# Do Investors Care about Impact?

Heeb et al. (2023)

Env Climate discussion group S16

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# Research goals

Assess willingness-to-pay (WTP) for sustainable investments with a framed field experiment:

1. w.r.t. the level of social impact
2. w.r.t. the dedication of investors
3. w.r.t. the comparison between projects
4. the driving force

(Why important? There can be a severe risk of greenwashing in sustainable finance. Product design can be decoupled from the real impact.)

# Background

- Standard decision theory: investors are consequentialists
  $\longrightarrow$ **proportionality** between derived utility and impact of the investment
  v.s. **scope insensitivity** as in charity & public good valuation literature

- Field experiment:
  - choose between Sustainable investment (quantified impact) and Financially equivalent investment (zero impact): impact = CO2 emission reductions
  - real money and real impact (choices are incentivized and consequential)
  - elicit WTP for Sustainable investment
  - vary the impact (by a factor of 10)
  - 527 experienced private investors + 125 dedicated high-net-worth impact investors

# Main Result

- WTP is substantial but no significant proportionality *(some are sensitive but only a second-order effect in aggregate)*

  $\Longrightarrow$ care about whether impactful but not really the magnitude
- Robustness:
  - investors understand and recall the impact of the investment
  - different variations:
    - what if investors care about financial performance?: vary the past financial performance instead of their impact.

      ($\Rightarrow$ WTP is highly sensitive to diffs in financial performance)
    - experimenter demand effect? elicitation method influence?: an additional sample and more variations
    - sample of 554 university students: results hold before and after the Covid-19 crisis

# Other results

- reasons for the observed insensitivity to impact:
  1. lack experience in dealing with impact? **NO.**
     with unique sample of high-net-worth impact investors: also insensitive.
  2. the ability to directly compare impact information? **Not really.**
     Joint evaluation setup and give information on the two sustainable investments juxtaposed (vary the impact by a factor of 10): 28% WTP diff to 900% impact diff, although direct comparison helps (1/3 entirely insensitive while the most sensitive 1/3 pay almost proportional)
  3. relative / absolute level matters? **Only relative**$\Rightarrow$ the choice set matters!
     Rescaling the impact for each investment barely changes WTP.
  4. emotions as a driver? **YES.**
     By postexperiment survey: WTP is correlated with the level of positive emotions experienced during the choice-making (rather than from the evaluated impact size).

# Experiment

- all experiments: between May and September 2020, & robustness checks: in April and May 2022.
- Both sustainable and conventional investment options are presented as equity funds
- vary the level of impact between subjects (to see how WTP responds to the level of impact)
- measure investors' WTP in terms of the front-end fee that investors are willing to pay for the sustainable investment
- proceeds in four steps: instructions, information on investments, investment decisions, and a postexperiment survey

# Procedure (1)

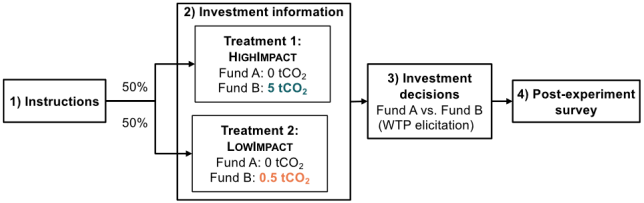


**Figure 1**
**Experimental procedure of the main experiment**
This figure provides an illustration of the four steps of the experimental procedure we use in our main experiment. In the second step, participants are randomly assigned either to the HIGHIMPACT treatment or the LOWIMPACT treatment.

