Do Investors Care About Impact?

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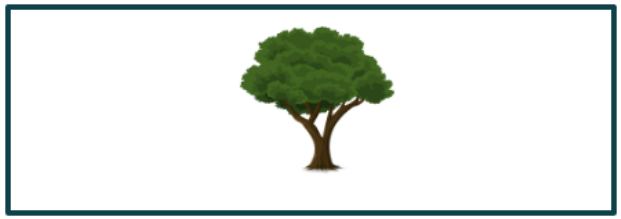
Motivation

- **Sustainable investing** is seen as a mechanism to curb negative externalities (Pástor et al., 2021; Broccardo et al., 2020; Heinkel et al., 2001; Pedersen et al., 2020; Oehmke and Opp, 2019).
- There are investors with **pro-social preferences** (Riedl and Smeets, 2017; Hartzmark and Sussman, 2019).
- ...and a **willingness-to-pay, (WTP)** for sustainability (Barber et al., 2021; Bauer et al., 2021).

Research Question

- Theoretical models assume pro-social investors are **consequentialists**.
  - Investors deliberately trade off financial wealth with impact.
  - Impact = positive externality of an investment.
- In charitable giving and public good valuation, individuals often exhibit **scope insensitivity**.
  - Donors respond to the presence of impact, but not to its extent (Hsee and Rottenstreich, 2004)
  - Similar WTP to save 2000 or 200'000 birds (Desvousges et al., 1992)

Research Question



vs.

Research Question

How does investors' WTP for sustainable investment products respond to the impact of these products?

Approach: Pre-Registered Framed Field Experiment

Participants:

- Panel of 500+ experienced **private investors** (provided by VEB)
- Unique panel of 100+ **(U)HNWI dedicated impact investors**.

Design:

- Choice between two investments: one with impact and one without impact.
- We vary the amount of impact of the investment between subjects.

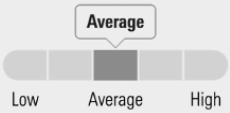
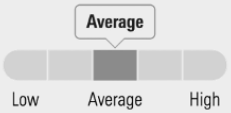
Key variables:

- Independent variable: Impact (tCO_2 emissions saved with investment)
- Dependent variable: WTP for the sustainable investment option (up-front fee)

Incentivized, consequential decisions:

- Real investment of EUR1,000 for 10 participants (randomly selected)
- Real impact: We realize CO_2 offsets according to fund's impact

Low Impact Treatment

	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			Assesses the **variations** in a fund's monthly returns, compared to similar funds.
Climate Change	An investment of €1000 in this fund **saves 500 kg of CO_2** emissions. This corresponds to: • The CO_2 saved by planting **3 trees.** • The CO_2 emissions of traveling **1500 km** by plane. • The CO_2 emissions caused by an EU citizen in **25 days**.	An investment in this fund does not save CO_2 emissions.	Some funds finance projects that **save CO_2 emissions.** Some experts argue that this is a valuable way of how investors can **contribute** to fighting climate change. Other experts argue that this is a **distraction** and may delay the policies needed to fight climate change (e.g., carbon taxes).

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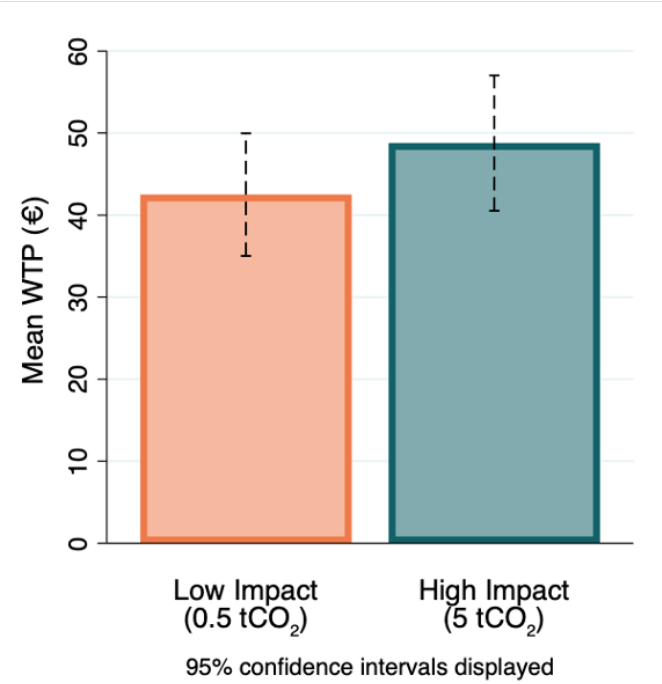
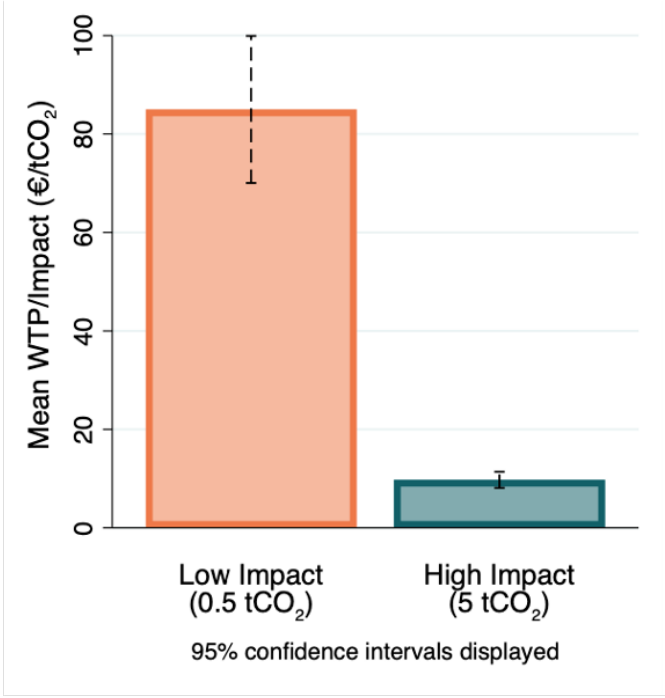
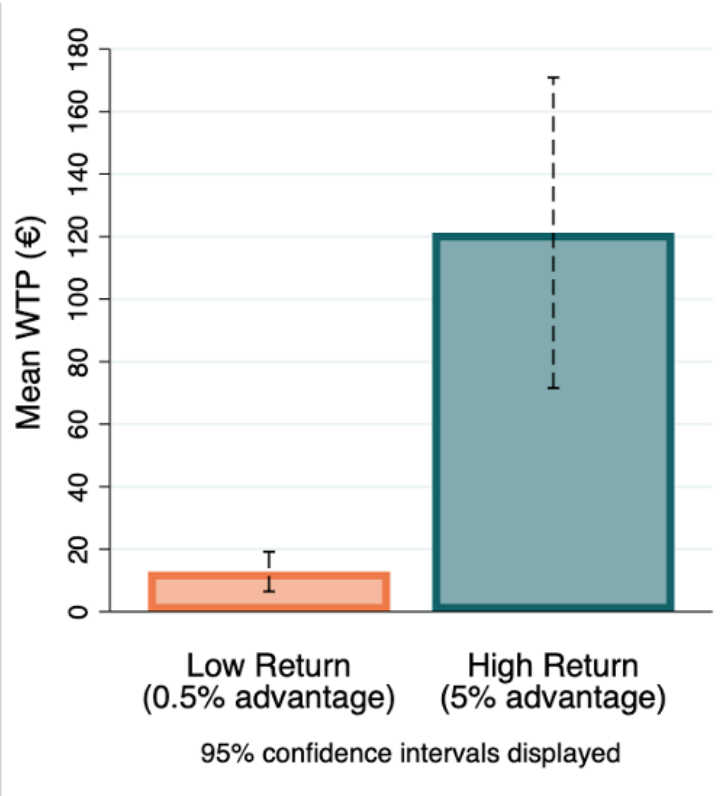
Main Result: WTP Does Not Respond to Impact





