

Behavioural Economics

Cheap Talk, Fraud, and Adverse Selection in Financial Markets

Group Members

Arnav Singh Aditya Kumar Arman Ganjoo

Research Question(s)

- **How often do sellers make exaggerated or fraudulent claims in an unregulated market where communication is unrestricted, and how often do buyers rely on these statements?**
- **In the absence of communication, what is the degree of adverse selection observed in financial markets, and how do the outcomes differ from those in markets where sellers can engage in fraudulent communication?**
- **Can antifraud rules, which allow sellers to make truthful yet potentially optimistic statements about asset quality, effectively mitigate adverse selection problems and improve market efficiency?**
- **What sort of a penalty rate minimizes false claims by sellers while maintaining market efficiency?**

Utility Functions

****Assumption: All participants are egoists****

Seller's Utility Function

Depends on:-

- The transaction price (P): the amount received if the asset is sold.
- The seller's reservation value for the asset (S_θ): this is the minimum price at which the seller is willing to sell the asset, determined by the quality of the asset (θ).

Buyer's Utility Function

Depends on:-

- The transaction price (P): the amount received if the asset is sold.
- The buyers' reservation value for the asset (B_θ): this is the minimum price at which the seller is willing to sell the asset, determined by the quality of the asset (θ).
- The buyer's endowment (e) before making any transactions

Communication Mechanisms

No Communication

Sellers cannot share any information or signals

Cheap Talk

Sellers send non-binding, costless, and unverifiable communication

Anti-Fraud

Sellers must include can't outright lie, but they can send ambiguous signals

Penalty Method

Sellers are penalized up to $c\%$ of their earnings in a round, for making false claims

For the purpose of the experiment accompanying this project, all gains resulting from changes in utility after a transaction are represented in two 3x2 matrices, one for each player, the buyer and the seller, represented in the following images as row and column players respectively. These matrices are structured to clearly convey the outcomes of each possible action in the game for the corresponding player.

ROW PLAYER								
33%	C1	C2	33%	C1	C2	33%	C1	C2
R1	400	350	R1	700	350	R1	1000	350
R2	150	350	R2	450	350	R2	750	350
R3	0	350	R3	300	350	R3	600	350
Red Table			White Table			Blue Table		

Plays R1, R2 or R3

COLUMN PLAYER								
33%	C1	C2	33%	C1	C2	33%	C1	C2
R1	200	0	R1	200	250	R1	200	500
R2	450	0	R2	450	250	R2	450	500
R3	600	0	R3	600	250	R3	600	500
Red Table			White Table			Blue Table		

Plays C1 or C2

Model

Please Refer to the Whiteboard

Code

- **Used oTree, a Django Based Python Framework to create the experiment**
- **Created 4 Experiments for the 4 Communication Mechanisms our project is testing**
- **Added live pages to communicate with the server continuously and update in real time.**
- **Ensured random group formations and colour allocations.**

Statistical Tests

Efficiency and Adjusted Efficiency:

- We plan to measure the actual gains from trade as a percentage of the maximum possible gains, while adjusted efficiency subtracts gains from trades predicted under adverse selection to isolate the effects of communication mechanisms. We'd also like to plot the degree of false claims in different rounds, based on the value of 'c' in the fourth mechanism

Wilcoxon Test:

- A non-parametric test used to compare efficiencies or adjusted efficiencies between treatments without assuming normality; evaluates whether differences in medians are statistically significant.

t-Test:

- A parametric test used to compare mean efficiencies or adjusted efficiencies across treatments; assumes normality and equal variances (if applicable).

Instructions

Please Refer to the Attached PDF