1. Investors receive detailed instructions on the investment decisions *(guide through an example and make a quiz)* and on investor incentivization *(make investment on their behalf with relatively high stakes)*.
To guarantee the true preference revelation: use BDM mecanism to determine in which option to invest and a front-end fee (deduct from the investment amount)

2. Receive information about the financial performance and the impact of the two investment options, including asset class, the market segment, the annualized return over the last 3 years, and the risk level; and additionally for sustainable option: how much CO2 emissions saved (and more intuitively comprehensible figures: trees planted, kilometers of air travel, and daily emissions of an average EU citizen)

# Alternative framing of sustainable investing to avoid experimenter demand

| | Fund A | Fund B | ℹ |
|---|---|---|---|
| **Fund Category** | US Large-Cap Blend Equity | US Large-Cap Blend Equity | **Asset class** and **market segment** in which the fund invests. |
| **Annualized Return (3 years)** | **6%** | **6%** | Average amount **earned** by an investment in the fund each year. |
| **Morningstar™ Risk** | Average<br>Low Average High | Average<br>Low Average High | Assesses the **variations** in a fund's monthly returns, compared to similar funds. |
| **Climate Change** | An investment of €1000 in this fund **saves 5000 kg of $CO_2$** emissions.<br><br>This corresponds to:<br>• The $CO_2$ saved by planting **30 trees.**<br>• The $CO_2$ emissions of traveling **15000 km** by plane.<br>• The $CO_2$ emissions caused by an EU citizen in **250 days**. | An investment in this fund does not save $CO_2$ emissions. | Some funds finance projects that **save $CO_2$ emissions.**<br><br>Some experts argue that this is a valuable way of how investors can **contribute** to fighting climate change.<br><br>Other experts argue that this is a **distraction** and may delay the policies needed to fight climate change (e.g., carbon taxes). |

Data retrieved: 15-05-2020

**Figure 2**
**Investment information in the main experiment**
This figure provides a screenshot of the information the investors participating in our main experiment receive on the two investments if they are assigned to the HIGHIMPACT treatment. The investment information investors in the LOWIMPACT treatment receive is shown in Figure A.3.

# Procedure (2)

2(cont.). randomly assign investors to one of two different treatments, HIGHIMPACT and LOWIMPACT
(a quiz to guarantee the salience of all relevant information; investors who twice fail receive the correct answers and a short explanation)

3. elicit investors' WTP for the sustainable investment option:
   - investors make binary choices: repeatedly choose between the sustainable investment (A) and the conventional investment (B)
   - indicate a one-time, upfront fee that varies between consecutive choices, depending on respondents' answers: Both options start with the same fee, 10 EURO. If a participant prefers A, we increase the fee for A by 40 EURO and ask again
   - Using the bisection method, also called the midweight method, we iteratively adjust the fee to elicit an investor's WTP
   - after the investment decisions have been made we ask respondents to confirm whether the elicited WTP reflects their true preferences. If not, repeat the procedure once, if they wish (otherwise excluded).

# Procedure (3)

4. Postexperiment survey:

A manipulation test to check whether investors understood and remembered the investment information provided. 1) to recall which investment had a higher impact and 2) how much impact the sustainable investment had exactly.

Second, questions about investors' financial expectations about the investments, the feelings they associate with their choices, their perception of the impact of the sustainable investment, their individual preferences, as well as their demographic characteristics.

Data processing: exclude:
- 6 investors who disagree with climate change being a serious problem, because CO2 savings are an inappropriate measure.
- 17 investors who explicitly disagree with the elicited WTP and are unwilling to repeat the investment decisions
- a final sample of 196 investors out of 219 (the others participated in extensions)