- **Substantial WTP** for investments with impact (**p<0.001**, Mann-Whitney).
- **Amount of impact** does not (significantly) affect WTP (p=0.265, Mann-Whitney).
- **Inconsistent valuations** per unit of impact (**p<0.001**, Mann-Whitney).

Robustness: Can Our Setup Pick Up Sensitivity?



- We can measure investors **sensitivity to past return**. ($p<0.001$, Mann-Whitney, $n=89$)

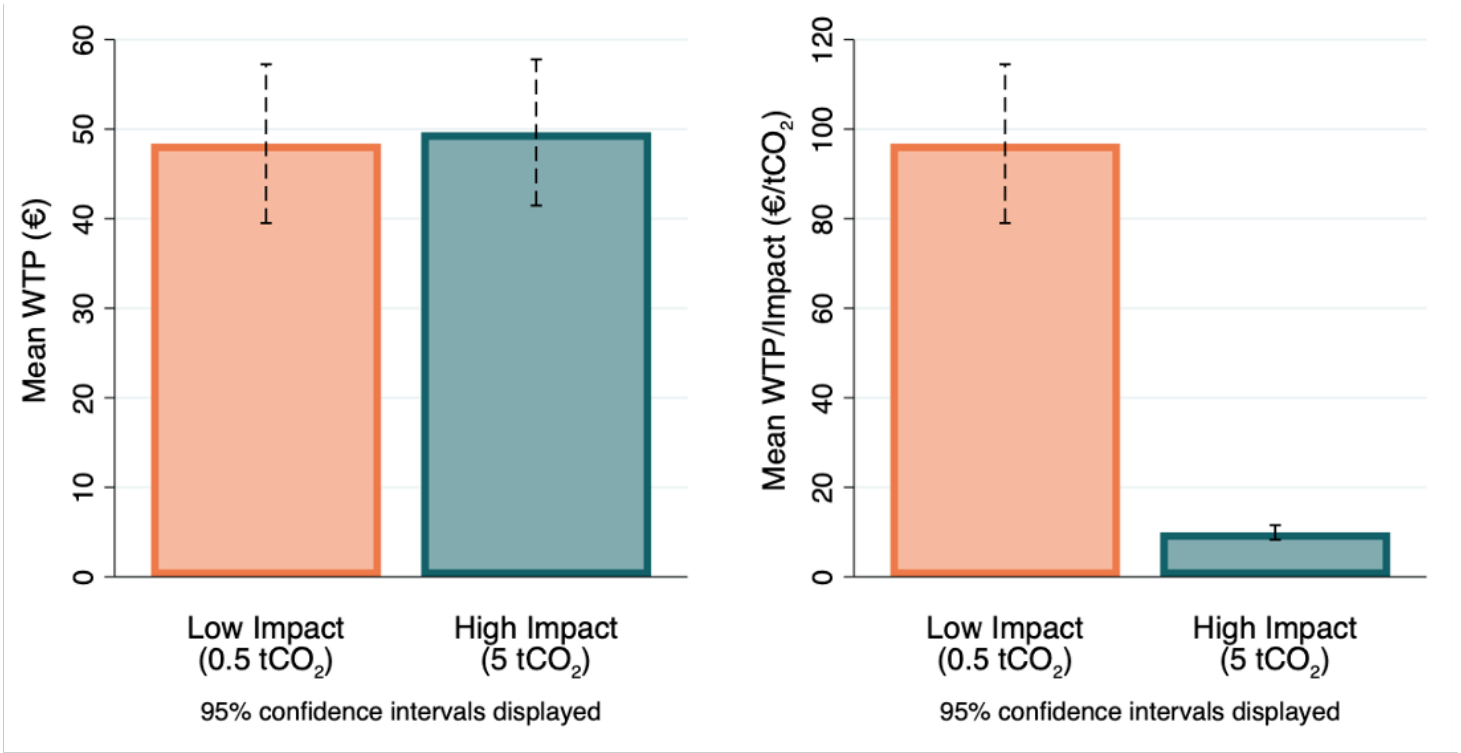
Further Robustness Checks

- Risk and Return Expectations are not significantly different between the treatments
- 95% remember the exact level of impact.
- Investors correctly identify the HighImpact treatment as a more meaningful impact ($p = 0.003$, Mann-Whitney).
- Investors have a realistic cost estimate of saving CO_2 emissions (average: $EUR98.55/tCO_2$).
- A replication with students shows the same results, before and after Covid.

Possible Explanations for the Insensitivity

1. The role of **experience**: Are dedicated impact investors sensitive to impact information?
2. The role of **comparability**: Are investors sensitive when options are evaluated side by side?
3. The role of **emotions**: To what extent can the emotional response (warm glow) explain WTP?

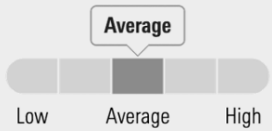
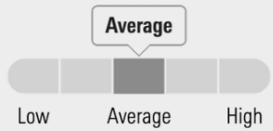
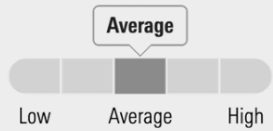
The Role of Experience



- Replication with a sample of dedicated impact investors (n=125)
- Also this group is not sensitive to the amount of impact

