Morals in multi-unit markets

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Virtual Market Design Seminar

Introduction

- Debate in social sciences: Do markets erode morals?

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- Do subjects care less about causing negative externalities when trading in markets compared to individual decision-making?

Key finding in Falk & Szech (2013)

Single-unit markets partially erode morals.

- 45.9% of subjects kill a mouse for €10 in individual decision-making, 75.9% do so in markets.

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- Recently, Falk and Szech's findings were challenged: repetition may be responsible for erosion in markets (Bartling et al., 2021); unbalance in proportion of sellers may cause decreasing prices (Sutter et al., 2020).

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Single-unit markets and market power

In single-unit markets, individuals have the power to affect aggregate outcomes!

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Multi-unit markets allow for excuses that are not available in single-unit markets

Spokeswoman for McKesson (2019): "Any suggestion that McKesson influenced the volume of opioids prescribed or consumed in this country would reflect a misunderstanding of our role as a distributor." (McKesson was the largest distributor of opioids in the US from 2006 to 2012).

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- Heterogeneous preferences;
- Desensitization effect: decreasing marginal moral costs.

***Why* might these multi-unit markets be less moral?**

(1) Market selection, price and quantity set by least moral trader:

- Heterogeneous preferences;
- Desensitization effect: decreasing marginal moral costs.

(2) Replacement logic (Sobel, 2010):

- People trade because they feel that otherwise others take advantage of the trading opportunity.

Design

Experimental setup

Trading leads to a negative externality:

- Each unit traded cancels a donation to UNICEF for measles vaccine (Sutter et al. 2020);
- One unit of donation = 4 **doses** of vaccine (2 per person);
- Per unit costs of €1.5;

Experimental setup

Four treatments, between subjects, 381 participants:

1. IDM: Valuation of charity donations in multi-unit MPLs.
2. SINGLE: Single-unit market.
3. MULTI: Multi-unit market with limited capacity.
4. FULL: Full multi-unit market with unlimited capacity.

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Timeline of the experiment:

Experimental setup: morals in individual decision-making

- Valuations reported for 1, 2, 3, 5, 7, 10 and 15 units.
- Donation costs of €1.5 per unit.

Experimental setup: morals in markets

- Fixed groups and roles: 5 sellers & 5 buyers.
- Sequential double auction.
- Varying capacity constraints of traders: single- vs. multi-unit markets.

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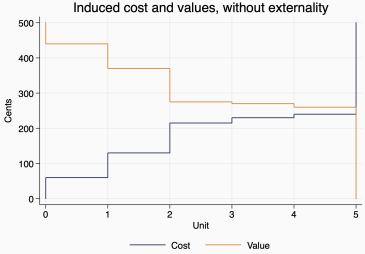
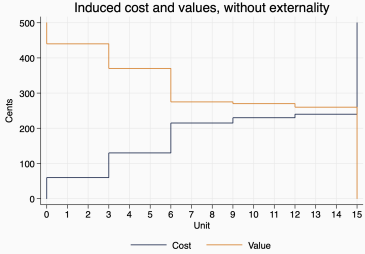
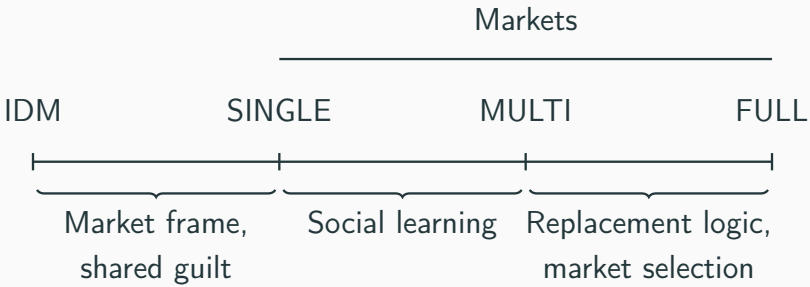
- Fixed groups and roles: 5 sellers & 5 buyers.
- Sequential double auction.
- Varying capacity constraints of traders: single- vs. multi-unit markets.
- Costs of trading: one unit of donation is cancelled per trade.
- Gains from trade: induced costs and values with a common schedule.





