	3,442	0.00	310.68	200.00	600.00	358.37
Used sustainable default (%)	1,140	0.00	9.04	0.00	0.00	28.68
Used conventional default (%)	1,139	0.00	3.86	0.00	0.00	19.28
Real-life sust. investment (perceived)	1,865	0.00	0.37	0.00	1.00	0.48
Sustainable preferences (1–7)	3,709	5.00	5.67	6.50	7.00	1.64
Financial literacy (1–7)	3,709	2.00	3.46	3.00	5.00	1.48

This table shows the summary statistics for the main variables used in the analyses. *Sustainable Fund Investments* measures the £ amount invested in the sustainable fund. Similarly, *Conventional Fund Investments* measures the investment in the conventional fund. *Real-life sust. investment (perceived)* is an indicator for participants who believed that they had invested part of their pension savings in a sustainable fund. *Sustainable preferences (1–7)* is the measure of self-stated preference for sustainable investing. *Financial literacy (1–7)* is the self-stated measure of financial knowledge.

"Do you allocate all or part of your pension fund to the [sustainable] options?" We then matched the survey data with the actual allocation decisions of clients to obtain the actual real-life sustainable investment. While 37% of participants believed that they had invested part of their pension in sustainable funds, only 1% actually did so. This discrepancy is indicative of a low level of awareness regarding the pension fund's offerings of sustainable investments.

3.1 Revealed preferences

Figure 2 shows the distribution of the investments in the sustainable fund for the baseline condition when no default option is available. The revealed preferences for sustainable investing appear to be quite strong: participants allocate almost 70% of their endowment to the sustainable fund.

A logical question to ask is whether the strong revealed preferences for sustainable investing are also mirrored by equally strong *stated* preferences for sustainable investing. Indeed, Figure 3 shows that the stated preferences are also strong. The sample average is 5.5 out of 7 for the survey question, which makes the financial trade-off salient. The same figure is slightly higher at 5.8 for the question without an explicit trade-off. Panel (c) of Figure 3 shows that the correlation between the answers to these two questions is very high, which can be interpreted as both measuring the same underlying preferences.

As part of the survey, we also asked participants two additional questions: first, whether they were aware that the pension fund already offered an option for

Figure 2: Allocation to the sustainable fund – Baseline condition
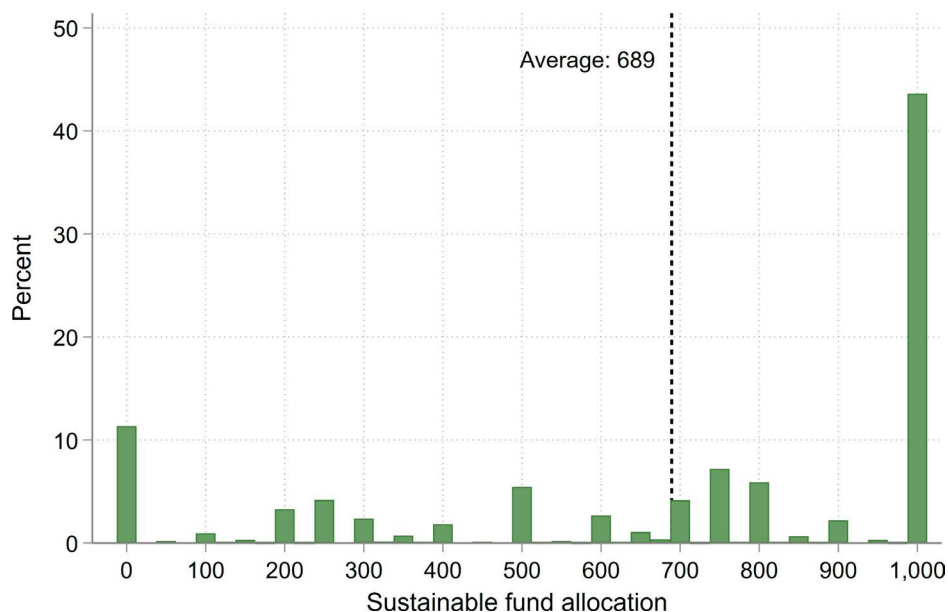
This figure showcases the allocation of participants to the sustainable fund in the baseline condition when no default option is available.

sustainable investment; and second, whether they had invested part of their pension savings in this sustainable option. Figure 4 shows the plot for the average allocation to sustainable funds based on the responses to these two questions. While the first question did not significantly influence the revealed preference of respondents, the second question did. As apparent from the second panel, participants who stated that they allocated part of their pension to the sustainable fund also allocated, on average, twice as many assets to the sustainable fund in our experiment.

Next, we tested the relationship between the revealed preferences for sustainable investing and several other characteristics of respondents, including their stated preferences measured as the average of the two survey questions discussed above. Table 3 shows the results of OLS tests of the GBP amount invested in the sustainable fund, based on participant traits.

Model 1 shows that the economically and statistically strongest correlation is between the stated and revealed preferences for sustainability. A one standard deviation increase in the stated preferences (1.64) correlates with almost £200 higher investment in the sustainable fund. This effect is economically significant and corresponds to an increase of 20% of the available endowment.

Model 2 shows that older respondents tended to allocate slightly less assets to the sustainable fund: stepping up one age bracket, for example, from 35–49 years to 50–64 years, correlates to a £14 reduction in the assets invested in the sustainable