# Analysis and Result

**Results of the main experiment**

| | Mean Values | | Mann–Whitney $U$ Test |
|---|---|---|---|
| | LowImpact ($n$=97) | HighImpact ($n$=99) | (HighImpact = LowImpact) |
| **Experimental Results** | | | |
| WTP (€) | 42.49 | 48.78 | $p$=.363 |
| WTP/Impact (€/t$CO_2$) | 81.25 | 8.38 | $p$<.001 |
| Sustainable investment preference (%) | 93.81 | 92.93 | $p$>.999 |
| **Postexperiment Survey Results** | | | |
| Risk expectations [−10,10] | −0.526 | −0.051 | $p$=.382 |
| Return expectations [−10,10] | −0.312 | −0.707 | $p$=.348 |
| Positive emotions [−10,10] | 6.134 | 6.465 | $p$=.121 |
| Perceived investment impact [−10,10] | 4.089 | 5.488 | $p$=.003 |
| General relevance impact [−10,10] | 3.643 | 4.276 | $p$=.142 |
| General relevance impact level [−10,10] | 2.474 | 2.896 | $p$=.457 |
| Estimated cost of saving $CO_2$ (€/t$CO_2$) | 94.55 | 102.43 | $p$=.658 |

- WTP: Of all investors, 93% prefer the sustainable option when fees are equal in the two funds; an average WTP of 45.67 euro for 1000 euro investment
- the level of impact of sustainable investments does not significantly affect investors' WTP ⇒ observed insensitivity to impact leads to a substantial inconsistency in investors' WTP per unit of impact.
- not driven by differences in risk and return expectations

# Robustness checks (1)

- Impact evaluation failure?
  ask investors to recall the impact information and to estimate the price of emission savings; try translating the CO2 savings into more intuitively comprehensive units
- consistency?
  ask investors how important it is to them 1) their investments contribute to halting climate change, 2) how much they contribute (assign importance to an investment having an impact and to how much impact an investment has; higher importance for whether)
- effectiveness of elicitation method?
  vary the investments' past performance, rather than their impact, between the two treatments & no impact information $\Rightarrow$ WTP for past performance is correctly measured: pay significantly more in the HighReturn treatment and a consistent WTP per unit of improved past performance (almost proportional)

# Robustness checks (2)

- replicable with different elicitation methods?
  replicate the main experiment with a set of samples from the crowd-working platform Amazon Mechanical Turk and test eight different variations of our elicitation method (estimate changes up to $\pm 30\%$; none changes the insignificance)
  Also: only accepted participants with outstanding reputations; added attention check, and applied more stringent screening criteria about comprehension questions and the speed with which the experiment was conducted
- lack of statistical power?
  No, all replicated well With a larger sample of MTurk participants
- experimenter demand effects?
  introduce additional variation in the investments' risk and return characteristics: holding the conventional option fixed, 1) sustainable investment features a lower past return and a better risk profile, 2) it features a higher return and an inferior risk profile.
  significantly lower WTP estimate but still no significant diff between two treatment group

# Robustness checks (3)

- (cont.)
  *"While we cannot rule out that the focus on impact differences in our original procedure leads to somewhat inflated WTP estimates, our results hold in a setting in which this focus is substantially reduced"*
- specifications of the elicitation method affect the outcome?

  The findings essentially replicate with a broad set of alternative specifications:
  1. omit bisection and directly ask for WTP:
     1) No anchoring information on costs associated with investments,
     2) Low Anchor: a passively managed fund may charge an annual fee of 0.1% per year
     3) High Anchor: an actively managed fund may charge a 1% fee per year
  2. vary several specifications of our discrete choice method:
     1) omit the first discrete choice of our original procedure, in which investors decide between the two investments with fees being equal
     2) vary the bisection approach: a much smaller fee increase of \$1.25 and double the diff until the deviation; iteratively reduce the fee difference to narrow down the estimate
     3) keep the original bisection method but decrease or, respectively, increase the initial fee difference by 50% (\$20 or \$60)

# Robustness Checks (4)

- results affected by the COVID-19 crisis?
  A preliminary version of the experiment with 311 students at a large Dutch university before COVID-19 and 243 students at the same university after it; no substantial differences.