The Role of Comparability

High Impact Range Treatment

	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.
Annualized Return (3 years)	**6%**	**6%**	**6%**	Average amount **earned** by an investment in the fund each year.
Morningstar™ Risk				Assesses the **variations** in a fund's monthly returns, compared to similar funds.
Climate Change	An investment into Fund A does not save CO_2 emissions.	An investment of €1000 in this fund **saves 500 kg of CO_2** emissions. This corresponds to: • The CO_2 saved by planting **3 trees.** • The CO_2 emissions of traveling **1500 km** by plane. • The CO_2 emissions caused by an EU citizen in **25 days**.	An investment of €1000 in this fund **saves 5000 kg of CO_2** emissions. This corresponds to: • The CO_2 saved by planting **30 trees.** • The CO_2 emissions of traveling **15000 km** by plane. • The CO_2 emissions caused by an EU citizen in **250 days**.	Some funds finance projects that **save CO_2 emissions.** Some experts argue that this is a valuable way of how investors can **contribute** to fighting climate change. Other experts argue that this is a **distraction** and may delay the policies needed to fight climate change (e.g., carbon taxes).

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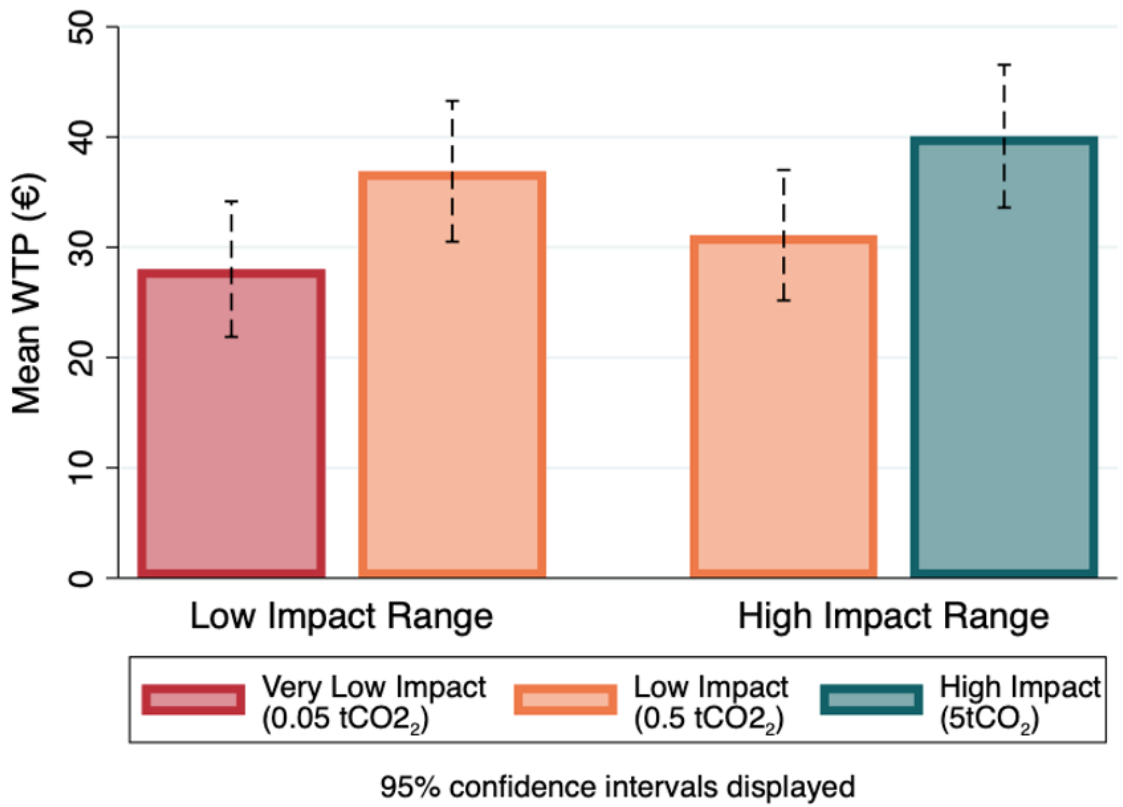
The Role of Comparability

- Comparability increases sensitivity.
- But the choice set has a strong influence on WTP.