Figure 3: Stated preferences for sustainable investing

(a) Explicit financial trade-off

(b) No explicit trade-off
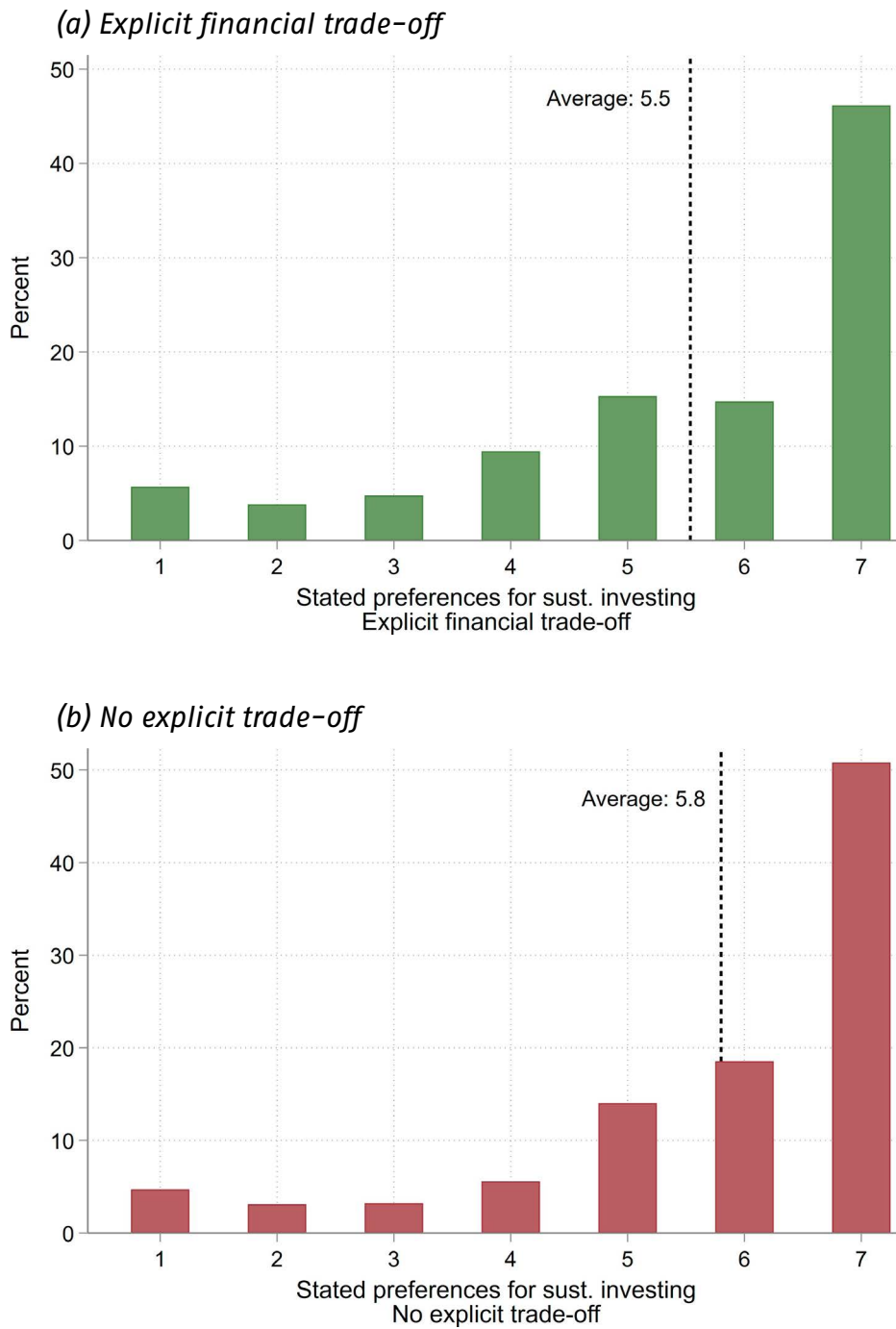
This figure showcases the responses to two survey questions about participants' preferences for sustainable investing, measured on a scale from 1 (the weakest) to 7 (the strongest). The question depicted in the upper panel explicitly mentions that sustainable investing "potentially lowers the pension [the respondents will] get." The question depicted in the lower panel asks: "How important is it to you that [your pension fund] invests your pension sustainably?" The last panel showcases a binned scatter plot of the responses to these two questions.

(c) Binned scatter plot of the two measures of stated preferences for sustainable investing

Stated preference for sust. investing
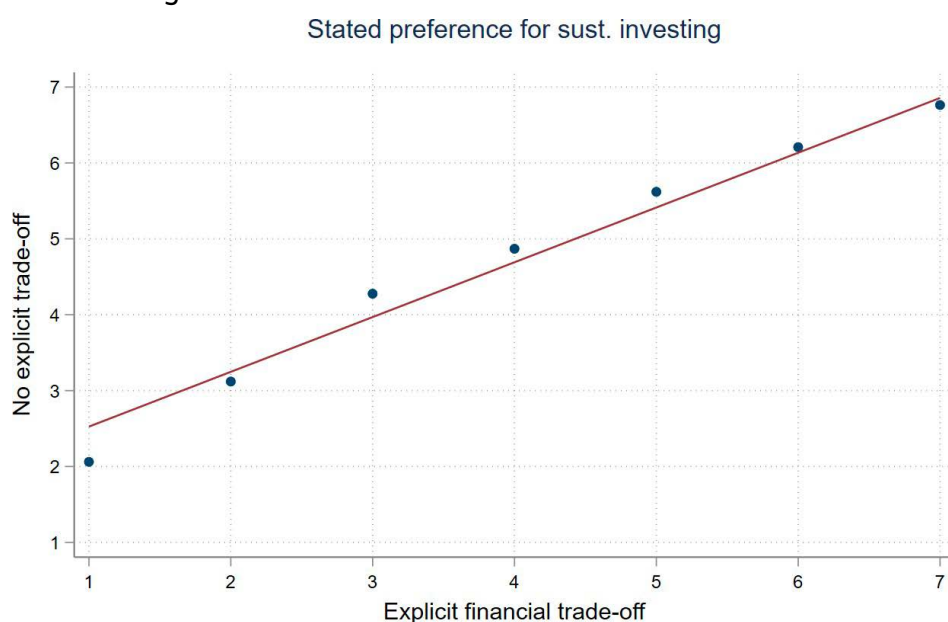
fund. Similarly, respondents who earned more allocated less to the sustainable fund. Compared to other respondents, having a Ph.D. correlates to an additional £45 investment in the sustainable fund. Interestingly, women tended to allocate £75 more in the sustainable fund.

When we include all explanatory variables in a single regression (model 6), only the stated preferences and the female dummy remain statistically significant. Their significance means that, holding age, income, education, and gender constant, the stated preferences for sustainability still had a significant effect on the amount invested in the sustainable fund.

At first sight, this result could be interpreted as evidence that the stated and revealed preferences are the same. We caution against such interpretation. As explained by Falk et al. (2018), running a single survey is not enough to validate that a specific question measures a certain type of preference. It might be the case in a specific setting, such as that of a highly educated client base of a UK pension fund, but does not necessarily generalize to other settings.[10]

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10 Certain participant groups could be more likely than others to complete the survey. Including demographics as controls should alleviate this concern. However, as we have access to the characteristics of the pension fund's entire client population, we can also take these into account directly. Our results are robust to running weighted OLS regressions to account for the full distribution of income by gender.