# Exploring reasons behind insensitivity to scale

Three potential explanations:

- lack of knowledge or experience for correct evaluation
  1) already put several measures in place
  2) repeat with a unique sample of dedicated impact investors (alumni network of UZurich for high-net-worth impact investors; 118/125
- ability to compare several options
  a joint evaluation setup with a conventional option, a high-impact option, and a low-impact option (to emphasize the relative level) with private investors
  $\Rightarrow$ increased comparability leads to a significant difference in WTP between the two sustainable investments but the sensitivity remains limited; still no proportionality
- positive emotions / the warm glow associated with choosing a sustainable option (rather than a calculative appraisal of the impact)
  The post-experiment survey shows that choosing a sustainable investment feels good to investors; investors' valuation of a unit of impact increases with positive emotions, but not with their cost estimate for a unit of impact.

# Sample of dedicated impact investors

**Preferences and demographics for the impact investors, by treatment**

| | Mean Values | | Mann–Whitney $U$ Test |
|---|---|---|---|
| | LowImpact ($n$=59) | HighImpact ($n$=59) | (HighImpact = LowImpact) |
| Risk preferences [0,10] | 7.169 | 6.898 | $p$=.521 |
| Time preferences [0,10] | 8.508 | 8.068 | $p$=.119 |
| Altruism [0,10] | 7.763 | 7.169 | $p$=.131 |
| Climate awareness [0,10] | 9.096 | 8.983 | $p$=.814 |
| Female [0,10] | 0.356 | 0.407 | $p$=.705 |
| Age | 41.424 | 38.966 | $p$=.456 |
| Income | €125,000–€149,999 | €150,000–€174,999 | $p$=.543 |
| Net worth | €1M–€9.9M | €1M–€9.9M | $p$=.931 |
| Highest education | Master's degree | Master's degree | $p$=.828 |
| Investment knowledge [0,10] | 6.877 | 6.707 | $p$=.650 |

# joint evaluation setup

| | Fund A | Fund B | Fund C | |
|---|---|---|---|---|
| **Fund Category** | US Large-Cap Blend Equity | US Large-Cap Blend Equity | US Large-Cap Blend Equity | **Asset class** and **market segment** in which the fund invests. |
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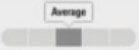
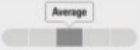
| **Morningstar™ Risk** |   |   |   | Assesses the **variations** in a fund's monthly returns, compared to similar funds. |
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# Emotions

OLS regression: indep var = WTP for the sustainable investment per unit of impact

**Emotions, cost estimates, and investors' valuation of impact**

| | Private Investors | | Impact Investors | | MTurks | |
|---|---|---|---|---|---|---|
| | (1) WTP/tCO$_2$ | (2) WTP/tCO$_2$ | (3) WTP/tCO$_2$ | (4) WTP/tCO$_2$ | (5) WTP/tCO$_2$ | (6) WTP/tCO$_2$ |
| Positive emotions | 4.341*** | 4.314*** | 3.408** | 2.668* | 4.826*** | 4.680*** |
| | (0.968) | (0.957) | (1.229) | (1.326) | (0.384) | (0.388) |
| Estimated cost of saving 1 ton of CO$_2$ | 0.0318 | 0.0165 | −0.0117 | −0.00976 | 0.00232* | 0.00197 |
| | (0.0235) | (0.0237) | (0.00781) | (0.00831) | (0.00113) | (0.00114) |
| Impact treatment | −77.76*** | −78.21*** | −86.57*** | −86.07*** | −76.17*** | −76.14*** |
| | (7.132) | (6.998) | (8.919) | (9.295) | (2.919) | (2.916) |
| Demographics | No | Yes | No | Yes | No | Yes |
| Constant | 56.20*** | −63.67 | 74.91*** | 15.94 | 52.51*** | 83.37*** |
| | (8.124) | (44.96) | (11.80) | (46.45) | (3.349) | (17.38) |
| Observations | 195 | 195 | 117 | 117 | 1,000 | 1,000 |
| $R^2$ | 0.416 | 0.486 | 0.492 | 0.524 | 0.464 | 0.474 |
| F | 45.40 | 10.53 | 36.54 | 9.534 | 287.0 | 74.12 |

The end!