Market rules and screenshots

Experimental setup



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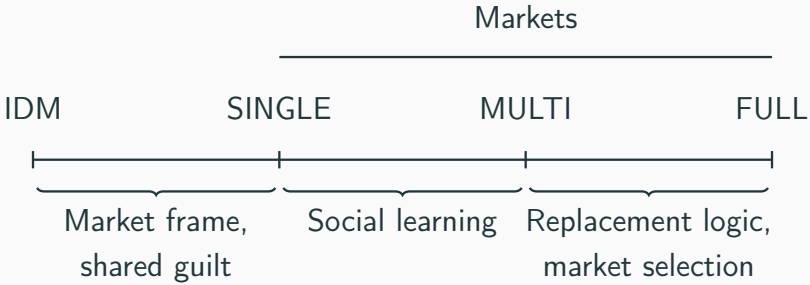

NOTE: The identity of the traders of the least profitable units is used to separate the replacement logic from market selection.

Results

Results: Market selection & heterogeneous preferences

There is quite some variation in our traders' preferences for the charity.

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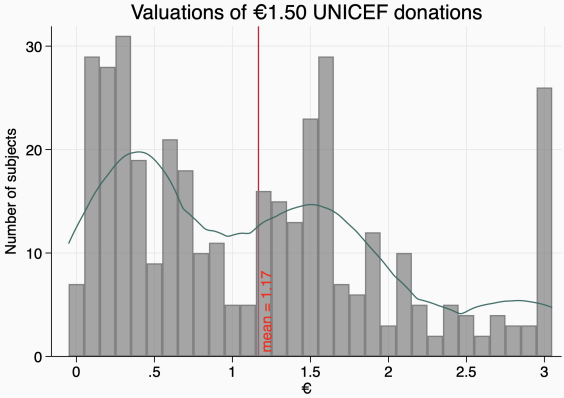

Results: Market selection & desensitization effect

And our traders display decreasing marginal moral cost.

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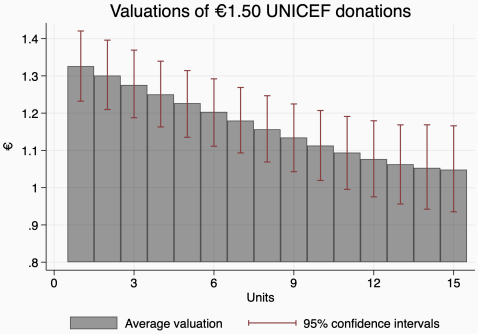

20% average drop in valuation from the 1st to the 15th unit.

Regression evidence

Results: Market outcomes

Benchmarks:

1. Selfish competitive equilibrium

Results: Market outcomes

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2. Competitive equilibrium with moral costs
   - Estimate moral costs for units of €1.5 donation from IDM: $\theta_i(q)$.
   - Combine moral costs with the induced values/costs:

$$v(Q) - \theta_i(q), c(Q) + \theta_i(q)$$

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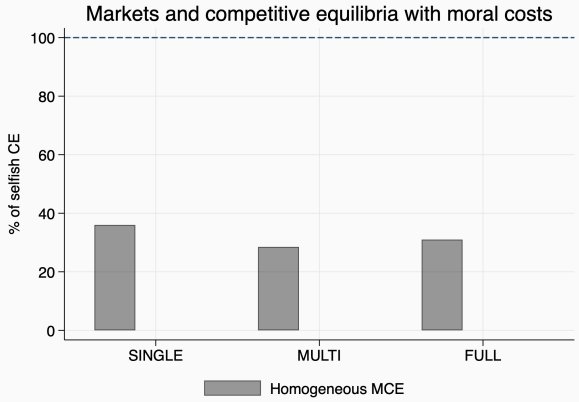
$$v(Q) - \theta_i(q), c(Q) + \theta_i(q)$$

3. Competitive equilibrium with homogeneous and constant moral costs
   - Use median moral costs for the first unit within group.

NOTE: Importance of market selection in the comparison of 2 and 3.