The Role of Emotions

Emotions are positive, but unaffected by treatment

	Mean Positive Emotions [-10,10]		**Mann–Whitney *U* test**
	LowImpact	HighImpact	(HighImpact = LowImpact)
Private Investors	6.1	6.5	$p = 0.121$
Impact Investors	7.8	6.9	$p = 0.209$

Effect of Emotions on WTP

$$WTP/t_i = Emotions_i + CostEstimate_i + ImpactTreatment_i + \epsilon_i$$

	Model 1 Private Investors	Model 2 Impact Investors
	(1) WTP/t CO_2	(2) WTP/t CO_2
Positive emotions	4.34^{***}	3.41^{**}
	(0.97)	(1.23)
Estimated cost of saving a ton of CO2	0.03	-0.01
	(0.03)	(0.01)
Treatment	-77.73^{***}	-86.58^{***}
	(7.14)	(8.92)
Constant	56.25^{***}	74.92^{***}
	(8.15)	(11.80)
R^2	0.42	0.49
Observations	195	117

- Suggests that decisions are driven by emotional evaluation.

Conclusion

- Investors have a substantial WTP for sustainable investments.
- WTP does not respond to the absolute level of impact.
- Experience does not increase sensitivity.
- WTP responds with comparability, but is strongly affected by the choice set.
- Emotions drive individual WTP.

A consistent explanation is: WTP is driven by positive emotions about having impact, not impact itself.

Conclusion: Investors care about impact. But they do not act like consequentialists, rather like warm glow optimizers.

Contributions

- Investor decisions and pro-social preferences
  - We suggest to view of pro-social investors as warm glow optimizers.
  - Consistent with Riedl and Smeets (2017), also Hartzmark and Sussman (2019).
- Asset pricing and pro-social preferences
  - Our findings question the assumption of rational trade-offs between financial wealth and impact.
  - Models may need to account for warm glow and choice set dependency.
- Concurrent Working Papers on WTP
  - Bonnefon et al. (2019) and Brodback et al. (2021) suggest there is a *linear* relationship between WTP and impact.
  - We believe this can be reconciled. Scope insensitivity usually emerges for non-monetary goods.

Implications

- Risk that sustainable investing has less impact than expected.
- Asset managers have incentives to optimize their offering for warm glow not for impact.
- Potential solutions:
  - Design labels so that maximum warm glow coincides with maximum impact
  - State impacts in monetary units

Thank you for your attention!

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Tabulated Results Main Experiment (Table 2)

Table: Detailed Results Main Experiment

	Mean Values		Mann–Whitney U test
	LowImpact ($n = 97$)	HighImpact ($n = 99$)	(HighImpact = LowImpact)
Experimental Results			
WTP (€)	42.49	48.78	$p = 0.363$
WTP/Impact (€/tCO_2)	81.25	8.38	$p < 0.001$
Post-experiment Survey Results			
Risk expectations [-10,10]	-0.526	-0.051	$p = 0.382$
Return expectations [-10,10]	-0.312	-0.707	$p = 0.348$
Positive emotions [-10,10]	6.134	6.465	$p = 0.121$
Perceived investment impact [-10,10]	4.089	5.488	$p = 0.003$
General relevance impact [-10,10]	3.643	4.276	$p = 0.142$
General relevance impact level [-10,10]	2.474	2.896	$p = 0.457$
Estimated cost of saving CO_2 (€/tCO_2)	94.55	102.43	$p = 0.658$

Tabulated Results Impact Investors (Table 4)

Table: Detailed Results Impact Investors

	Mean Values		Mann–Whitney U test
	LowImpact ($n = 59$)	HighImpact ($n = 59$)	(HighImpact = LowImpact)
Experimental Results			
WTP (€)	48.38	49.64	$p = 0.767$
WTP/Impact (€/tCO_2)	0.98	9.93	$p < 0.001$
Post-experiment Survey Results			
Risk expectations [-10,10]	0.678	0.593	$p = 0.991$
Return expectations [-10,10]	0.169	0.254	$p = 0.952$
Positive emotions [-10,10]	7.797	6.864	$p = 0.209$
Perceived investment impact [-10,10]	3.898	5.085	$p = 0.314$
General relevance impact [-10,10]	6.158	6.158	$p = 0.820$
General relevance impact level [-10,10]	5.763	4.746	$p = 0.182$
Estimated cost of saving CO_2 (€/tCO_2)	404.57	291.47	$p = 0.258$

Censored WTP (Table A.3)