Figure 4: Stated preferences for sustainable investing

(a) Knowledge about existence of sustainable option

(b) Stated allocation to sustainable option
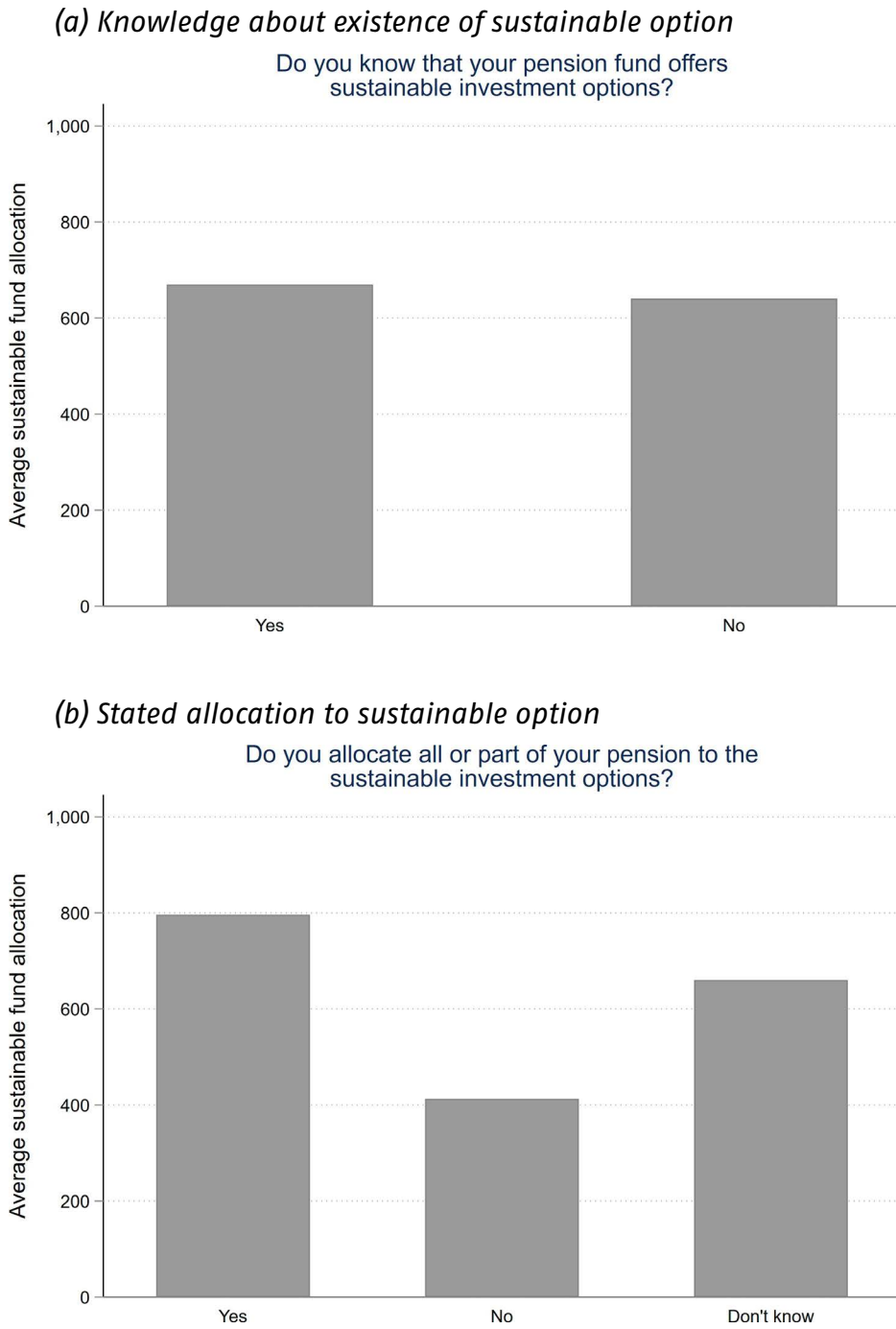
This figure separately showcases the allocation to the sustainable fund by participants who are aware that their pension fund provides a sustainable option (first panel) and by those who state that they allocate part of their pensions to the sustainable option (second panel).

Table 3: Revealed preferences for sustainable investing

Dep. var.:	Sustainable Fund Allocation (£)					
	(1)	(2)	(3)	(4)	(5)	(6)
Sust. preferences	120.28*** (39.72)					119.10*** (38.32)
Age		−13.68*** (−3.69)				4.01 (1.23)
Income			−24.49*** (−5.15)			−4.03 (−0.90)
Ph.D.				44.72*** (3.65)		13.28 (1.26)
Female					74.81*** (6.20)	23.12** (2.19)
Constant	7.46 (0.42)	731.72*** (57.30)	779.51*** (43.29)	664.36*** (73.05)	656.20*** (76.68)	−1.08 (−0.04)
Observations	3,442	3,442	3,442	3,442	3,442	3,442
R-squared	0.30	0.00	0.01	0.00	0.01	0.30

This table shows OLS tests of the GBP amount invested in the sustainable fund based on participant characteristics. Variables are defined as in Table A1 of the appendix. t-statistics are based on robust standard errors and are reported in parentheses. The asterisks (***, **, and *) indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

3.2 The moral wiggle room option

Next we introduce an option that allows participants to invest all of their endowment in the conventional fund for a small fee. We argue that this wiggle room condition might offer participants an excuse *not* to invest in the sustainable fund and therefore to lower the overall amount invested in the sustainable fund. Our hypothesis is that some participants might feel social pressure to invest in the more expensive sustainable fund. These participants ought to be willing to pay a small fee to avoid making the explicit decision not to invest sustainably.[11] To control for default effects (Samuelson and Zeckhauser, 1988) or confusion we add a second option called the sustainable default condition, in which the default is to invest the entire endowment in the sustainable fund for the same additional fee.

To add further reasoning, Figure 5 shows the distribution of the measure for the revealed preference for the two conditions described above. At first sight, there does not appear to be a very large difference between the two treatments. We test this formally below.

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11 Our reasoning is similar to the experiment of Andreoni et al. (2017), in which shoppers in a supermarket prefer to walk to an entrance farther away in order to avoid being asked for donations.

Figure 5: Allocation to the sustainable fund – The default option

(a) Wiggle Room Condition

(b) Sustainable Default Condition
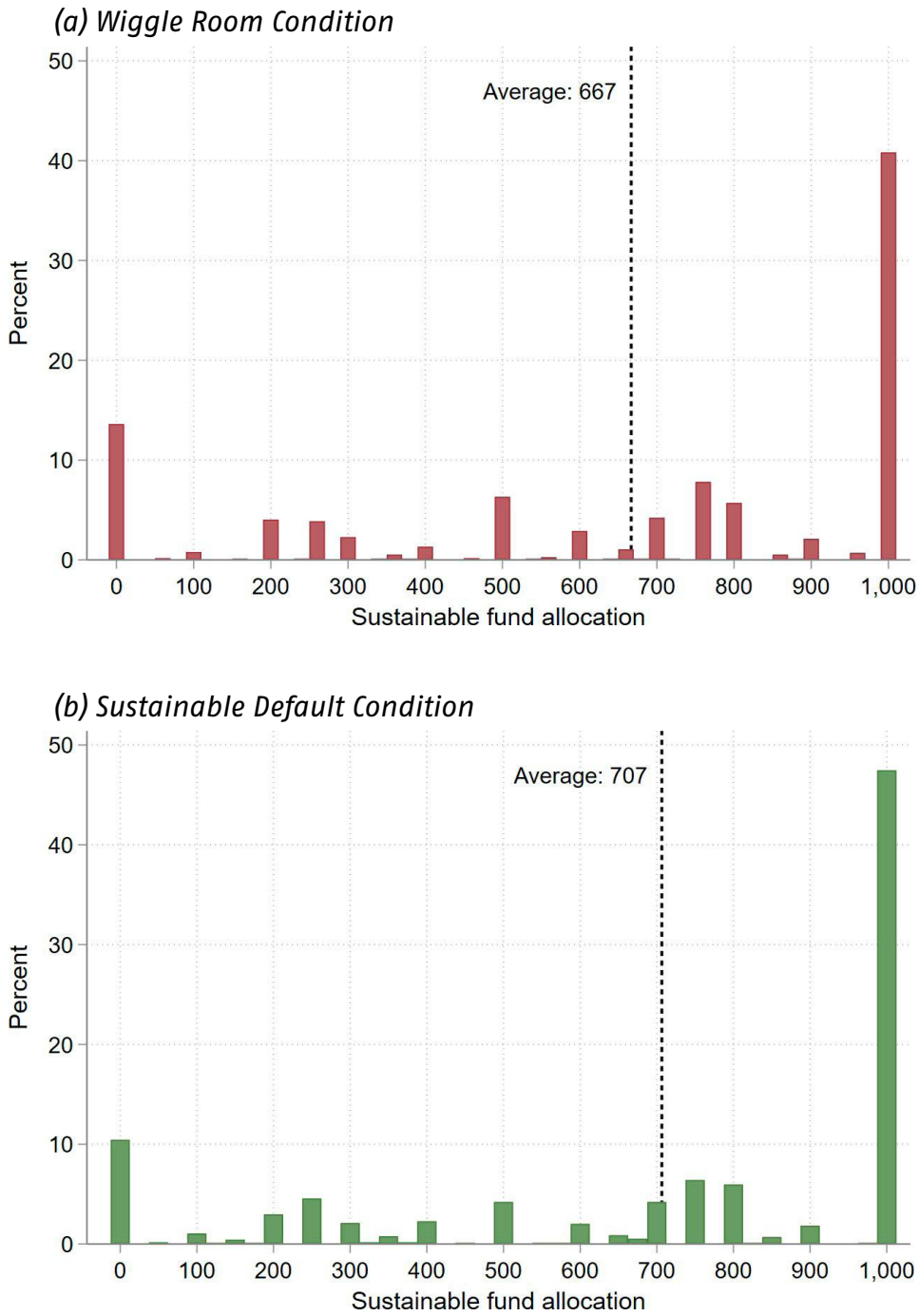
This figure showcases the allocation of participants to the sustainable funds in the two conditions where a default option is available. Panel (a) displays the plot of the wiggle room condition in which the default option is to invest in the conventional fund. Panel (b) shows the conventional default condition.