Results: Market outcomes



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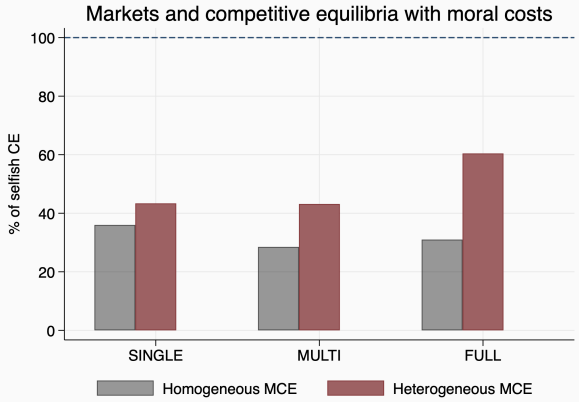

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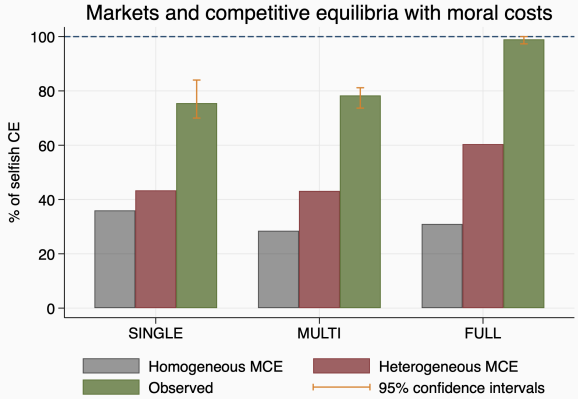

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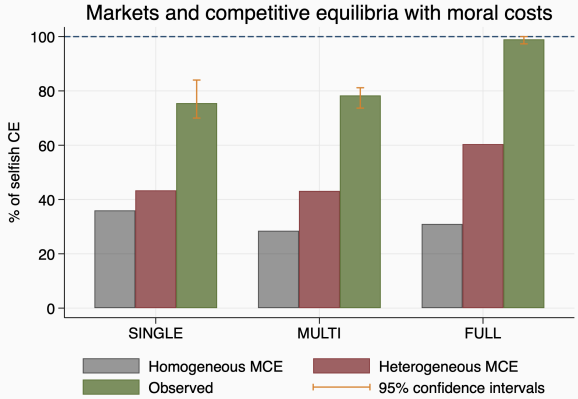
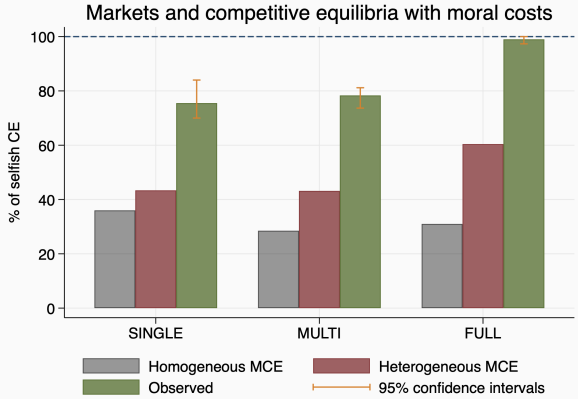


Key result: Erosion of morals in markets

Partial erosion in SINGLE and MULTI, *complete erosion in FULL*.

Results: Market outcomes



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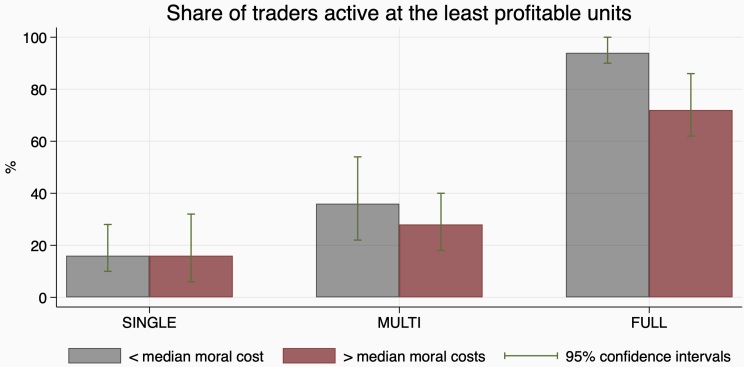
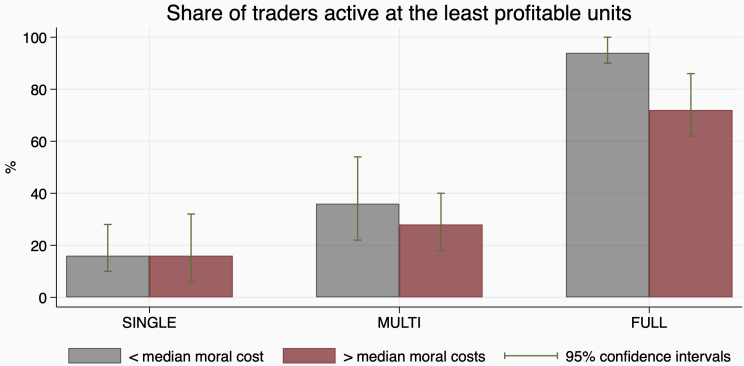
Testing differences | Erosion in single-unit markets

Results: Replacement logic vs. market selection



Median splits by subjects with above and below median moral cost in IDM within their market.
Based on the least profitable units, those yielding a surplus of 20 cents.

