Analysis Plan: Moral in multi-unit markets

Explanation of primary outcomes:

Valuations of charity donations

A. "Moral costs"

In all treatments, this experiment begins by eliciting subjects' valuations of a donation to UNICEF, using multiple price lists. We call the payment a subject requires to be indifferent to a given donation to UNICEF (with varying stakes) the subject's moral costs of canceling this donation. We repeat this elicitation at the end of the experiment, just before eliciting some additional measures of subjects (see: secondary outcomes).

In the market treatments, we infer bounds on subjects' moral costs (in the market) from offers made and (non-)acceptance of existing offers. We can compare individual offers or accepted offers with induced costs and values to obtain an upper bound on moral costs. Offers not accepted and non-offers yield lower bounds on moral costs.

In the control treatment, subjects repeat the individual evaluations of a donation to UNICEF, using the same multiple price lists described above (with varying stakes), for as many periods as there are in the market treatments.

We then compare these moral costs: (i) between subjects (i.e. among three different market treatments and between the markets and the control treatment); and (ii) within-subjects (i.e. comparing moral costs elicited in individual decision making - both before and after the market rounds take place - to the moral costs inferred from market choices).

NOTES:
- If we find changes in moral costs over time in the control treatment, we will correct benchmarks and moral cost changes in the markets by the average moral cost change found in individual decision-making in the corresponding period.
- In estimating moral costs in the markets, we use the quantity sold by each individual to determine her or his individual-level moral costs.

B. "Norm erosion"

As a main measure of moral cost erosion, we fit a second-order polynomial on the available data, as a 'moral cost' curve. We plot, for each individual and on aggregate, the 'moral cost' curve elicited in the initial individual decision-making task and the 'moral cost' curve elicited in the market. We define as "Norm Erosion" the area between the two curves.

To elicit whether potential moral cost erosion in markets persists, we will study the share of subjects who exhibit moral cost erosion compared to the first elicitation of valuations in: i)

the markets, ii) the final round of individual-decision making (which are present in all treatments).

Traded quantities in the markets

We will compare traded quantities (normalized with respect to competitive equilibrium levels) across market treatments. Additionally, we compute several theoretical benchmarks: i) (selfish) competitive equilibrium (i.e. the competitive equilibrium assuming all traders have zero moral costs), ii) socially efficient allocation (i.e. the number of trades that maximize the sum of the payoffs of the traders plus the amount donated to charity), iii) two competitive equilibria with moral costs. For iii), we measure moral costs using the evaluations of the charity donations elicited in individual-decision making and assume additivity between these costs and the induced costs/values. We distinguish a competitive equilibrium with actual and heterogeneous moral costs (iiia), and a competitive equilibrium where it is assumed that all traders have the same median moral costs (iiib). The latter is constructed by calculating the median moral costs of traders on a given market side, then assuming that all traders on a given side are homogeneous and have the same median moral cost. The comparison between (iiia) and (iiib) establishes the effect of heterogeneity of valuations on market outcomes. In cases with potential multiplicity of equilibria (depending on the order of trade), we will use the observed order of trades to predict equilibrium outcomes.

Data analysis

To test hypotheses, we will make use of Mann-Whitney tests. We will perform tests on the aggregate level with averages per matching group as data points (10 data points per market treatment) and we will perform tests at the individual level. If the two tests provide conflicting evidence, we will determine significance in an econometric model with treatment dummies that take into account the panel nature of the data and the dependence within matching groups. When we compare market and individual moral costs, we correct for a general trend observed in the control treatment, if observed in the control treatment.

Hypotheses

This design allows us to test the following hypotheses:

Hypothesis 1: Shared social responsibility and market frame do not matter. For this, we compare the area below the individually elicited moral cost curve and the area below the moral cost curve derived from market behavior in the SINGLE market.

Expected result: Based on previous literature, we expect to reject hypothesis 1 and find moral cost erosion in SINGLE compared to individual decision-making.

Hypothesis 2: Social learning does not matter. For this, we compare the aggregate market quantity in Single multiplied by 3 with the aggregate market quantity in MULTI, as well as the area below the moral cost curve derived from market behavior in the SINGLE and MULTI markets.

Expected result: We expect to reject hypothesis 2, so social learning erodes moral costs. We expect to find higher market quantities and moral cost erosion in MULTI compared to SINGLE.

Hypothesis 3: Replacement logic and heterogeneity in preferences do not matter. For this, we compare the aggregate market quantity in MULTI with the aggregate market quantity in FULL, as well as the area below the moral cost curve derived from market behavior in the SINGLE and MULTI markets.

To decompose replacement logic and heterogeneity of preferences, we compare the proportion of subjects who should not have traded according to their individual moral cost curve in MULTI with the similar proportion in FULL. If the latter is larger, then the replacement logic is activated. We will also study which traders trade the unprofitable units in the market. These are defined as the units for which the monetary profit does not outweigh the traders' moral costs. To establish this, we compare the number of traders displaying moral cost erosion between MULTI and FULL. The identity of the traders of unprofitable units identifies whether the replacement logic or heterogeneity in preferences is driving the results. In the former case, the least moral traders should trade all units. In the latter case, all traders should trade all units. Additionally, we compare the share of traders with above median moral costs trading units deemed unprofitable when incorporating moral costs between MULTI and FULL.

Expected result: We expect to reject hypothesis 3, and expect to find higher market quantities in FULL than in MULTI. We also expect the replacement logic to erode moral costs in the decomposition described above.

Hypothesis 4: The erosion of moral costs is a temporary phenomenon. For this we compare the area below the individually elicited moral cost curve in part 1 and the area below the individually elicited moral cost curve in part 3.

Expected result: We expect not to reject hypothesis 4.

Secondary hypotheses:

Hypothesis 5: Social norms are not affected by market participation: there are no treatment differences in social norms (Krupka & Weber, 2013) between treatments.

Expected result: We expect to reject hypothesis 5. We expect market participation to increase acceptability especially of trading in a market with externalities.

Hypothesis 6: Errors in the beliefs about the median moral cost are constant between treatments. Market participation does not affect the degree to which beliefs are incorrect,

and all three market treatments allow for identical degree of correctness. As a measure, we use the absolute value of the differences between beliefs and actual median choices.

Expected result: We expect there will be two forces at play. On the one hand, multi-unit markets allow for more information about others' moral costs to be revealed, on the other hand, the learning may be biased towards low moral costs due to moral cost erosion and selection effects in multi-unit markets. These two forces counteract each other, hence we do not have a directional prediction for this hypothesis.

Hypothesis 7: Markets without externalities (market 1 in the experiment) converge to competitive equilibrium in all treatments.

Expected result: We expect to confirm hypothesis 7.