Table 4: The effect of the default condition

Dep. var.:	Sustainable Fund Allocation (£)		
	(1)	(2)	(3)
Wiggle Room Condition	−27.82*	−32.30***	−32.02**
	(−1.86)	(−2.58)	(−2.56)
Sust. Def. Condition	11.93	13.97	14.70
	(0.81)	(1.13)	(1.18)
Sust. preferences		120.45***	119.27***
		(39.94)	(38.54)
Age			3.94
			(1.21)
Income			−3.74
			(−0.83)
Ph.D.			12.59
			(1.19)
Female			24.09**
			(2.28)
Constant	694.58***	12.60	2.78
	(67.84)	(0.67)	(0.10)
Observations	3,442	3,442	3,442
R-squared	0.00	0.30	0.30

This table shows OLS tests of the GBP amount invested in the sustainable fund, based on the indicators for the wiggle room and sustainable default conditions. The baseline category is the no default condition. Variables are defined in Table A1 of the appendix. t-statistics are based on robust standard errors and are reported in parentheses. The asterisks (***, **, and *) indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Table 4 shows the results of regressions of the amount invested in the sustainable fund on dummies for the two conditions (model 1), as well as the measure of stated preferences for sustainable investing (model 2) and further demographic characteristics (model 3). Compared to the baseline condition where participants invest £695 in the sustainable fund, participants in the wiggle room condition invest £28 less in the sustainable fund. This difference is borderline statistically significant ($p < 0.10$) and economically not very meaningful since it corresponds to only 2.8% of the invested amount. When we control for the stated preferences in model 2, the effect of the wiggle room condition increases slightly to 3.2% ($p < 0.01$). Further controlling for participants' demographics hardly changes the coefficient of interest. Moreover, as expected, the allocation to the sustainable fund does not change significantly in the sustainable default condition.

There are at least three possible explanations for why we find such an economically small effect of introducing the wiggle room condition. First, it could be that the preferences for sustainable investing of our participants are very strong. If this is the

Table 5: Who uses the moral wiggle room option?

Dep. var.:	Used default – Conventional (%)		Used default – Sustainable (%)	
	(1)	(2)	(3)	(4)
Sust. preferences	−0.73**	−0.73**	0.86*	1.16**
	(−2.07)	(−2.02)	(1.69)	(2.23)
Age		0.12		2.62***
		(0.32)		(4.96)
Income		0.21		1.14
		(0.42)		(1.49)
Ph.D.		−0.27		2.16
		(−0.23)		(1.23)
Female		−0.52		0.96
		(−0.43)		(0.53)
Financial literacy (1–7)		−0.73*		−0.82
		(−1.80)		(−1.36)
Constant	8.04***	9.76***	4.17	−8.63*
	(3.84)	(3.00)	(1.38)	(−1.77)
Observations	1,139	1,139	1,140	1,140
R-squared	0.00	0.01	0.00	0.04

This table shows OLS tests of an indicator variable for using the moral wiggle room option on participants' characteristics. Models 1 and 2 show the wiggle room condition, while models 3 and 4 show the sustainable default condition. Variables are defined in Table A1 of the appendix. t-statistics are based on robust standard errors and are reported in parentheses. The asterisks (***, **, and *) indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

case, introducing an excuse to not invest sustainably should have no effect on their asset allocation. Second, the additional cost of the sustainable option might have been too low to deter participants from sustainable investing. Third, it might be the case that sustainable investing is not associated with ethical behavior. If the latter were to be true, then participants who do not want to invest in a sustainable manner would have no reason to search for an excuse to do so. We leave it to future research to establish which of these channels is at play in this setting.

3.3 Who uses the moral wiggle room option?

In this section, we examine who uses the moral wiggle room option. To this end, we regress a dummy (in percentage terms) for using the default on the measure for sustainable stated preferences for sustainable investing as well as demographics. Table 5 presents the results.

The dependent variable in the first two models equals 100 for participants in the moral wiggle room condition who used the conventional default option and zero for the other participants in this treatment. The measure of stated sustainable investing preferences has a strong negative effect: a stated preference that is one standard

deviation higher correlates to a 1.2 percentage point decrease in the probability of using the wiggle room option. This is economically meaningful, given that the unconditional probability of using the wiggle room option lies at 3.9%. This effect remains virtually unchanged when we control for the demographics in model 2.

In the last two models, we regressed the probability of using the default option on the sustainable default condition. In this case, the effect of the stated preferences is reversed, meaning that having stronger stated preferences for sustainable investing correlates to a higher probability of using the sustainable default. However, contrary to the moral wiggle room condition, having the sustainable fund available as a default option does *not* influence the total amount invested in the sustainable fund. Instead, participants who would otherwise have invested in the sustainable fund themselves now choose the default option.

3.4 Alternative explanations

In this section, we explore additional factors that can explain participants' allocation to the sustainable fund. In Table 6 we examine the importance of the sensitivity to financial returns of the stated preferences for sustainability. To this end, we regress the amount invested in the sustainable fund on the difference between the two questions that we use to measure participants' stated preferences: one where we do not mention any trade-offs related to sustainable investing, and one where we make financial trade-offs salient by specifically mentioning that sustainable investments might "lower the pension [participants] get in retirement." Higher values of ΔSust. preferencesTrade-off mean that respondents have a weaker stated preference for sustainable investing when this might reduce financial returns.