Results: Replacement logic vs. market selection



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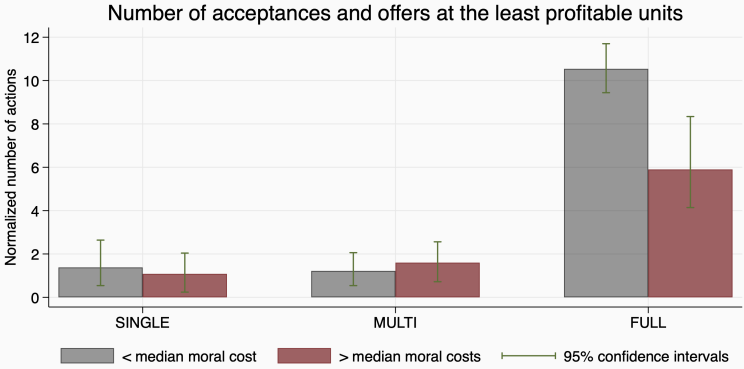
Key force driving complete erosion in FULL

The *replacement logic* justifies trade for a large share of participants.

Results: Replacement logic vs. market selection



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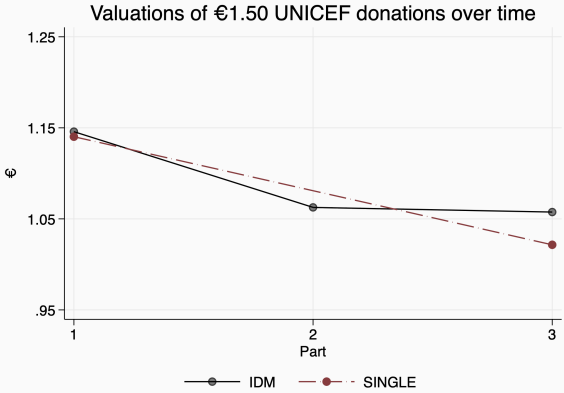
Non-consequentialists

Results: Persistence of erosion beyond the market



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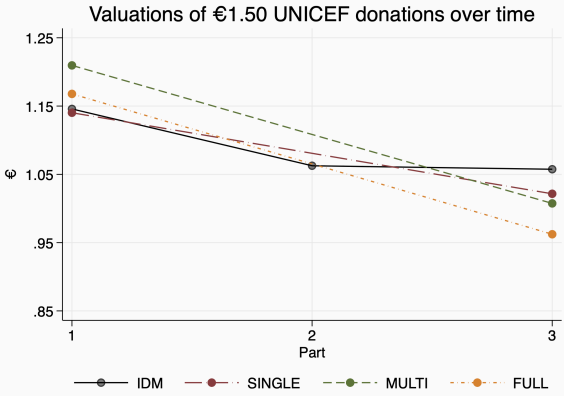

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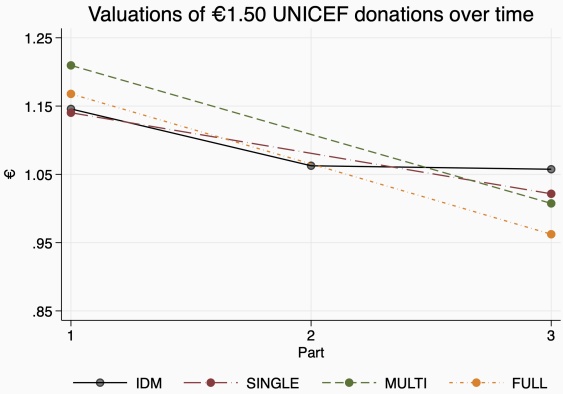
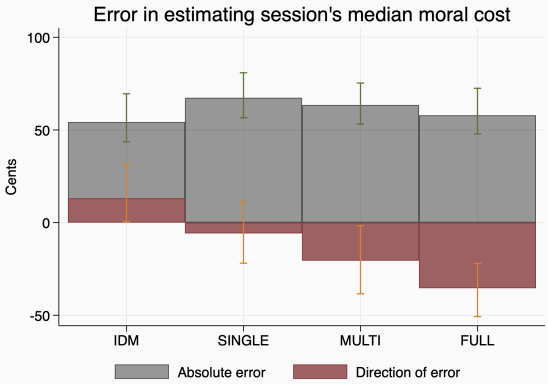


Moral costs decrease over time

The persistence of erosion of moral costs is even stronger in multi-unit markets.