Table: Main results excluding investors with censored WTPs

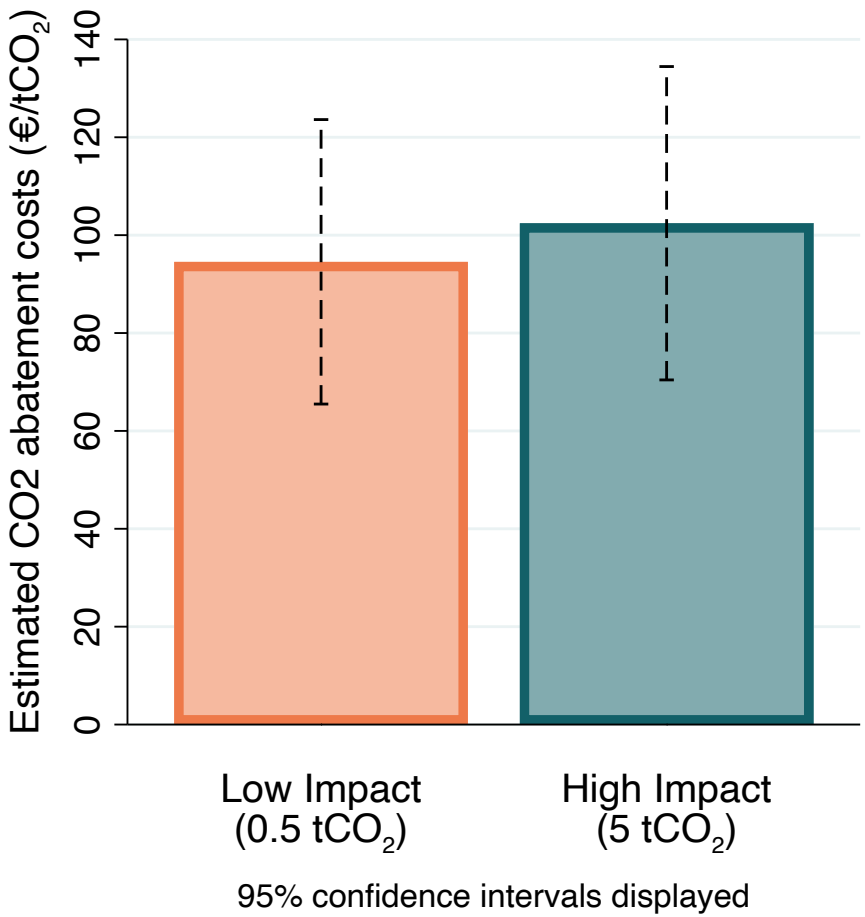
	Mean values		Mann-Whitney U test
	LowImpact ($n = 81$)	HighImpact ($n = 74$)	(HighImpact = LowImpact)
WTP (€)	30.24	28.22	$p = 0.903$
WTP / Impact (€/tCO$_2$)	60.48	5.64	$p = 0.001$

Before and after COVID (Table A.4)

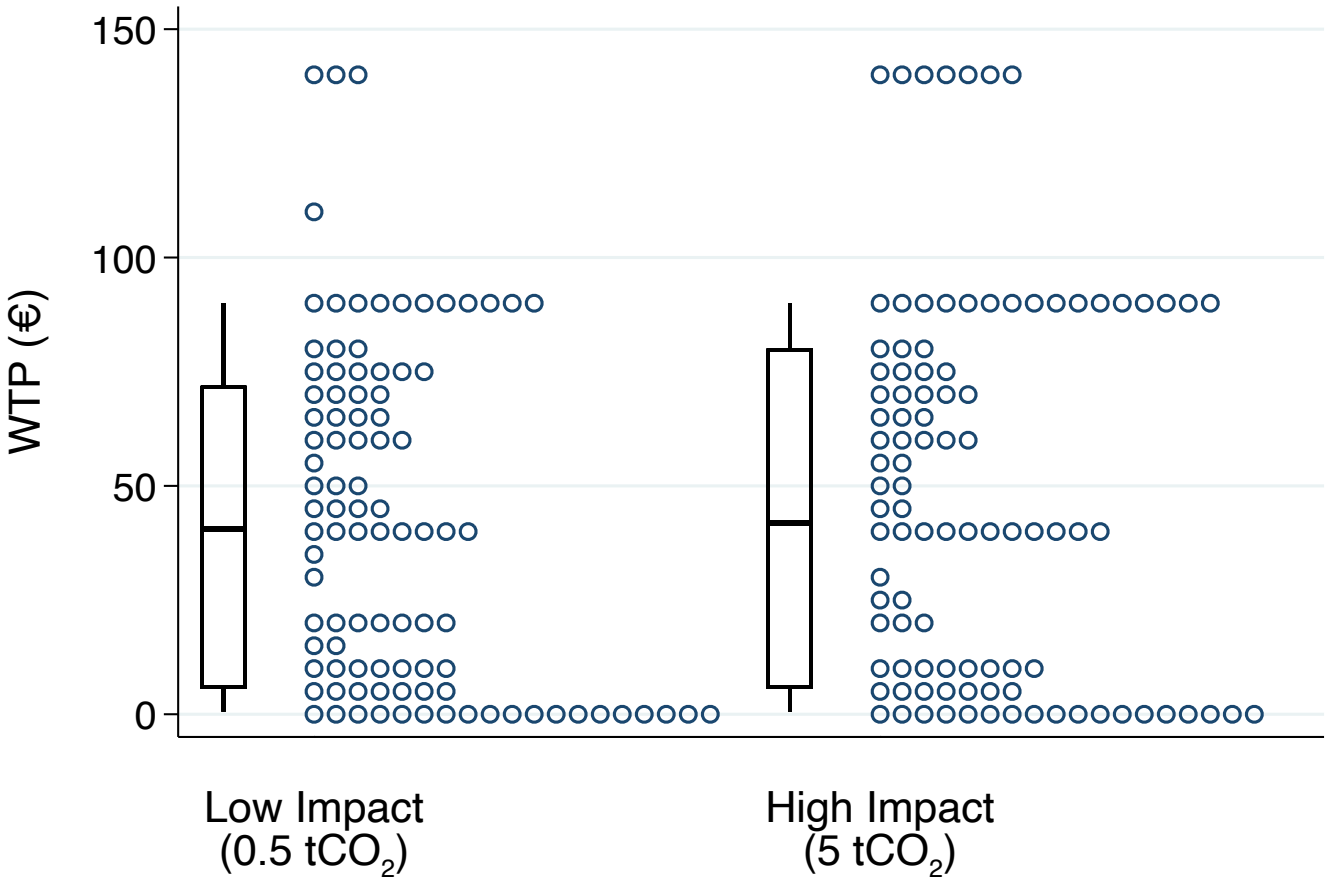
Table: WTP before and after the onset of the Covid-19 crisis