Model 1 indicates that the sensitivity to financial trade-offs is negatively related to the revealed preferences for sustainable investing. One standard deviation higher sensitivity (a difference of 1.2) corresponds to a £28 decrease in sustainable investments ($p < 0.0001$). Model 2 shows how this effect relates to the level of the stated preferences. To do so, we interact the sensitivity measure with the measure of the no-trade-off stated sustainable preference. We find a positive and statistically significant interaction term, which means that higher levels of the stated preference mitigate somewhat the negative effect of the sensitivity variable. Suppose two participants have the same level of Sust. preferencesNo trade-off, but one has a sensitivity measure that is one standard deviation higher. The latter will allocate, on average, £107 (=1.16 × (−100.50+7.99)) less to the sustainable fund. In model 3 we confirm that this relationship remains virtually unchanged when we also control for the demographics of participants.

Table 6: Sensitivity of stated preferences

Dep. var.:	Sustainable Fund Allocation (£)		
	(1)	(2)	(3)
ΔSust. preferences [Trade-off]	−23.35***	−100.50***	−98.83***
	(−4.33)	(−8.32)	(−8.16)
Sust. preferences [No trade-off]		121.46***	120.31***
		(40.09)	(38.68)
ΔSust. preferences [Trade-off] × Sust. preferences [No trade-off]		7.99***	7.61***
		(3.43)	(3.26)
Age			3.77
			(1.16)
Income			−3.33
			(−0.75)
Ph.D.			12.66
			(1.20)
Female			20.87**
			(1.97)
Constant	695.33***	−4.55	−13.32
	(110.06)	(−0.26)	(−0.52)
Observations	3,442	3,442	3,442
R-squared	0.01	0.30	0.31

This table shows OLS tests of the GBP amount invested in the sustainable fund on the sensitivity of stated sustainable preferences for financial trade-offs, ΔSust. preferencesTrade-off. The sensitivity is measured as the difference between the response to the question that measures the stated preferences for sustainability *without* making the financial trade-off explicit and to the question where the financial trade-off is explicit. A positive ΔSust. preferencesTrade-off means that the participant is less willing to hold sustainable assets when they might reduce financial returns. Sust. preferencesNo trade-off measures the response to the stated preferences without financial trade-offs on a scale from 1 to 7. t- statistics are based on robust standard errors and are reported in parentheses. The asterisks (***, **, and *) indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Finally, we ask what other types of preferences relate to our measure of underlying preferences for sustainable investing. First, we look at the preferences for exclusions (divestments) of participants on a scale from 0 to 1, where 1 means that a respondent is in favor of excluding all of the potential 13 industries.[12]

Moreover, we follow Falk et al. (2018) and measure participants' levels of altruism and trust as well as their time and risk preferences. Table 7 shows the regressions of our measure of revealed preferences for sustainable investing on these additional variables.

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12 See subsection 2.2 for more details on how this measure was constructed. The specific choice of industries that we included in the survey was made in coordination with the pension fund.

Table 7: Alternative preference measures

Dep. var.:	Sustainable Fund Allocation (£)					
	(1)	(2)	(3)	(4)	(5)	(6)
Exclusion pref.	750.04*** (20.56)					704.92*** (18.68)
Altruism		35.86*** (7.63)				12.25*** (2.74)
Trust			3.45 (1.01)			0.63 (0.20)
Time				21.87*** (4.84)		11.34*** (2.69)
Risk					−13.07*** (−3.21)	−9.75*** (2.61)
Age	−10.97** (−2.48)	−9.94** (−2.02)	−9.66* (−1.92)	−7.46 (−1.49)	−9.08* (−1.81)	−9.69** (−2.19)
Income	−11.00* (−1.81)	−22.65*** (−3.38)	−23.76*** (−3.50)	−23.84*** (−3.52)	−21.96*** (−3.23)	−9.90 (−1.63)
Ph.D.	51.36*** (3.65)	62.44*** (4.11)	63.32*** (4.11)	59.04*** (3.85)	60.45*** (3.94)	48.05*** (3.42)
Female	−3.58 (−0.25)	23.82 (1.54)	42.70*** (2.75)	46.79*** (3.02)	36.42** (2.35)	−11.61 (−0.79)
Constant	282.65*** (8.84)	475.80*** (11.29)	706.88*** (21.76)	560.42*** (13.07)	783.14*** (24.52)	178.56*** (3.59)
Observations	2,205	2,205	2,205	2,205	2,205	2,205
R-squared	0.19	0.05	0.02	0.03	0.03	0.19

This table shows OLS tests of the GBP amount invested in the sustainable fund on different preference measures (Falk et al., 2018). All preference measures have values from 0 to 10. Variables are defined in Table A1 of the appendix. t-statistics are based on robust standard errors and are reported in parentheses. The asterisks (***, **, and *) indicate that the parameter estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Model 1 shows that these preferences strongly correlate with the revealed preferences for sustainable investing. Being in favor of excluding one additional industry (40% of a standard deviation) relates to an additional £57.70 of sustainable investments.

Riedl and Smeets (2017) show that prosocial preferences are an important driver of sustainable investing. A similar relationship could exist with altruism, when it is measured as the "willingness to give to good causes without expecting anything in return." Model 2 shows this to be the case: participants that are one standard deviation more altruistic (1.68) allocate £60 more to the sustainable fund. On the other hand, being more trusting does not have a similar effect.

Starks, Venkat, and Zhu (2020) show that, at least for institutional investors, long-term considerations is related to stronger ESG preferences. Model 4 shows that this relationship also holds in our setting: more long-term participants invest more in

the sustainable fund. Finally, sustainability can also be seen as a source of insurance against environmental and social risks.[13] Indeed, Model 5 shows that participants with a higher risk appetite invest less in the sustainable fund. Finally, the results in Model 6 confirm the previous findings when we include all preference measures at the same time. Even when we account for altruism, risk, and time preferences, participants with stronger preferences for exclusions invest significantly more in the sustainable fund.

13 Bolton and Kacperczyk, 2021; Ceccarelli et al., 2021; Engle, Giglio, Kelly, Lee, and Stroebel, 2020; Hsu, Li, and Tsou, 2022 all have shown that low-carbon investing has a lower exposure to climate risks. The evidence is less clear for the social dimension of sustainable investing.

4. Conclusion and discussion

It is becoming increasingly important for institutional investors to understand the preferences of their clients with respect to sustainability. Recently, policymakers in the European Commission have also recognized this need and have mandated the measurement of sustainability preferences in the context of investment advice (EU, 2021).