Results: Biased social learning



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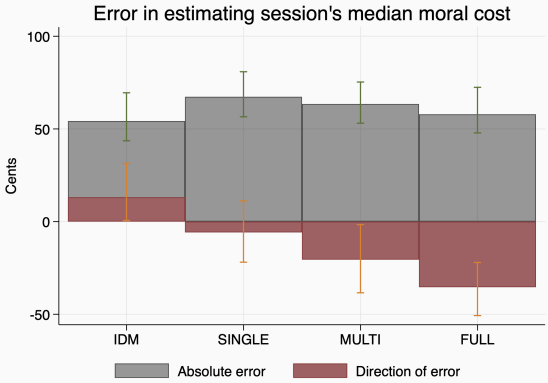
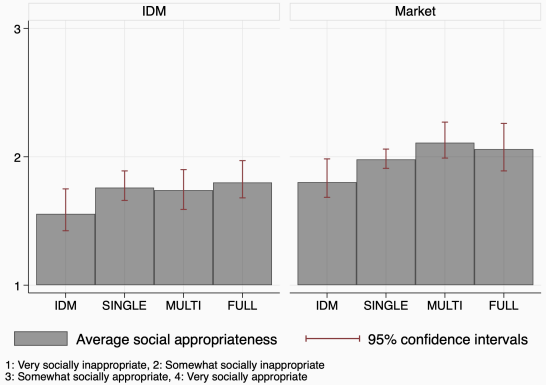


Biased social learning

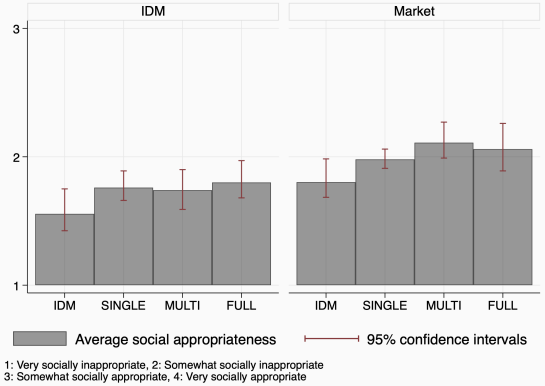
In multi-unit markets participants become too pessimistic about fellow traders' morals.

Results: Are different things socially acceptable?



Social norms (Krupka & Weber, 2013): Is it socially appropriate to cancel a donation of €1.5 when paid €1 in a market/IDM?

Results: Are different things socially acceptable?



Social norms do not differ between markets

The finding that market outcomes are most selfish in FULL cannot be explained by the prevailing social norm.

Conclusion

Markets with the replacement logic let moral people act immorally.

- In the FULL market, traders completely ignore their morals: Even units yielding a surplus of only 20 cents are almost always traded, at a cost of €1.50 to UNICEF.

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- The same people who act morally in individual decision-making forget about their morals in markets where the replacement logic applies: In FULL, only 9% of subjects have moral costs of at most 20 cents (average of part 1 and 3) while in the market 83% of subjects engage in trading that allows a pair to share 20 cents.

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"The level of selfishness displayed on market 2 has almost made me cry during the experiment. Today, my faith in humanity has taken a giant blow."

Thank you!

Appendix

Experimental setup

Sequential double auction, unit by unit:

- It is randomly chosen whether buyers or sellers submit the first offer (14 second time limit).
- Next, the other market side can accept the best offer (lowest ask/highest bid) or submit own offers.
- The starting side can accept, or improve on their previous best offer.
- ...
- If an offer is accepted the two parties trade.
- The market ends when both sides have not improved on their previous offer twice.

