OSF **REGISTRIES**

Project IRB Materials ✏️

Embargoed registration   Updates

☰   **Metadata**

This is a component of a registration: Direct Replication of a research claim from Zhang (2009) in Experimental Economics

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This is an update to the original registration

This update was made on Jun 03, 2022

Reason for update:
Slight changes were made to the instructions because test participants were having trouble getting past the attention checks (which require understanding a somehwat complicated auction game that's harder to understand than the typical survey-based experiments they are used to). The new version provides hints on how to compute the values requested in the attention check (rather than just telling them it's wrong and to try again). A new snapshot of the Github has been uploaded to Methods and Materials (available here: https://osf.io/a34v8/).

Study Information   ☰

Hypotheses

The average market price in the UNIFORM treatment is significantly higher than that in the FIXED treatment (Statement 2).

Design Plan

Study type

Experiment - A researcher randomly assigns treatments to study subjects, this includes field or lab experiments. This is also known as an intervention experiment and includes randomized controlled trials.

Blinding

No blinding is involved in this study.

Is there any additional blinding in this study?

Participants will all be playing the game in the UNIFORM condition. Furthermore, they will each be aware of whether they are an informed bidder or uninformed bidder, so it is effectively not a blinded study.

Since the study will be run online, personnel interacting with the subjects will not know what bidder type each subject has been assigned during the experiment.

Study design

This is a cross-sectional study. The market prices observed in an auction game are aggregated over sessions of the experiment and groups of subjects. The average is then compared to a fixed market price using a one sample, two-tailed Wilcoxon signed-ranks test.

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Randomization

Although the original study did randomly assign subjects to different conditions, this replication attempt will only involve the collection of data from a single condition (i.e. the UNIFORM condition).

Sampling Plan

Existing Data

Registration prior to creation of data

Explanation of existing data

No response

Data collection procedures   Updated

Participants will be recruited from an online platform (Amazon Mechanical Turk, or a facilitator like CloudResearch).. The study description will advertise estimated earnings based on the earnings in the original paper (based on OECD Purchasing Power Parities, with slight rounding, we plan to convert the values in

the original study from GBP to USD at 1:1.43, or .01 USD per 175 points in the game instead of .01 GBP per 250 points, so the roughly $24 expected average earnings should be very attractive). Ideally we can limit the sample to current undergraduates to more closely mirror the sample in the original study (p. 211), but this may not be feasible (either way, they will not be from the same institution, which could affect the likelihood of cooperation).

oTree scripts for data collection have been archived here: https://osf.io/a34v8/

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Sample size

To have 90% power to detect 75% of the original effect size, a sample size of 15 groups with 4 subjects each and observed over 20 sessions is required. Thus, the total sample size is 15 4 = 60 participants. To account for dropout in the online setting, the first round of data collection will run until 15 intact groups have completed the experiment (see Missing Data, below). The criteria for replication is an effect in the same direction as the original study and a (two-sided) p-value < 0.05.

If the original result is not replicated in the first data collection, a second round of data collection will be carried out. This round will consist of 16 groups with 4 subjects each and observed over 20 sessions so that the total sample size is 16 4 = 64 participants. Similarly to the first round, data collection will run until 16 intact groups have completed the experiment. If a second data collection is carried out, it will be tested if the original result replicates in the pooled sample of the first and second data collection.

To achieve the target analytic sample, the target sample size for recruitment is 16 groups. If necessary, the second round of data collection will sample an additional 17 groups (potentially more, if attrition in the first round is higher than anticipated), for a pooled recruited sample size of 33 groups.

Sample size rationale

Power calculations were done in accordance with the guidelines of the Social Sciences Replication Project (SSRP). The first round of data collection achieves 90% power to detect 75% of the original effect size. The pooled sample, if necessary after testing the effect on the first round of data, achieves 90% power to detect 50% of the original effect size. The power analysis rationale and R code for this replication can be found here.