In the Netherlands, pension funds are particularly important institutional investors: beneficiaries contribute a significant portion of their income to their pensions without having the flexibility of choosing a specific fund. Thus, it is crucial that pension funds make investment decisions that are in line with the preferences of their clients, especially when these decisions go beyond financial risk and return considerations (Bauer, Van Tuyll, and Veldpaus, 2022b). Many Dutch pension funds have started to gauge the preferences of their participants, mainly through surveys (Bauer, Ruof, and Smeets, 2022a). This paper provides a practical example, through the use of an incentivized investment game, as to how pension funds can gauge the preferences of their clients. Furthermore, we test this experiment in the field by collaborating with a large UK-based pension fund.

In summary, we find that the revealed and the stated preferences of respondents are consistent with each other. Showing such internal consistency is important for preference measures (Falk et al., 2018). Moreover, in our setting, the preferences for sustainable investing remain largely unaffected by the introduction of moral wiggle room in the form of a conventional default option.

Ideally, the responses of participants would have had real-life implications that, in our setting, could only have been achieved with an ex-ante commitment from the pension fund (Bauer et al., 2021). However, the approach proposed in this paper represents a simple way to reduce the hypothetical gap bias that is embedded in measuring stated preferences through surveys. Furthermore, the strong consistency between the stated and revealed preferences makes us confident that our approach is sound.

While we measure preferences for sustainability in the UK, we argue that our approach can be applied to the Dutch context as well, plus to the US and other European countries. Certainly, preferences for sustainability will differ across countries (see, e.g., Falk et al. (2018) or Gutsche, Engler, and Smeets (2022)) and across pension funds. However, the underlying approach of how to *measure preferences* will not. Moreover, our approach will become particularly useful if and when pension funds also need to measure their clients' preferences for sustainability in addition to preferences for risk (Alserda et al., 2019).

A natural next step would be for researchers to demonstrate the robustness of the stated preferences for sustainability in other settings. For example, they could replicate our approach with participants from other countries and from different backgrounds.

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Appendix

Table A1: Definitions of variables

Sust. preferences	Self-stated measure of sustainable preferences is the average of the responses to the following two questions on a scale of 1 to 7. *"How important is it to you that [the pension fund] invests your pension sustainably?"* and *"Suppose you could directly control how your pension is invested. How much should your pension fund invest in a sustainable way, even if this investment potentially lowers the pension you get in retirement?"*
Age	Variable that captures the various age brackets of respondents; namely, under 25, 25-34, 35-44, 45-49, 50-54, 55-64, 65-74, and 75 or older.
Income	Variable that captures the various income brackets of respondents; namely, up to £25,000, £25,001 - £33,000, £33,001 - £44,000, £44,001 - £59,585, and £59,586 or higher.
Ph.D.	Indicator variable equal to one if the respondent holds a Ph.D.
Female	Indicator variable equal to one if the respondent is a woman
Real-life sust. investment (perceived)	Indicator variable equal to one if the respondent answers "Yes" to the following question: *"Do you allocate all or part of your pension fund to the ethical options?"*
Financial literacy	Self-stated measure of financial literacy. It is the response (on a scale from 1 to 7) to the following question: "*How do you see your knowledge about pension-related matters?*"
Altruism	Altruism is measured as the answer to the question: *"To what extent are you generally willing to give to good charitable causes without expecting anything in return?"*
Trust	Trust is measured as the answer to the question: *"How well does the following statement describe you as a person? As long as I am not convinced otherwise, I assume that people have only the best of intentions."*
Time	Time preference is measured as the answer to the question: *"To what extent are you prepared to give up something that currently benefits you to benefit more from it in the future?"*
Risk	Risk preference is measured as the answer to the question: *"How do you see yourself from a financial perspective? Are you someone who is fully willing to take risks, or do you try to avoid risks?"*

Survey instructions

The survey instructions are attached in the document below. Dotted lines mark page breaks in the survey. "Jigsaw" is the firm that ran the survey. Instructions about how the survey was run, for example which questions should appear in random order, or what fraction of participants see which part of the survey, are marked with Jigsaw. Some parts of the survey are marked with brackets to warrant the anonymity of the pension fund. The figures inserted in the instructions highlight what the survey looked like for participants.

<div align="center">

Welcome!

</div>

[The pension fund] is interested in members' attitudes and behaviours regarding how their money is invested in the scheme. We have worked with Maastricht University to design the following survey, which is open to all [the pension fund] members.

It will form part of an international research project that will bring together insights from [the pension fund] members with those from other major pension schemes.

Five members who complete the survey will be chosen at random to win £50 in vouchers. There will also be additional opportunities to win prizes, which will be explained in the relevant sections of the survey (and covered in the terms and conditions).

It takes **about 15 minutes** to complete the questionnaire, and your response will be completely anonymous unless you give specific consent to further use of your data at the end of the survey (please see our privacy policy for further details; any questions about the research can be directed to datasecurity@jigsaw-research.co.uk).

Note that this survey is conducted in collaboration with independent scientific researchers of Maastricht University, and was approved under ethical approval code ERCIC_217_30_09_2020 by the Ethical Review Committee Inner City Faculties (ERCIC) of Maastricht University. Your responses will be treated confidentially and analyzed/reported anonymously. Those involved from Maastricht University do not have any relevant or material financial interests that relate to the research conducted. The purpose of the research study is to inform [the pension fund] decision-making and to produce scientific reports.

Thank you for your participation! [the pension fund] and Maastricht University

1. A pension fund delivers returns for its members by allocating savings among various investment opportunities, e.g., among different companies to invest in.

   UK pension schemes like [the pension fund] have a legal duty to act in the best financial interests of scheme members and employers. This means that they are typically required to allocate their investment based on what they think will produce the best long-term financial outcomes, while factoring in sustainability considerations, such as environmental, social and governance (ESG) issues.

   Suppose **you could directly control** how your pension is invested. How much should your pension fund invest in a sustainable way, even if this potentially lowers the pension you get in retirement?
   a. 1 (not at all)
   b. 2
   c. 3
   d. 4
   e. 5
   f. 6
   g. 7 (to the full extent)
....

@Jigsaw: Randomize order of next 3 questions

If its trustees believe that sustainability issues make it an unsuitable financial investment, a pension fund can decide to divest from a specific industry, i.e., remove all money that is invested in companies of a specific industry (so-called "exclusions"). We are going to ask for your opinion on common areas for exclusion.

2. In your opinion, should all companies involved in the tobacco industry be excluded from your pension fund's investments?
   a. Yes
   b. No
   c. I don't know
....

3. In your opinion, should all companies involved in the fossil fuel (i.e., oil and gas) industry be excluded from your pension fund's investments?
   a. Yes
   b. No
   c. I don't know
....

4. In your opinion, should all companies that violate labor rights (e.g., use child labor or forced labor) be excluded from your pension fund's investments?
   a. Yes
   b. No
   c. I don't know

· ·

In your opinion, should your pension fund exclude from its portfolio firms that:
@Jigsaw: Show all these questions one below the other with a binary Yes // No option (Even if not shown here). All questions should appear on the screen at once
@Jigsaw: Randomize the order of the questions on this page

5. Operate in the pornography industry
   a. Yes   b. No
6. Operate in the gambling industry
   a. Yes   b. No
7. Produce alcohol
   a. Yes   b. No
8. Produce weapons
   a. Yes   b. No
9. Operate in the nuclear power industry
   a. Yes   b. No
10. Operate in the aviation industry
    a. Yes   b. No
11. Are involved in corruption, extortion, or bribery
    a. Yes   b. No
12. Are involved in deforestation
    a. Yes   b. No
13. Perform animal testing for cosmetics
    a. Yes   b. No
14. Perform animal testing for medical research
    a. Yes   b. No

· ·

Making investments

We now want you to decide how you would invest £1,000. In this task you can choose between two funds to invest in. The two funds differ in how they account for sustainability in their investment strategy and charge different fees.