	Mean values		Mann-Whitney U test
	LowImpact	HighImpact	(HighImpact = LowImpact)
September 2019			
N	159	152	
WTP (€)	27.64	29.82	$p = 0.533$
WTP / Impact (€/tCO_2)	55.28	5.96	$p < 0.001$
September 2020			
N	119	123	
WTP (€)	32.03	27.85	$p = 0.262$
WTP / Impact (€/tCO_2)	64.04	5.57	$p < 0.001$

Cost of CO_2 Estimates

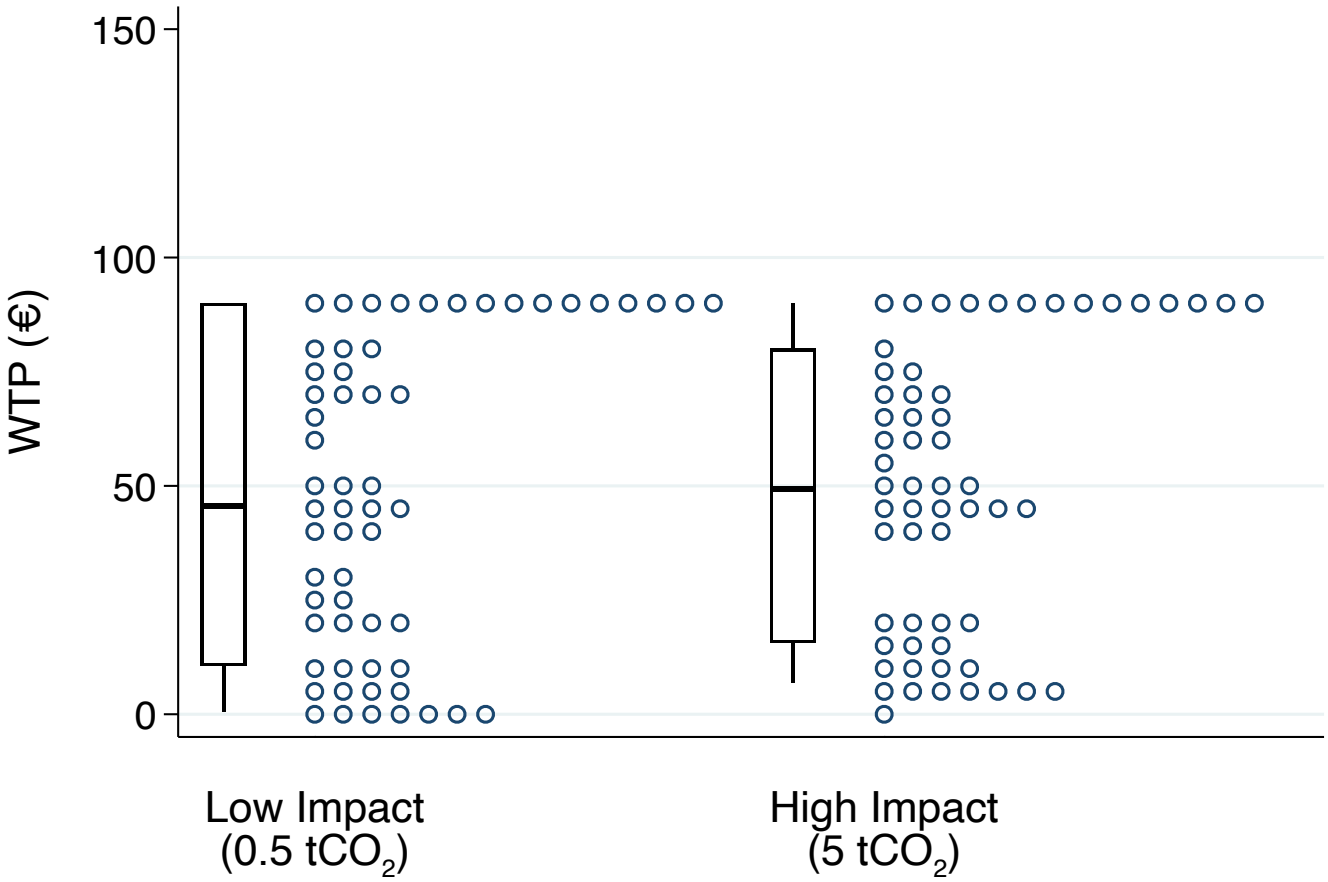


Distribution WTP Main Experimenrt



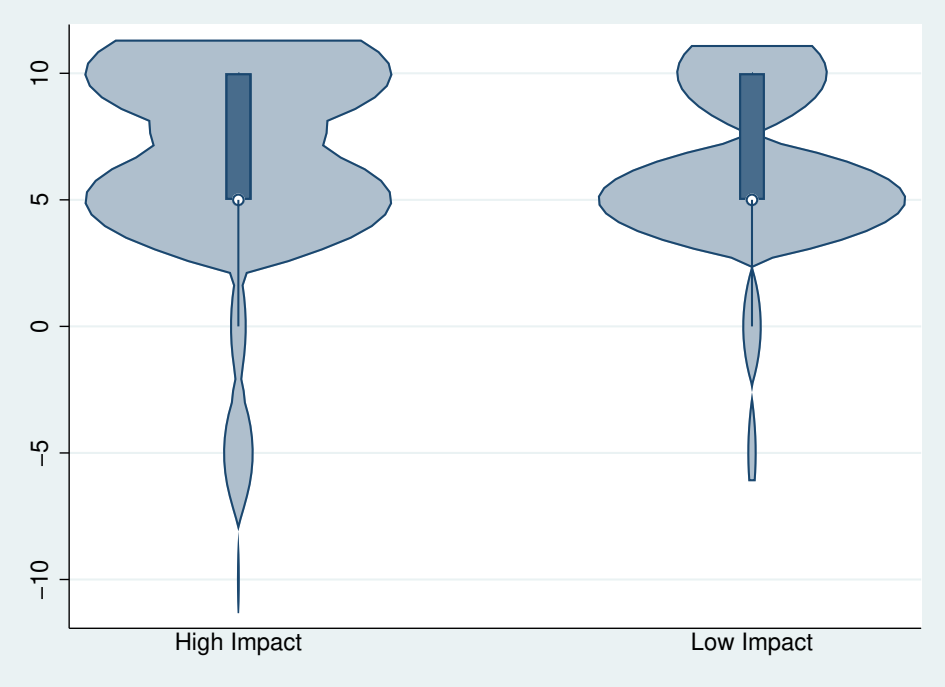
Boxes show 10, 25, 50, 75 and 90 percentiles.

Distribution WTP Impact Investors



Boxes show 10, 25, 50, 75 and 90 percentiles.

Distribution Positive Feeling



Instructions:

In the following, we will provide you with information on **two funds**. The funds are **real funds** which we have anonymized for this study.

We will ask you to **make investment choices** between the two funds for an investment amount of **€1000**, under different conditions.

It is essential for us that you **think about your choices carefully** and **choose according to your preferences**.

You can receive a payout based on your choices:

We will **randomly select ten participants** and make a **real €1000 investment** for each of them, based on their choices.

The **€1000** investment is provided by the research consortium. **After one year,** the total value of this investment is **paid out** to the selected participants.

If you get selected, we determine whether we will invest in your preferred fund. For this, we will use a mechanism that ensures it is **always in your best interest to answer according to your preferences.**

Detailed explanation of the mechanism

The mechanism works as follows:

1. We will determine your willingness-to-pay (WTP) for the fund you prefer based on your choices.
2. We draw a random amount between the highest and lowest WTP that we can detect. When comparing this random amount to your WTP, there are two cases:
   - The random amount is smaller than your WTP. In this case, we will invest €1000 minus the random amount in your preferred fund.
   - This random amount is larger than (or equal to) your stated WTP. In this case, we will invest €1000 in the other fund.

→

Please **carefully study** the following description of Fund 1 and Fund 2:

	Fund 1	Fund 2	
Fund Category	US Small-Cap Growth Equity	US Small-Cap Growth Equity	**Asset class** and **market segment** in which the fund invests.
Annualized Return (3 years)	4%	8%	Average amount **earned** by an investment in the fund each year.
Morningstar™ Risk	Above Average Low Average High	Above Average Low Average High	Assesses the **variations** in a fund's monthly returns, compared to similar funds.

Data retrieved: 15-05-2020

Example Choice:

Please indicate in which fund you prefer to **invest €1000,** given the indicated **up-front fees.**