Stopping rule

The planned sample size for recruitment is 15 groups with 4 participants each (with an extra group to account for drop-outs or participant "bankruptcy" in the experiment). After achieving that sample, planned analyses will be run. If a significant effect in the hypothesized direction is found, sampling stops. If that significant effect is not found, a second round of data collection will collect data from enough additional groups to reach a pooled sample size of 31 groups (124 participants total). Thus, if all 15 groups in the first round complete the experiment and produce usable data, 16 additional groups will be recruited. Sampling will stop after the second round of data collection regardless of a significant effect.

Variables

Manipulated variables

There are two manipulated variables, bidder types and signals.

The first is bidder type. Of the 4 subjects in each group, 3 will be assigned to be informed bidders, who receive a signal about the market value each round. The remaining 1 subject will be an uninformed bidder. These assignments remain the same for all 20 rounds for each group.

The signal is information provided to informed bidders each round. At the beginning of each round, informed bidders receive a high or low signal, each occurring with a 50% probability. The market value of the security sold in the simulated IPO is 1 plus the number of high signals (and thus has a range of 1-4). The signals and market values of the securities are independently drawn each round. The description of these procedures that will be provided to the subjects is provided in the OSF repository (https://osf.io/6c2v5/).

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Measured variables

The measured variables are the subjects' bids for shares in the simulated IPO. In each round of the experiment, participants submit a schedule of up to 6 bids. Each bid is a combination of price and quantity, and represents the number of shares that a bidder would like to buy at a given price.

Prices can range from 0 to 6 in increments of 0.01.

Quantities are positive integers, and must sum (across bids in a round) to at most 150,000 for informed buyers and 80,000 for uninformed buyers.

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Indices

The key outcome for the finding we will replicate is the market clearing price, which is a deterministic function of all the bids placed by subjects in a group, in a round. The market price (along with the share allocation and profits each round) will be determined as in Zhang (2009):

If the total quantity bid for in the group is less than or equal to the quantity for sale (100,000 units), the market price is set to 0. Each buyer will be allocated the total number of units they bid for.

If the total quantity bid for in the group exceeds the quantity for sale (100,000 units), the goods will be allotted from the highest bidding price to lower prices until all the units are allocated. The market price will be set as the highest price where the total group quantity bid at or above that price exceeds the quantity for sale. The quantity each buyer bid for above the market price will be fully allocated, those below the market price will be ignored, and those at the market price will be allocated proportionately to fully sell the goods (always rounded to integer).

The market price and share allocation determines profits, which are realized immediately and affect the funds available to each buyer for subsequent rounds.

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Analysis Plan

Statistical models

Following Zhang (2009), the unit of observation is the group. The market prices for each group will first be averaged across the 20 rounds of play. The group-level average market prices will be compared to a benchmark of 1.94 (the market price in the FIXED condition in Zhang, 2009) using a one sample, two-tailed Wilcoxon signed-ranks test.

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Transformations

No additional transformations required (see "Indices" for a description of how market prices are derived from bidding schedules).

Inference criteria

Criteria for a successful replication attempt for the SCORE project is a statistically significant effect (alpha = .05) in the same pattern as the original study. For this replication attempt, this criteria is met by a higher average market price for the UNIFORM group as compared to the FIXED benchmark of 1.94.

Data exclusion

Participants will be endowed with \$14 for informed bidders and \$16 for uninformed bidders, which should be enough to avoid bankruptcy. If a member of a group goes bankrupt in the course of play, following Zhang (2009), the entire group will be excluded from the final analysis, but we will report results both with and without the excluded group(s) (see footnote 23 on p. 210).

Missing data

If a subject fails to complete the experiment, the entire group will be excluded from the final analysis, as any group member leaving would affect the course of play for the whole group. Each round of data collection will run until the targeted number of intact groups is obtained. We will report results both with and without the excluded group(s).

Exploratory analysis

No response

Other

Other

References

Zhang, P. (2009). Uniform price auctions and fixed price offerings in IPOs: an experimental comparison. Experimental Economics, 12(2), 202-219.