Five participants in the task will be chosen at random in an additional prize draw. The winners will have their investment choices implemented by Maastricht University.

@Jigsaw: Please insert a link below this screen with two boxes similar to below (continue box should be larger than the skip box).

Continue to the task and get a chance of winning a prize	Skip task and forgo chance of winning a prize

@Jigsaw: Show the following only if "continue to experiment" was selected
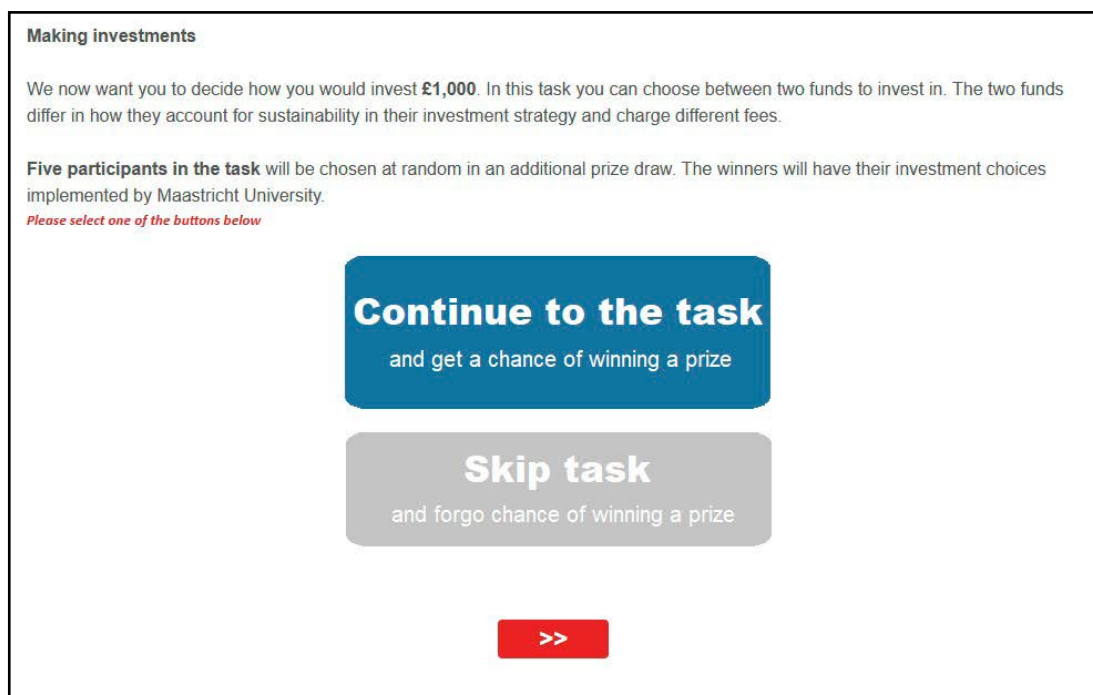
Relevance of your choice

If you are selected in the prize draw and you decided to allocate £500 to fund A and £500 to fund B, then Maastricht University will invest £500 in fund A and £500 in fund B for a period of six months, from December 1, 2020 to May 31, 2021.

After six months, you will receive a gift voucher for £50 plus the return of the fund investment (which could be a positive or negative amount).

For example, if your allocated investment of £1,000 is worth £1,075 after six months, then you would receive a gift voucher worth:

£50 + £75 = £ 125.

Now suppose your allocated investment of £1,000 is worth £975 after six months. Then you would receive a gift voucher worth:

£50 – £25 = £ 25.

If your allocated investment of £1,000 is worth £950 or less after six months, then you will lose all of the prize money.

Relevance of your choice

If you are selected in the prize draw and you decided to allocate £500 to fund A and £500 to fund B, then Maastricht University will invest £500 in fund A and £500 in fund B for a period of six months, from December 1st 2020 to May 31st 2021.

After six months, you will receive a gift voucher for £50 plus the return of the fund investment (which could be a positive or negative amount).

For example, if your allocated investment of £1,000 is worth £1,075 after six months , then you would receive a gift voucher worth:

£50 + £75 = £125.

Now suppose your allocated investment of £1,000 is worth £975 after six months. Then you would receive a gift voucher worth:

£50 - £25 = £25.

If your allocated investment of £1,000 is worth £950 or less after six months, then you will lose all of the prize money.

>>

@Jigsaw: Show the following only for 2/3 of participants. Remaining 1/3 skip to fund choice screen

On the next page, you will be able to choose between the two funds:

- conventional fund that **costs 0.5%** of the allocated investment
- sustainable fund that **costs 1.5%** of the allocated investment

Alternatively, you can decide to skip this task, in which case we will invest the £1,000 for you in the default option. This comes with an **additional fee of 0.2%**.

The default option is to allocate all the money in the conventional fund at a total cost of 0.7% of the allocated investment / sustainable fund at a total cost of 1.7% of the allocated investment.

@Jigsaw: There are 3 treatments here: 1/3 of participants get as default Fund A, 1/3 Fund B, and 1/3 get no default option (i.e. don't see this page at all).

Choose funds myself	Default option for a small fee of 0.2%

On the next page, you will be able to choose between the two funds:

• conventional fund that **costs 0.5%** of the allocated investment
• sustainable fund that **costs 1.5%** of the allocated investment

Alternatively, you can decide to skip this task, in which case we will invest the £1,000 for you in the default option. This comes with an **additional fee of 0.2%.**

The default option is to allocate all the money in the sustainable fund that costs a total of 1.7% of the allocated investment .

Please select one option

Choose funds myself

Default option
for a small additional fee of 0.2%

. . . .

The two funds
@Jigsaw: Randomize order of (a) and (b)

Fund A: UK Market Fund
This fund provides an investment in stocks that is well−diversified. The fees are 0.5% of the allocated investment.

More information @Jigsaw: Show this text with a hover.
The Fund generally invests in large and midcap stocks which are contained in the MSCI United Kingdom index. The relative weightings of the companies correspond to their weightings in the index.

Fund B: UK Market Fund with Sustainability Integration
This fund provides an investment in stocks that is well−diversified and integrates environmental, social, and governance (ESG) factors. The fees are 1.5% of the allo−cated investment.

More information @Jigsaw: Show this text with a hover.

The Fund generally invests in large and midcap stocks which are contained in the MSCI United Kingdom Extended SRI index. The relative weightings of the companies correspond to their weightings in the index.