Invest €1000 minus a **fee of €10** in **Fund 1.**

Invest €1000 minus a **fee of €60** in **Fund 2.**

Explanation:

We will **deduct** the indicated **up-front fees from the €1000** before investing. There are no other costs associated with the investment.

Remenber, there is a **chance** that we will pay you out the **value of an investment** after **one year**. So let's look at the choice on the left in the example above:

Invest €1000 minus a **fee of €10** in **Fund 1.**

Invest €1000 minus a **fee of €60** in **Fund 2.**

The **value** of this investment **after one year** is determined in the following way:

- We will **invest €990** (= €1000 - €10) in Fund 1.
- **After one year,** the value of the investment will be **€990 plus/minus the profits or losses** incurred by Fund 1 over the year.

Comprehension Question:

Let's look at the choice on the right in the example above:

Invest €1000 minus a **fee of €10** in **Fund 1.**

Invest €1000 minus a **fee of €60** in **Fund 2.**

What is the **value** of this investment **after one year**?

€1060

€940

€1060 plus/minus profits or losses of Fund 2 incurred over the year

€940 plus/minus profits or losses of Fund 2 incurred over the year

Profits or losses of Fund 2 incurred over the year

Fund Information:

Please **carefully study** the description of Fund A and Fund B shown below.

	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			Assesses the **variations** in a fund's monthly returns, compared to similar funds.
Climate Change	An investment of €1000 in this fund **saves 500 kg of CO_2** emissions. This corresponds to: • The CO_2 saved by planting **3 trees.** • The CO_2 emissions of traveling **1500 km** by plane. • The CO_2 emissions caused by an EU citizen in **25 days**.	An investment in this fund does not save CO_2 emissions.	Some funds finance projects that **save CO_2 emissions.** Some experts argue that this is a valuable way of how investors can **contribute** to fighting climate change. Other experts argue that this is a **distraction** and may delay the policies needed to fight climate change (e.g., carbon taxes).

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Comprehension Question:

To make sure that you have read the descriptions correctly, please answer the following questions.

Please state whether the following statement is true:

	True	False
Funds A and B have the same Morningstar Risk rating.	○	○

What is the **Annualized Return** (3 years) of Fund A as well as Fund B in **%**?

How many **kg of CO2** does an investment of **€1000** in **Fund A** save?

Investment Decisions:

For the following 7 choices, please indicate in which fund you prefer to **invest €1000**.
Please consider that **we will deduct** the indicated **fees** from the €1000 investment.