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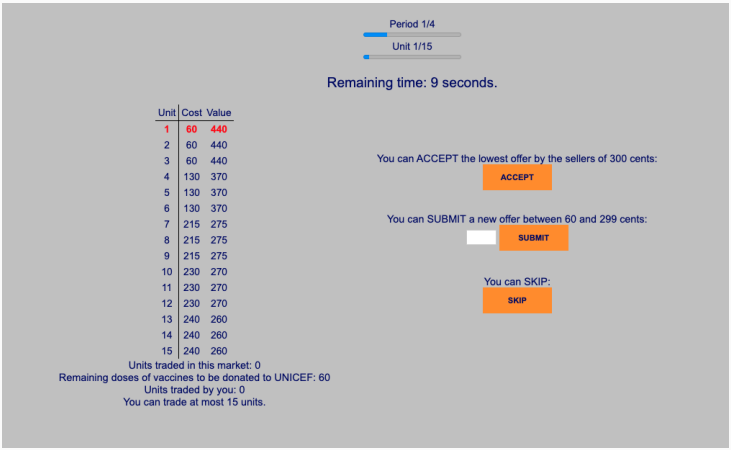
Experimental setup



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Experimental setup

You accepted an offer. You earn 140 cents.

The price agreed upon was 300. The buyer earns 440-300=140 cents, the seller 300-60=240 cents.

Four doses of measles vaccines will not be donated to UNICEF because of this trade. If no more units are traded in this market, 56 doses of measles vaccines will be donated to UNICEF.

In this market period, you have traded 1 unit and earned 140 cents so far.

The market for this trading period has closed, no more units can be traded.

In this period, you traded one unit. You earn 140 cents if this period will be randomly selected for payment.

In the entire market, 1 unit was traded.

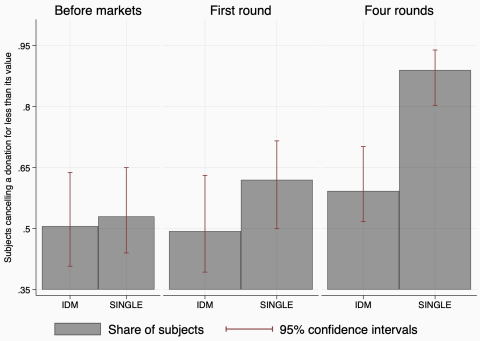
If this period will be randomly selected for payment, 56 doses of vaccine will be donated to UNICEF. Donations for 4 doses have been cancelled in this market.

Back to the presentation

Results: Shared guilt/market frame versus repetition

How do people trade-off money for themselves and money to UNICEF in IDM versus single-unit markets? Fraction of people who:

- In IDM, value a donation less than its monetary value (€1.5).
- In SINGLE, conclude a trade for profit $\leq$ €1.5.



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Results: Market outcomes

		SINGLE	MULTI	FULL
Quantity		75.5%	78.3%	99%
p-values	vs. SINGLE	-	.3800	.0005
	vs. MULTI	-	-	.0001

Using Mann-Whitney U-tests, 10 observations per treatment.

Back to the presentation

Results: Desensitization effect

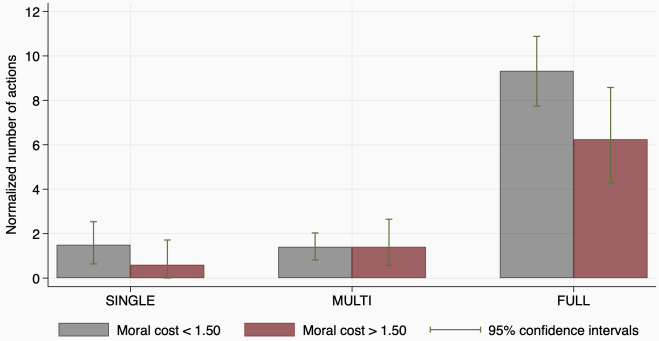
	Marginal moral costs
Unit	-2.076***
	(0.409)
Constant	166.610***
	(3.274)
Observations	5715
# of subjects	381
Subject FE	Yes
Adjusted R^2	0.859

Note: Dependent variable is estimated marginal moral costs. Unit captures the unit number running from 1 to 15. Subject fixed effects control for level differences in moral cost curves across subjects. Standard errors clustered on matching group level in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Back to the presentation

Results: Replacement logic vs. market selection

Even some "non-consequentalist" subjects with moral costs above €1.50 become active in the full market...



Based on the least profitable units, those yielding a surplus of 20 cents.

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