The MSCI UK Extended SRI index is a benchmark for investors seeking exposure to best-in-class ESG United Kingdom companies while avoiding products whose social or environmental impact is considered to be negative by investors. These are companies involved in nuclear power, tobacco, alcohol, gambling, military weapons, civilian firearms, GMOs, thermal coal and adult entertainment.

Your choice

Please enter the amounts you would like to allocate to the two funds. Note, they should add up to £1,000 in total.

Fund A: _____

Fund B: _____

@Jigsaw: Please add boxes to the right of each investment and allow for positive amounts only. All boxes should be set to zero as defaults. Also, the participants will be allowed to continue to the next question only after they have allocated the entire sum of 1,000 GBP. Make sure to record how much time it takes participants to make their choices.

@Jigsaw: If participants try to enter something negative, please provide an error message "Only positive amounts can be selected".

@ Jigsaw: Below each name, there is a link "More information" that can be clicked. When clicked, the description below the text appears. If possible, please record which links are clicked and how long it takes before the next link is clicked.

The two funds

Fund A: UK Market Fund

This fund provides an investment in stocks that is well-diversified. The fees are 0.5% of the allocated investment.

☐ More information

Fund B: UK Market Fund with Sustainability Integration

This fund provides an investment in stocks that is well-diversified and integrates environmental, social, and governance (ESG) factors. The fees are 1.5% of the allocated investment.

☐ More information

Your choice:

Please enter the amounts you would like to allocate to the two funds. Note, they should sum up to £1,000 in total.
Please type in below for each row

Fund A: UK Market Fund	
Fund B: UK Market Fund with Sustainability Integration	
	Total 0

>>

. . . .

In this section we ask the following questions to better understand your general preferences in the context of everyday life.

@Jigsaw: Randomize order of next 4 questions

15. To what extent are you generally willing to give to good causes without expecting anything in return?

    Please use a scale from 0 to 10, where 0 means "not prepared at all" and 10 means "very willing". You can also use the values in-between to indicate where you fall on the scale.

    a. 0 (not prepared at all)
    b. 1 → 9
    c. 10 (very willing)

. . . .

16. How well does the following statement describe you as a person?
    As long as I am not convinced otherwise, I assume that people have only the best intentions.
    Please use a scale from 0 to 10, where 0 means "does not describe me at all" and 10 means "describes me perfectly". You can also use the values in-between to indicate where you fall on the scale.
    a. 0 (does not describe me at all)
    b. 1 → 9
    c. 10 (describes me perfectly)

. . . .

17. To what extent are you prepared to give up something that currently benefits you to benefit more from it in the future?
    Please use a scale from 0 to 10, where 0 means "not prepared at all" and 10 means "very willing". You can also use the values in-between to indicate where you fall on the scale.
    a. Not prepared at all: 1 → 10: very willing

. . . .

18. How do you see yourself from a financial perspective: are you someone who is fully willing to take risks, or do you try to avoid risks?
    Please use a scale from 0 to 10, where 0 means "not prepared at all" and 10 means "very willing". You can also use the values in-between to indicate where you fall on the scale.
    a. **0 (not prepared at all)**
    b. **1 → 9**
    c. **10 (very willing)**

. . . .

The following questions provide more clarity about your views on how [the pension fund] incorporates sustainability issues into its investment processes.

19. How important is it to you that [the pension fund] invests your pension sustainably?
    a. Very unimportant (1) → (7) highly important

. . . .

20. Do you have savings in the defined contribution (DC) part of [the pension fund]?
    a. Yes
    b. No
    c. I don't know

@Jigsaw: If the answer is no (or I don't know?), then skip the next two questions.

21. Are you aware that [the pension fund] offers two [sustainable] investment options [...] for its defined contribution clients?
    a. Yes
    b. No

22. Do you allocate all or part of your pension fund to the [sustainable] options?
    a. Yes
    b. No
    c. I don't know

. . . .

We would also like to ask you some background questions.

23. Do you currently hold any investment in the financial market? By this we mean shares of a stock, an investment fund, bonds, or other instruments, outside of your [the pension fund] pension?
    a. Yes
    b. No
    c. I don't know

. . . .

24. Do you identify as...
    a. Male
    b. Female
    c. Other (please specify)
    d. Prefer not to say

25. How old are you?
    a. Under 25
    b. 25-34
    c. 35-44
    d. 45-49
    e. 50-54
    f. 55-64
    g. 65-74
    h. 75 or older
    i. Prefer not to say

26. Would you describe your role, broadly speaking, as one which is wholly or predominantly...?
    a. Academic or academic-related
    b. Professional services
    c. Other (please specify)
    d. Prefer not to say

27. Which situation applies most to you?
    a. Single
    b. I have a partner, but I don't live cohabitate
    c. I have a partner with whom I live
    d. Prefer not to say

28. How many children does your household include? _____

29. What is the highest education you have completed?
    a. O-level/GCSE
    b. A-level
    c. BA/Bsc.
    d. MA/Msc.
    e. Ph.D.
    f. Other: _____
    g. I have not completed any of the above types of training
    h. Prefer not to say

We have a few questions about your financial situation. We understand that this information is sensitive, and you may decide to skip these questions. But since your answers to these questions are very valuable to the research, we hope you will answer them. We will handle your data very conscientiously.

30. Which of the following bands best describes your total salary per year before tax?
    a. Up to £10,000
    b. £10,000 – £18,000
    c. £18,001 – £25,000
    d. £25,001 – £33,000
    e. £33,001 – £44,000
    f. £45,001 – £59,585
    g. £59,586 – £65,000
    h. £65,000 – £85,000
    i. Above £85,000
    j. Don't know
    k. Prefer not to say

. . . .

31. How do you see your knowledge about pension-related matters?
    a. Very little knowledge: 1 → 7: Thorough knowledge

Please read and agree to the following:

I concur that the scientific data from this research will be stored on a computer and understand that it can contribute to scientific publications and presentations. The data are completely anonymous and will not reveal my identity as an individual in publications or presentations.

In order to add context to the study, we would like to link the survey data you have provided with certain administrative data already held by [the pension fund] (such as any investment choices you have made). All data will be carefully anonymised by [the pension fund] prior to being shared with Maastricht University for analysis and publication (further details can be found in our terms and conditions and privacy policy). @Jigsaw: Please insert a link to the privacy policy and the terms and conditions supplied by [the pension fund]).

I agree that the fully anonymised scientific data from this study may be shared with other researchers.

I understand that my participation is voluntary and that I can withdraw at any time without any reason by contacting datasecurity@jigsaw-research.co.uk.

I have read and understood the information. By choosing "I consent" below I agree to participate.

Consent:

☐ I CONSENT
☐ I DO NOT CONSENT

. . . .

32. If you win one of the two prize draws, we will need to contact you via email to let you know that you have won. If you win the secondary prize draw associated with taking part in the investment game, we will also confirm with you before going ahead with the investment.
Please tick the box below if you wish to be considered.
☐ I want to be considered for the relevant prize draw(s) [@Jigsaw: Please insert a tick box on the right of the question]

33. Your email address.
My email address is: _____

Thank you so much for participating.
Maastricht University and [the pension fund]

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