	Fund A	**Fund B**	
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			Assesses the **variations** in a fund's monthly returns, compared to similar funds.
Climate Change	An investment of €1000 in this fund **saves 500 kg of CO_2** emissions. This corresponds to: • The CO_2 saved by planting **3 trees.** • The CO_2 emissions of traveling **1500 km** by plane. • The CO_2 emissions caused by an EU citizen in **25 days**.	An investment in this fund does not save CO_2 emissions.	Some funds finance projects that **save CO_2 emissions.** Some experts argue that this is a valuable way of how investors can **contribute** to fighting climate change. Other experts argue that this is a **distraction** and may delay the policies needed to fight climate change (e.g., carbon taxes).

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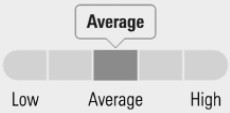
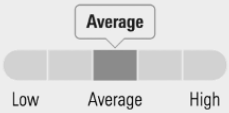
Your Investment Choice 1:

Invest €1000 minus a **fee of €10** in **Fund A**.

Invest €1000 minus a **fee of €10 in Fund B.**

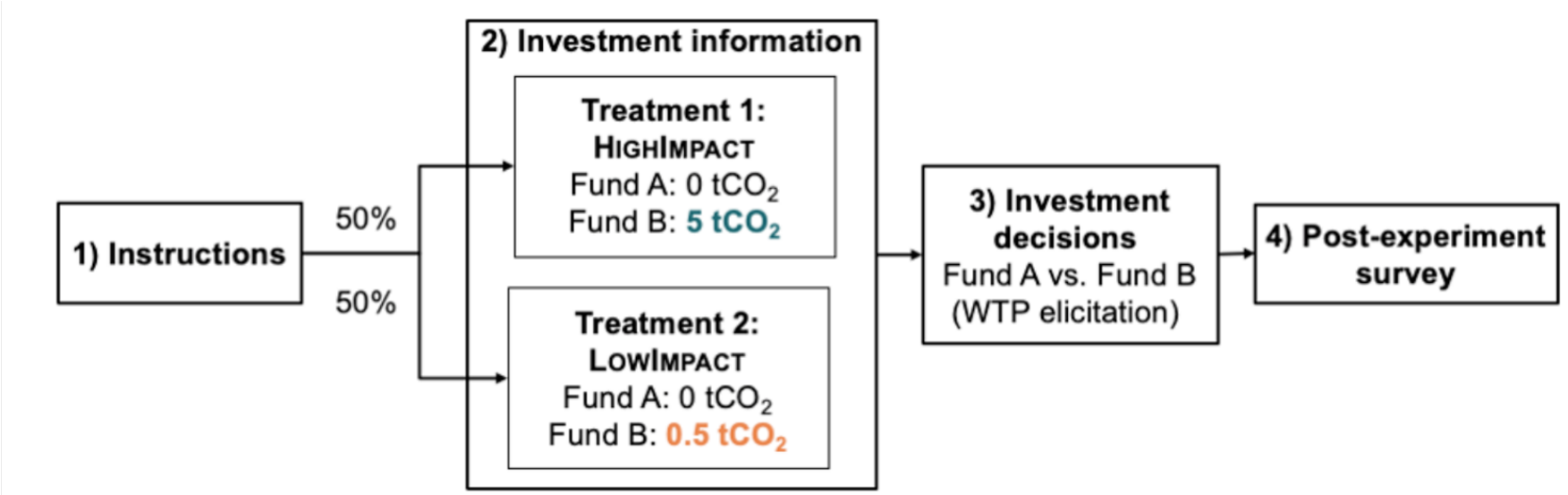
→

Low Impact Treatment

	Fund A	Fund B	
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			Assesses the **variations** in a fund's monthly returns, compared to similar funds.
Climate Change	An investment of €1000 in this fund **saves 500 kg of CO_2** emissions. This corresponds to: • The CO_2 saved by planting **3 trees.** • The CO_2 emissions of traveling **1500 km** by plane. • The CO_2 emissions caused by an EU citizen in **25 days**.	An investment in this fund does not save CO_2 emissions.	Some funds finance projects that **save CO_2 emissions.** Some experts argue that this is a valuable way of how investors can **contribute** to fighting climate change. 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

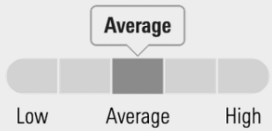
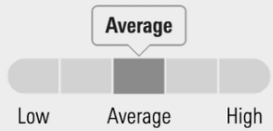
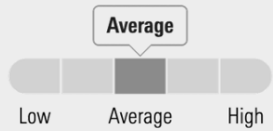
Experimental Design



- WTP measured with fees
- Bi-section method with 7 steps
- Measuring with EUR0.25 precision
- Becker–DeGroot–Marschak mechanism

The Role of Comparability

High Impact Range Treatment

	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.
Annualized Return (3 years)	**6%**	**6%**	**6%**	Average amount **earned** by an investment in the fund each year.
Morningstar™ Risk				Assesses the **variations** in a fund's monthly returns, compared to similar funds.
Climate Change	An investment into Fund A does not save CO_2 emissions.	An investment of €1000 in this fund **saves 500 kg of CO_2** emissions. This corresponds to: • The CO_2 saved by planting **3 trees.** • The CO_2 emissions of traveling **1500 km** by plane. • The CO_2 emissions caused by an EU citizen in **25 days**.	An investment of €1000 in this fund **saves 5000 kg of CO_2** emissions. This corresponds to: • The CO_2 saved by planting **30 trees.** • The CO_2 emissions of traveling **15000 km** by plane. • The CO_2 emissions caused by an EU citizen in **250 days**.	Some funds finance projects that **save CO_2 emissions.** Some experts argue that this is a valuable way of how investors can **contribute** to fighting climate change. Other experts argue that this is a **distraction** and may delay the policies needed to fight climate change (e.g., carbon taxes).

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